



OXFORD SPECIALTY TRAINING

BEST OF FIVE MCQs

for MRCPsych Paper 1

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FOREWORD

I am delighted and honoured to be asked to write a foreword for this excellent book.

The authors are to be commended in producing an excellent series of relevant MCQ questions. These will form about 70% of Papers I to III in the revised MRCPsych examination. Many trainees have difficulties with this kind of question – particularly with the harder ones which will only increase in frequency as the examiners struggle to make up new questions with each diet! The MCQs in this volume have the characteristics of being both fair and stretching. Comprehensive and clear answers to these questions with references from easily available, standard text books are included. The whole of the prescribed MRCPsych syllabus has been covered in these questions and answers. The best answer to many questions like this is 'I'll look it up', but this is not a recourse that one can use in exams and this book should help considerably in passing them.

Professor Nicol Ferrier
Newcastle University

ACKNOWLEDGEMENT

This work began with an idea of producing revision aids for new MRCPsych exams. A number of people helped us to conceive, nurture and develop this idea, and transform it to its current physical form.

We are thankful to all those who have taught us and supervised us over the years, imparting curiosity to learn, and to teach psychiatry.

Dr Thambirajah provided the much needed dopamine to our brains' reward areas! In addition he reviewed a few chapters in this series. We are deeply indebted to our other reviewers Dr David Christmas, Dr Niraj Ahuja and Dr Ranjit Krishnadas.

A special thanks to Prof Ferrier for writing the foreword.

Chris Reid, Jo Hardern & Fiona Goodgame from OUP deserve special mention for their patience and perseverance.

Heartfelt thanks to Priya and Sindhu; we could not have seen this book as it is now but for their sacrifice of many relaxing evenings and leisurely weekends!

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CONTENTS

Introduction	1
1 Clinical skills	
Questions	7
Answers	23
2 Core clinical psychiatry	
Questions	39
Answers	59
3 Psychopathology	
Questions	79
Answers	95
4 Psychology	
Questions	113
Answers	127
5 Psychopharmacology	
Questions	147
Answers	159
6 History, social psychiatry, and ethics	
Questions	171
Answers	183
Index	193

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INTRODUCTION

THE MRCPSYCH PAPER 1: TAKING THE BULL BY ITS HORN

MRCPsych exams are the most important exams a psychiatry trainee in the UK will sit during his or her career. Passing the MRCPsych is the most visible of the criteria that demonstrate the achievement of a number of competencies during the training. Since spring 2008, there has been a significant change in the pattern of the exam. The structure, syllabus, and the format of questions have changed significantly.

WHO CAN SIT THE EXAM?

The details are clearly given in the Royal College website. They are summarized below for quick reference. Please note that these are subject to change and so we recommend checking with information at www.rcpsych.ac.uk before you apply.

Training requirements¹

The college has brought out new exam regulations that are to come into effect from January 2009. Candidates must have completed the mandatory training period of 12 months of post foundation training in psychiatry by the date of sitting the written exams. Posts must be part of a programme of training approved by PMETB OR recognised by the Hospital or Trusts as having specific time, programme (journal clubs, grand rounds, teaching, supervision, etc.) and funds allocated for training. Individual posts can be of either 4 or 6 months duration. It could be a 12 month post in adult psychiatry OR a 6 month post in old age psychiatry and a 6 month post of adult psychiatry OR a combination of 4 month posts in adult or old age psychiatry but with a minimum of 6 months in adult psychiatry.

Although the college has taken out the time limit beyond 12 months up to when a person can take the exam, they still recommend certain time frames when these exams can be taken ideally. For paper 1, it is 12-18 months, for paper 2, 18-24 months and for paper 3, it is 18-30 months. Paper 1 and 2 are passed permanently, but the results of paper 3 can be banked only for 635 days. Because the practical exam (CASC) can be sat only after 30 months (even if you pass all the theory exams in 12 months), it would make sense to delay taking the paper 3 after fulfilling the 30 month requirement for CASC. A person can sit the written exam any number of times.

In addition to the above, there are Work place based assessment (WPBA), Annual review of competency progression (ARCP) assessment and sponsorship requirements that have to be fulfilled as part of the training requirement.

WHAT IS PAPER 1?

The MRCPsych Paper I is 3 hours long and contains 200 questions. The paper consists of multiple choice questions (MCQ, 75%) and extended matching items (EMI, 25%).

MCQs are in the 'best of five' (BOF) format. This type of MCQ comprises a question stem of varying length, followed by a list of five options. Candidates should choose the single best option that fits the question stem.

The college has retained the EMI format from the previous pattern in the new format. In the EMIs candidates are initially orientated by being given a theme for each set of EMIs, followed by a lead-in statement explaining what the candidate is being asked to do. This is followed by an option list, set out in a logical order. Finally, the vignettes are given and the candidate is asked to choose one or more best options from the option list.

One mark is given for each correct answer in both MCQs and EMIs. Candidates are advised to attempt all questions. No marks are deducted for incorrect answers.

Topics/syllabus for the Paper I exam

A rough guideline to the syllabus and distribution of questions, as given by the college, is shown in Table 1. The college gives a detailed curriculum of what is expected to be known in each topic, but how much is necessary for Paper I has not been specified. Please refer to www.rcpsych.ac.uk for any changes (which are inevitable with any evolving exam).

HOW TO PREPARE FOR THE EXAM

Preparation for the exam starts the very day the training starts. This should be directed towards gaining the requirements towards sitting the exam, as well as getting a good knowledge of the theories that underlie the principles and practice of psychiatry.

Reading should ideally start on the very first day. It is best to start reading around the cases that a trainee sees on a daily basis at the outpatient clinics and inpatient unit. These cases could be discussed with the supervisor and used for case-based discussions. A good place would be to start with descriptive phenomenology. For example, discuss delusions seen in a patient during a supervision session. In the process, read around delusions from a standard textbook on psychopathology and discuss the different kinds of delusion, the formation of delusion, and differential diagnosis. So by the end of 10 months, the trainee would have covered most of core psychiatry, phenomenology, and psychopharmacology. It will be a good idea to get the timetable and the topics at the local deanery MRCPsych course and read the relevant material before going in for the teaching session. This is particularly relevant for psychology (where we may not get a lot of opportunity to discuss topics with a psychologist).

Table 1 The syllabus and distribution of questions for Paper I²

Content	No. of Questions
History and Mental State	12
Descriptive Psychopathology	24
Cognitive Assessment	10
Neurological Examination	10
Assessment	16
Description and Measurement	6
Diagnosis	12
Classification	8
Aetiology	12
Prevention of Psychological Disorder	6
Basic Psychopharmacology	14
Human Psychological Development	8
Social Psychology	4
Basic Psychological Processes	14
Dynamic Psychopathology	12
Basic Psychological Treatments	8
History of Psychiatry	8

At least 2 to 3 months leading up to the exam should be left for revision. It would be best to create a timetable with the syllabus and curriculum in mind so as not to leave out important topics. Reading during this period should be exam oriented and should be done along with practice multiple choice questions. This could be done on your own or in a study group. Preparing in a group helps to get an idea of where one stands with respect to the knowledge base.

Practice tests

It is best to take a number of mock and practice tests before the exam as these will give a fairly good idea of one's strengths and weaknesses. Unfortunately, since the exam formats have changed recently, it is difficult to get an idea of the college question banks and typical college favourites. A number of privately run revision courses give an opportunity to take mock examinations. It is best not to rely on these courses to learn a lot of theory at the last moment. These courses and materials should only be used to aid revision. But it is best to revise from material the candidate has already read once through the previous 10 months, rather than starting afresh. When selecting a course, it would make sense to choose one that offers a number of mock tests. If not, you could ask your local MRCPsych organizers to set up mock examinations as part of the course. It is best to do mock exams in the same paper and pencil format, using 200 questions; and timing it at 160 minutes.

Books to read

Knowledge does not come from textbooks alone. All kinds of resources are useful, including the internet, but it is best to base the core reading on standard textbooks. These textbooks should form the basis of reading, but reading should not be restricted to these.

The two reference books that we recommend are *Kaplan and Sadock's Synopsis of Psychiatry* (this is an American book, which is comprehensive, with DSM and ICD criteria, and forms excellent reading in psychology and psychopharmacology in addition to basic psychiatry) and the *New Oxford Textbook of Psychiatry*. Both are two volume textbooks.

As for core reading, the *Shorter Oxford Textbook of Psychiatry* is a very good text to begin with. Each chapter is written in an authoritative style and relevant to training in the UK. At the end of each section or topic there is a reference for further reading in the topic, which is invaluable.

Descriptive phenomenology forms the basis of diagnosis in psychiatry. There are two books that give a good account of descriptive phenomenology: *Fish's Clinical Psychopathology: Signs and Symptoms in Psychiatry* by Patricia Casey and *Symptoms in the Mind: An Introduction to Descriptive Psychopathology* by Andrew Sims, and revised recently by Femi Oyebode.

A good introductory textbook for psychopharmacology is Stephen Stahl's *Essential Psychopharmacology: Neuroscientific Basis and Practical Applications*. It is very lucid to read with a number of diagrams which help understanding of the basis of psychopharmacology. The book is also good for Papers 2 and 3.

There are a number of books for basic psychology: *Psychology: Themes and Variations* by Wayne Weiten is especially recommended. It is an American book which is very easy to read with a lot of examples. Thambirajah's *Psychological Basis of Psychiatry* is also a good book, specifically designed for MRCPsych exams.

Paper 1 MRCPsych revision techniques in summary

1. Avoid studying irrelevant details in books and other texts; as they are not tailor-made for the exam.
2. As there is no existing bank of 1000 or 1500 questions to revise and attempt the exam confidently, one should get the basic concepts straight and correct, in order to tackle any surprises.
3. Group study helps in many ways; but make sure your peers are motivated to fully participate in the groups. Nothing can be more unfruitful than three people getting together but studying in isolation.

4. Plan, plan, and plan! Structure your time according to the syllabus you have to revise. Spend equal time reading theory from books and solving BOFs.
5. There is no harm in utilizing all available materials before you attempt your exam – ask your senior ST trainees or colleagues and seek resources from revision courses and local MRCPsych teaching lectures.

APPROACH TO MULTIPLE CHOICE QUESTIONS^{3,4}

The MRCPsych exam is more than reading and understanding the core subject. It has also to do with the technique of attempting best of five MCQs. Unlike the old-style ISQ, the new style is a bit more difficult to do because the chance of getting the answer wrong is 80% compared to 50% with the older style. The very concept of selecting the best answer lies in the fact that there may be more than one right answer, but we need to choose the best answer. In order to do this you get 180 minutes to answer 200 questions that is less than 1 minute to answer a question. This means that the more familiar you are with the concepts, the faster you can answer and you will be able to spend more time on the more difficult and longer questions. It is said that in most medical examinations, candidates who answer half the questions correctly would score around the 50th or 60th percentile. A score of 65% (130/200) would place the examinee above the 80th percentile, whereas a score of 30% (30/200) would rank him or her below the 15th percentile.

Test performance will always be influenced by your test taking skills. Considering various test taking strategies and developing and perfecting them well in advance of the test date can help you concentrate better on the test itself. We recommend you try various techniques to find what works best for you. It should, in the end, help you to:

- increase your reading pace;
- focus on the most relevant information;
- eliminate as many options when you are not sure of the correct answer.

You require enough practice using the techniques so that it becomes second nature and you don't concentrate on anything but how to choose the correct answer when you actually sit the exam.

Timing

Time management is an important skill for exam success. As mentioned above, the test has 200 questions to be answered in 3 hours which leaves about 54 seconds per question. Each time you spend more than 54 seconds on a single question, time should be made up on other questions. Therefore it is essential to practise answering questions within a time limit to avoid pacing errors in the exam. This is where attempting a number of mock exams will help.

Approaching each question

There are several established techniques for tackling multiple choice questions which will help you to find the single best answer choice. One of these is classifying each question as easy, workable, or impossible. The basic aim in doing this is to

- answer all easy questions;
- figure out the answer to all the workable questions in a reasonable amount of time;
- make fast and intelligent guesses on the impossible ones.

Another technique is to read the answer choices first along with the last sentence of the question before reading through the question quickly, so as to extract the most relevant information as well as to consider each of the answer possibilities in the context of the question. This is especially relevant when the question stem is large, for example a case scenario.

Elimination is one of the best tools that can be used in a single best answer multiple choice exam. Excluding the possibility of one answer choice proportionately increases the probability of you choosing the right answer.

Since this is a paper and pencil exam, it is better to answer the questions in order, one by one; this reduces chances of skipping and accidentally marking the wrong question or skipping an item. To avoid these 'frame-shift' errors, answer difficult questions with your best guess, mark them for review, move on and come back to them if you have time at the end.

Random guessing

- There are no negative marks for wrong answers, so no question should be left unanswered.
- A hunch is probably better than a random guess; we also suggest selecting a choice which you recognize over another which is totally unfamiliar to you.
- It is never beneficial to pick random choices unless you are grossly out of time and not answering all the questions, in which case the best bet would be to select a single letter like 'C' and marking the remaining questions with it. It is obvious that in this case the chance of picking the correct answer decreases with more answer choices. It is also believed that MCQ makers prefer to hide the answers either in C or D, the middle-most choices, more often than in the periphery.
- It is also very important to not randomly guess the answers during your study and review sessions as well as the practice test sessions, as it may increase the tendency to do the same for the exam.
- As mentioned before, it is essential to take as many practice tests as possible to try the various techniques and select the ones that give you the best results.
- Use any extra time you might have to recheck your answers. Do not be casual in your review or you may overlook serious mistakes.
- Never give up. If you begin to feel frustrated try taking a 30 second breather. Remember your goals and keep in mind the effort and time you have spent in preparing for the exam compared with the small additional effort you will need to keep your focus and concentration throughout the exam.

Other things to do before the exam

Make arrangements for study leaves as early as possible. It is also important to find out how much private study leave you are entitled to. Make all the necessary swaps on the on call rota. Some deaneries arrange for stay and transport for the exam if there are a number of candidates taking the exam. Application forms should be sent well in time. If there are queries regarding applications, they should be clarified from the college at the earliest.

The day prior to exam, choose a good place to stay near the centre, even if it is expensive. As usual, it is important to get a good night's sleep. A good preparation should make you feel confident.

BOF MCQ exam techniques in summary

1. People who fail in new format exams do so not because they don't know the answer for some questions; it is because they think they know the answer and keep thinking about one question for 5 minutes or so, losing the remaining answers.
2. All questions carry one mark only, no matter how easy or difficult each one is. So why spend all your time on 'difficult ones'?
3. In the large, clinical vignette type of questions you may have many irrelevant details; at the same time you may also have valuable clues to solve the BOF. It is useful to read the last sentence, that is the question, quickly before reading large vignettes fully.
4. People have different styles of approaching BOF. Exclusion technique needs more time than direct answer picking; if your style is one of exclusion, make sure you practise well enough to carry this out faster during the exam.

AFTER THE EXAM

If you have some stamina left at the end of this huge ordeal, it is not a bad idea to start recollecting the questions to form a question bank which will be useful for future candidates. It is best to recollect the questions in the company of a couple of colleagues. It will be a good idea to get the questions

back to the college tutor and this will help to arrange further teaching. This will also help you to prepare for Papers 2 and 3 in future.

READING LIST

General Psychiatry

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006.

Psychopathology

Casey P and Kelly B. *Fish's Clinical Psychopathology: Signs and Symptoms in Psychiatry*. Gaskell, 2007.

Oyebode F. *Sims' Symptoms in the Mind: An Introduction to Descriptive Psychopathology*, 4th edn. UK: Elsevier Health Sciences, 2008.

Psychopharmacology

Stahl SM. *Essential Psychopharmacology: Neuroscientific Basis and Practical Application*, 3rd edn. Cambridge University Press, 2008.

Psychology

Weiten W. *Psychology: Themes and Variations*, 3rd edn. Brooks/Cole, 1995.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005.

History of psychiatry and psychiatric ethics

These topics are not fully covered in most textbooks. It may be useful to seek these topics from revision courses or local MRCPsych teachers. A visit to your local library for the reference books mentioned above may be useful too.

Wishing you all the best with the exams. Yes. Take the bull by its horns now!

¹ <http://rcpsych.ac.uk/PDF/Exams%20Eligibility%20July%202008.pdf>

² <http://rcpsych.ac.uk/exams/about/mrcpsychpaperii.aspx>

³ Bhushan V, Le T. *First Aid for the USMLE Step 1 (First Aid)* (Paperback) McGraw Hill Higher Education; 16Rev Ed edition (1 Jan 2006)

⁴ Princeton Review, Stein M, Hwang G. *Cracking the Boards: USMLE Step 1*, 3rd Edition (Princeton Review Series) (Paperback) Princeton Review; 3 edition (Dec 2000)

- 1. Which of the following is NOT a facilitative message?**
 - A. 'Run on' question
 - B. Self disclosure
 - C. 'I want' message
 - D. Silence
 - E. Interpretation

- 2. A psychiatrist at an early stage of his initial assessment interview asks the patient, 'Can you tell me about your depression?' Which of the following interview techniques is he utilizing?**
 - A. Closed-ended questions
 - B. Open-ended questions
 - C. Reflecting
 - D. Facilitation
 - E. Put down question

- 3. Which of the following is an open-ended question?**
 - A. Tell me about yourself?
 - B. Could you tell me the name of the prime minister?
 - C. It seems as if you feel people are against you?
 - D. What do you find stressful in your job?
 - E. Do you have trouble falling asleep?

- 4. During a clinical interview the following statement is made by the clinician: 'So you have been anxious since these changes occurred at your work place.' Which of the following interview technique best describes the above statement?**
 - A. Facilitation
 - B. Open-ended question
 - C. Closed-ended question
 - D. Interpretation
 - E. Reflecting

5. Which of the following interview techniques is least directive?

- A. Limit setting
- B. Summarizing
- C. Re-direction
- D. Repetitive questioning
- E. Narrow-focused questions

6. Which of the following is a supportive intervention during a clinical interview process?

- A. Open-ended questions
- B. Acknowledgement of affect
- C. Confrontation
- D. Taking a medical history
- E. Summarization

7. Which of the following statements is true when enquiring about suicidal ideation?

- A. This should not be asked unless the patient volunteers information
- B. Asking about suicidal ideation can instil suicidal ideas in a person
- C. A person who intends to attempt suicide will never divulge
- D. Passive suicidal ideas must be enquired further for any plans made
- E. The aim of the assessment is to corner the patient into a disclosure

8. ‘Do you ever hear voices commenting on what you are doing?’ This question is usually asked to ascertain the presence of which one of the following?

- A. Bleuler’s primary symptoms
- B. Schneider’s first-rank symptoms
- C. Command hallucinations
- D. Catatonic symptoms of schizophrenia
- E. Negative symptoms of schizophrenia

9. Regarding the Mini Mental State Examination (MMSE), which of the following statements is true?

- A. The subject is asked to guess the answer if unsure
- B. If a person scores 3 on serial sevens, and scores 4 on spelling WORLD backwards then the score for attention is 3
- C. On the reading test one point is scored if the patient reads ‘Close your eyes’ out loud
- D. Education affects the rate of change of scores in normal and dementia subjects
- E. MMSE scores are not affected by socioeconomic status of a subject

10. Assessment of insight is an integral part of mental state examination in psychiatric practice. Regarding insight, which of the following statements is true?

- A. Patients with schizophrenia will never have insight into their illness
- B. OCD being a neurosis, insight is always intact
- C. Intellectual insight is present when patients' awareness and understanding of their symptoms lead to a change in behaviour
- D. Intellectual insight is the highest level of insight
- E. Loss of insight is similar to the concept of anosognosia in neurological illness

11. A patient with schizophrenia vividly describes how Martians are 'reverse freezing' earth to produce global warming. He stops to ask what you think about this. Choose the best response.

- A. This is a fantastic theory. But I want to know more about this. Tell me, have you ever seen these Martians?
- B. This seems possible but there is no proof for all this. Tell me, have you ever seen these Martians?
- C. This cannot be true. Martians do not exist. Tell me, have you ever seen these Martians?
- D. Tell me, have you ever seen these Martians?
- E. What I think is not so important. I want to know more about what you think of this. Tell me, have you ever seen these Martians?

12. Which one of the following is NOT an advisable first response when a patient discloses past sexual abuse at a clinical encounter?

- A. Postpone discussing the issue
- B. Ask if she wants to say anything more about this now
- C. Ask if she has ever disclosed this to anyone
- D. Ask if she sees a link between this and her current difficulties
- E. None of the above

13. Closed questions are best avoided in which of the following scenarios?

- A. A patient with suspected malingering
- B. A guarded patient not answering spontaneously
- C. A suggestible patient with learning difficulty
- D. A psychotic patient who is actively hallucinating
- E. All of the above

14. Which of the following is the single best question to discern premorbid personality of a patient?

- A. How would you describe yourself?
- B. How would your friends describe you?
- C. What were you like before you became unwell?
- D. If we had met 10 years ago, what sort of person would I be talking to?
- E. None of the above

- 15. Which of the following is not a discriminating question to screen for harmful use of alcohol?**
- A. Have you ever attempted to cut down your drinking?
 - B. Do you get annoyed when people talk about your drinking?
 - C. Have you ever felt guilty for drinking excessively?
 - D. Do you drink every evening?
 - E. Do you need a drink as soon as you wake up?
- 16. A patient looks dishevelled, with unkempt hair and dirty, unwashed clothes. Self neglect is commonly noted in all of the following EXCEPT**
- A. Alcoholism
 - B. Chronic schizophrenia
 - C. Depression
 - D. Dementia
 - E. Social phobia
- 17. A 57-year-old lady with many previous hospitalizations is brought by police to casualty. She is wearing full make-up, green lipstick, shiny green nail polish, and green jewellery. She asks everyone at the admission unit to call her Ms Green. Which of the following diagnoses is most consistent with the above presentation?**
- A. Mania
 - B. Depression
 - C. Panic attacks
 - D. Obsessive compulsive disorder
 - E. Learning disability
- 18. Which of the following domains of cognition is tested by administering Serial Sevens Test?**
- A. Short-term memory
 - B. Attention
 - C. Language
 - D. Registration
 - E. Recall
- 19. A 33-year-old man attending an out-patient clinic turns towards his left and spits out, muttering unintelligibly. He does this act at least three times in half an hour and appears very guarded. This gesture is suggestive of which of the following?**
- A. Depression
 - B. Suicidal thinking
 - C. Low self esteem
 - D. Responding to hallucination
 - E. Acute confusion

20. A depressed patient does not smile or laugh when a joke is shared by a fellow patient. She shows a defect in which of the following aspects of mental state examination?

- A. Stability of affect
- B. Reactivity of affect
- C. Congruence of affect
- D. All of the above
- E. None of the above

21. An elderly patient in a stroke ward laughs all of a sudden inappropriately, and within a few minutes becomes tearful and cries for no reason. She exhibits an abnormality in which of the following aspects of mental state examination?

- A. Stability of affect
- B. Reactivity of affect
- C. Congruence of affect
- D. All of the above
- E. None of the above

22. Which of the following is the major difference between mood and affect in mental state examination?

- A. Mood is short-lived while affect is longer lasting
- B. Mood is objective while affect is subjective
- C. Affect is transient but difficult to interpret
- D. Affect is transient and self reported
- E. None of the above

23. Nihilistic delusions will be congruent with which of the following findings of mental state examination?

- A. Depression
- B. Mania
- C. Depersonalization
- D. Grandiose delusion
- E. None of the above

24. When eliciting suicide risk, which of the following questions should be avoided if possible?

- A. Do you have any plans to kill yourself?
- B. How are you feeling in your mood?
- C. Have you ever considered life is not worth living?
- D. Have you ever wanted to go to sleep and never wake up?
- E. None of the above

25. Which of the following is not a manifestation of hypothyroidism?

- A. Hypothermia
- B. Sparing of the posterior column sensations
- C. Dementia
- D. Cerebellar ataxia
- E. Loss of deep tendon reflexes

26. Russell's sign is usually associated with which one of the following disorders?

- A. Schizophrenia
- B. Bipolar disorder
- C. Bulimia nervosa
- D. Panic disorder
- E. Somatization disorder

27. On physical examination, you notice that a person with a history of substance misuse now has pilo-erection, dilated pupils, rhinorrhea, and he is yawning frequently. Withdrawal from which of the following substances can cause this presentation?

- A. Cocaine
- B. Opiate
- C. Cannabis
- D. Alcohol
- E. Amphetamine

28. A 50-year-old patient was brought to the A and E department in a confused state. On physical examination he has nystagmus, ocular palsy, and ataxia. Which of the following parts of clinical assessment is likely to be most relevant to this presentation?

- A. Past psychiatric history
- B. Assessment of insight
- C. Alcohol use history
- D. Developmental history
- E. Family history of dementia

29. An 18-year-old male, recently started on a medication, presents to the A and E department with slow, long-sustained, contorting, involuntary movements and postures involving proximal limb and axial muscles. Which of the following medications is most likely to cause the above presentation?

- A. Propranolol
- B. Diazepam
- C. Risperidone
- D. Procyclidine
- E. Sertraline

30. A 21-year-old female presented to the emergency department with complaints of recurrent attacks of severe dizziness, lasting for 10 to 20 minutes. On examination during the episode of dizziness, there was no evidence of nystagmus. Which one of the following is true?

- A. Her symptoms may be associated with fear of going to places from where escape is impossible
- B. Deafness is usually present
- C. Vertigo without nystagmus is suggestive of central vertigo of brainstem origin
- D. Antihistaminic medications are likely to be effective in this case
- E. None of the above

31. A sudden onset of chorea is least likely in which of the following conditions?

- A. Hyperthyroidism
- B. Hypoparathyroidism
- C. Pregnancy
- D. Hypernatremia
- E. Huntington's disease

32. Which of the following is NOT a feature of subacute combined degeneration of the spinal cord?

- A. Loss of pain and touch
- B. Sensory ataxia
- C. Loss of bladder tone
- D. Hyper-reflexia
- E. Absence of reflexes

33. Which of the following physical symptoms is seen in factitious disorder?

- A. Unexplained bleeding
- B. Recurrent hypoglycaemia
- C. Grid iron abdomen
- D. Haemoptysis
- E. All of the above

34. A man admitted to the psychiatric intensive care unit with a manic episode, received 10 mg of haloperidol intramuscularly as he had turned violent. He became unresponsive shortly afterwards. On examination, there is evidence of confusion, labile BP, hyperthermia, rigidity, and dysphagia. What is the most important differential diagnosis?

- A. Acute dystonia
- B. Neuroleptic malignant syndrome
- C. Tardive dyskinesia
- D. Akathisia
- E. Parkinsonism

35. Which of the following questionnaires is used to identify psychiatric 'caseness' in the general population

- A. MMPI
- B. HDRS
- C. GHQ
- D. YMRS
- E. Repertory Grid

36. Characteristic feature of Argyll Robertson pupil include all of the following EXCEPT

- A. Light near dissociation
- B. Irregular pupil
- C. Miosis
- D. Iris atrophy
- E. Flynn phenomenon

37. Thunderclap headache is highly suggestive of which one of the following?

- A. Subarachnoid haemorrhage
- B. Migraine
- C. Cluster headache
- D. Temporal arteritis
- E. Tension headache

38. Waddling gait is characteristic of which of the following neurological difficulties?

- A. Proximal muscle weakness
- B. Hemiplegia
- C. Cerebellar lesions
- D. Sensory ataxia
- E. Astasia abasia

39. A 59-year-old man has a small, spastic tongue with significant difficulty in pronouncing consonants. On neurological examination, he has a brisk jaw jerk. Which of the following is the most likely explanation for the above presentation?

- A. Bulbar palsy
- B. Pseudobulbar palsy
- C. Myasthenia gravis
- D. Extrapyramidal dysarthria
- E. Dysphonia

- 40. When mimicking the use of a screwdriver a patient rotates his arm at the shoulder but fixes his elbow.Which of the following could be diagnosed with the above presentation?**
- A. Ideational apraxia
 - B. Ideomotor apraxia
 - C. Limb kinetic apraxia
 - D. Conduction apraxia
 - E. Conceptual apraxia
- 41. A patient is asked to prepare a sandwich in order to test her ability to perform a sequence of acts.This test is aimed at demonstrating which of the following?**
- A. Ideational apraxia
 - B. Ideomotor apraxia
 - C. Limb kinetic apraxia
 - D. Conduction apraxia
 - E. Conceptual apraxia
- 42. Syndrome of isolated loss of auditory comprehension and repetition, without any abnormality of speech, naming, reading, or writing is suggestive of which of the following?**
- A. Pure word deafness
 - B. Wernicke's aphasia
 - C. Broca's aphasia
 - D. Anomic aphasia
 - E. Transcortical aphasia
- 43. A well-educated solicitor develops a sudden cerebrovascular deficit which results in loss of ability to read or write, though he is able to speak reasonably well.The dysfunction produced by the ischaemia is called**
- A. Alexia with agraphia
 - B. Alexia without agraphia
 - C. Transcortical aphasias
 - D. Global aphasia
 - E. Wernicke's aphasia
- 44. Which of the following is NOT a feature of upper motor neurone lesion?**
- A. Hyper-reflexia
 - B. Hypertonia
 - C. Loss of voluntary movement
 - D. Normal muscle bulk
 - E. Fasciculations

- 45. A 65-year-old patient has been drinking nearly 80 units of alcohol a week for the last 13 years. He has numerous physical complications of alcohol use including cirrhosis and cerebellar degeneration. Which of the following is NOT a feature of cerebellar dysfunction?**
- A. Positive Romberg's sign
 - B. Positive finger nose test
 - C. Positive heel shin test
 - D. Dysdiadochokinesia
 - E. Pendular knee jerk
- 46. In a road traffic accident, a 34-year-old man sustains crush injury of the spine. One half of his spinal cord is damaged severely at the level of the tenth thoracic vertebra. Which of the following is a feature of hemisection of the spinal cord?**
- A. Contralateral weakness
 - B. Contralateral loss of pain sensation
 - C. Contralateral loss of proprioception
 - D. Ipsilateral loss of temperature sensation
 - E. The sensory level is at the same level as the lesion (T_{10})
- 47. A patient presents in an agitated state with increased sweating and tremors. On examination she has signs of Grave's disease. Which is the commonest sign noted in thyroid ophthalmopathy?**
- A. Lid lag
 - B. Lid retraction
 - C. Compressive optic neuropathy
 - D. Diplopia
 - E. Conjunctival congestion
- 48. Headache associated with ipsilateral nasal congestion, rhinorrhea, lacrimation, redness of the eye is characteristic of which of the following?**
- A. Classical migraine
 - B. Tension headache
 - C. Cluster headache
 - D. Headache secondary to depression
 - E. Temporal arteritis
- 49. Epilepsy associated with learning disability, shagreen patches, and ash leaf macules are seen in which of the following?**
- A. Epidermal nevus syndrome
 - B. Tuberous sclerosis
 - C. Neurofibromatosis
 - D. Sturge–Weber syndrome
 - E. Fabry's disease

50. Parkinsonian features associated with downward gaze palsy and pseudobulbar dysarthria is characteristic of which of the following conditions?

- A. Multisystem atrophy
- B. Idiopathic Parkinson's disease
- C. Drug-induced parkinsonism
- D. Progressive supranuclear palsy
- E. Corticobasal degeneration

51. All of the following conditions that affect the trigeminal nerve present with significant sensory loss EXCEPT

- A. Multiple sclerosis
- B. Trigeminal neuralgia
- C. Acoustic neuroma
- D. Meningioma
- E. Neurofibroma

52. Which of the following is a cause of bilateral facial nerve palsy?

- A. Systemic lupus erythematosus
- B. Sarcoidosis
- C. Guillain–Barré syndrome
- D. Wernicke–Korsakoff syndrome
- E. All of the above

53. A patient known to have bipolar illness is on lithium. Which of the following will prompt you to check his lithium levels?

- A. Delayed ankle jerk
- B. Rising serum creatinine
- C. Dysarthria
- D. Fine tremor
- E. Alopecia

54. Which one of the following is a physical sign noted in anorexia nervosa?

- A. Lanugo hair
- B. Grey hair
- C. Brown hair
- D. Alopecia areata
- E. Thickened, coarse hair

55. Sleep spindles and K complexes on electroencephalogram (EEG) are seen in which of the following phase of sleep?

- A. REM phase
- B. Stage 1 NREM phase
- C. Stage 2 NREM phase
- D. Stage 3 NREM phase
- E. Stage 4 NREM phase

- 56. Electroencephalogram (EEG) is a commonly used diagnostic test. Which of the following statements regarding EEG is NOT correct?**
- A. EEG signals are generated by the cerebral cortex
 - B. EEG depends on afferent inputs from subcortical structures, including the thalamus and brainstem reticular formation
 - C. Alpha rhythm and sleep spindles are produced by thalamic activity
 - D. Diagnostic EEG does not routinely record the activity of inferior temporal cortex
 - E. EEG changes are often very specific to a disease
- 57. A 32-year-old school teacher is admitted for constipation and acute abdominal pain. She experiences visual and tactile hallucinations with intense anxiety. She develops motor weakness of her legs on administration of hypnotics and diclofenac. Which of the following laboratory tests is indicated?**
- A. Serum lipid levels
 - B. Serum folate
 - C. Urine glucose
 - D. Urine porphyrins
 - E. Serum ceruloplasmin
- 58. Which of the following is NOT helpful in differentiating pseudoseizures from true epileptic seizures?**
- A. Asymmetric movements of limbs and side-to-side movement of the head during ictal activity
 - B. Raised postictal prolactin levels
 - C. Ictal EEG
 - D. Long-lasting seizures that wax and wane over time
 - E. Having an established diagnosis of epilepsy in the past
- 59. Clozapine is strongly associated with fatal agranulocytosis. Which of the following is true regarding clozapine-induced agranulocytosis?**
- A. The risk of agranulocytosis is greatest in the first year
 - B. Patients must have weekly blood tests throughout clozapine treatment
 - C. After a year blood tests can be discontinued
 - D. An amber report from the monitoring body indicates that clozapine should be stopped immediately
 - E. A red alert indicates that clozapine could be restarted in a patient who previously had an amber report
- 60. Which one of the following statements regarding the dexamethasone suppression test is FALSE?**
- A. Healthy subjects show cortisol suppression on dexamethasone administration
 - B. Depressed patients show more cortisol suppression than normal controls
 - C. The test has a specificity around 25% to 40% for diagnosing depression
 - D. Patients with a positive test may respond better to ECT than those with a negative test
 - E. Dexamethasone suppression is not routinely used as a clinical test for depression

- 61. Which of the following is an advantage of using CT scan over MRI scan for diagnostic purposes?**
- A. Finer details are seen easily with CT scan
 - B. Absence of radiation exposure in CT scan
 - C. CT scan is more suitable in pregnant women
 - D. CT scan is more immediately available in emergencies
 - E. Anterior fossa is better visualized with CT scan
- 62. Choose one of the following conditions where CT scan of brain is the investigation of choice**
- A. Subarachnoid haemorrhage
 - B. Demyelinating disease
 - C. Meningeal neoplasm
 - D. Viral meningitis
 - E. Ischaemic infarction of cortex
- 63. A patient with bipolar disorder recently stabilized on medications is brought to you with a history of fever for 4 days and blurred vision, muscle fasciculation, hyperactive tendon reflexes, and persistent nausea and vomiting for the last 2 days. Which one of the following may be implicated?**
- A. Haloperidol
 - B. Lithium
 - C. Valproate
 - D. Clonazepam
 - E. Carbamazepine
- 64. A patient who has chronic schizophrenia is on a depot antipsychotic medication. Your consultant asks for an ECG. Which of the following will be of most interest to him?**
- A. PR interval
 - B. RR interval
 - C. U waves
 - D. QT interval
 - E. Axis of heart
- 65. Which of the following medications has the highest propensity to cause QT prolongation on ECG?**
- A. Thioridazine
 - B. Risperidone
 - C. Quetiapine
 - D. Haloperidol
 - E. Olanzapine

- 66. A patient who is on olanzapine for a long time is developing xanthoma. Which one of the following levels might be elevated in his blood?**
- A. Creatinine
 - B. Carotene
 - C. Cholesterol
 - D. Glucose
 - E. Albumin
- 67. Which of the following nutrients, if deficient, can make treatment of depression difficult?**
- A. B₁₂
 - B. Riboflavin
 - C. Nicotinamide
 - D. Folate
 - E. Magnesium
- 68. Which of the following is a good predictor of metabolic side-effects of antipsychotics?**
- A. QT interval
 - B. Lipid levels
 - C. HbA1c
 - D. Waist circumference
 - E. Ear lobe thickness
- 69. In patients with suspected dementia, which of the following neuroimaging modalities is clinically helpful to differentiate dementia of Lewy body type from Alzheimer's dementia?**
- A. CT scan
 - B. Structural MRI scan
 - C. Functional MRI scan
 - D. Dopamine transporter SPECT scan
 - E. PET scan
- 70. Which of the following EEG rhythms has the highest frequency?**
- A. Beta
 - B. Theta
 - C. Alpha
 - D. Delta
 - E. Mu

- 71. In patients with delirium due to hepatic failure which of the following EEG change may be seen?**
- A. Hypsarrythmia
 - B. Spike and wave pattern
 - C. Periodic complexes
 - D. Sleep spindles
 - E. Slow triphasic waves
- 72. Which of the following suggests a successful seizure activity after ECT?**
- A. Ictal facilitation
 - B. Postictal suppression
 - C. Ictal suppression
 - D. Dominant alpha waves
 - E. See-saw pattern
- 73. In neurological examination, which of the following is seen in hypothyroidism?**
- A. Hypertonia
 - B. Loss of deep tendon reflexes
 - C. Slow and sluggish deep tendon reflexes
 - D. Clonus on testing deep tendon reflexes
 - E. Exaggerated jaw jerk
- 74. Which one of the following patients is not suitable for undergoing MRI investigation when required?**
- A. A 32-year-old woman with last menstrual period 3 months ago
 - B. A 74-year-old man with suspected Lewy body dementia
 - C. A 53-year-old man with a cardiac pacemaker inserted 10 years ago
 - D. A 44-year-old lady with a family history of haemochromatosis
 - E. A 22-year-old man with epilepsy and mild learning disability
- 75. Which of the following is the most clinically useful method of diagnosing Alzheimer's disease?**
- A. Clinical interview
 - B. CT scans
 - C. Functional MRI
 - D. SPECT
 - E. Lumbar puncture

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1.A. Questions used in clinical interviews can be either facilitative or obstructive. Facilitative messages help the interview to flow, establish a rapport and gain the confidence of the patient. For example, open-ended questions, facilitating statements, reflections, silence, interpretations, positive reinforcements, etc. Run on or polythematic questioning refers to the process of asking the patient a number of questions at the same time. For example, 'Have you felt high in spirits, gone on spending sprees and made foolish investments in the past week?' These questions can be obstructive. Self disclosures are statements about oneself (the psychiatrist) that may help establish a rapport with the patient. I want messages are generally used when the interview fails to progress because the patient is stuck on the same topic. In this case, the psychiatrist could say politely that he or she wants to move on to other topics.

Hales R and Yudofsky SC, eds. *The American Psychiatric Publishing Textbook of Clinical Psychiatry*. American Psychiatric Press, 2003, pp.166–171.

2.B. Open-ended questions reflect a topic that the psychiatrist may want to explore, but leaves it open to the patient to say what he/she thinks is important. These questions are used to start the interview and, later on, can lead to specific closed-ended questions. Put down questions are where the underlying message is a criticism. For example 'How can you complain when you have got an A grade in your GCSE?' Facilitation statements encourage the patient to continue along a particular line of thought. For example, statements such as 'Go on'; 'Proceed'; 'What else' are facilitation statements.

Hales R and Yudofsky SC, eds. *The American Psychiatric Publishing Textbook of Clinical Psychiatry*. American Psychiatric Press, 2003, pp.166–171.

3.A. A question whose answer cannot be a simple yes or no, or a single factual answer that can be classified as right or wrong, is an open-ended question, such as the question given in 3.A. (See also Question 2).

Kay J and Tasman A. *Essentials of Psychiatry*. John Wiley & Sons, 2006, p. 44.

4.E. Reflections are statements where the psychiatrist repeats what the patient has just said. This gives an opportunity to correct one's understanding of what the patient said and to let the patient know that the clinician is listening and trying to understand the situation the patient is in. Interpretations are inferences reached by examining patterns of behaviour or thoughts expressed at a clinical interview.

Hales R and Yudofsky SC, eds. *The American Psychiatric Publishing Textbook of Clinical Psychiatry*. American Psychiatric Press, 2003, pp.166–171.

5. B. Directiveness in the interview ensures that a clinician has all the information needed from a patient. Highly directive intervention aims to focus and restrict the patient's speech content and behaviour. These may include check lists or yes/no questions. Limit setting and redirection include situations where a clinician attempts to change the direction of the interview, especially when the interview is not progressing in the detail of information transferred.

Kay J and Tasman A. *Essentials of Psychiatry*. John Wiley & Sons, 2006, p. 44.

6. B. Being empathetic and acknowledging a patient's emotional state helps in facilitating progression of clinical interview. These are supportive interventions required in various degrees by patients. Summarization is not an intervention but a technique facilitating a clinician's understanding of a patient's story. Confrontation may be helpful in some situations, but it cannot be considered as a supportive intervention during clinical interview.

Kay J and Tasman A. *Essentials of Psychiatry*. John Wiley & Sons, 2006, p. 44.

7. D. Thoughts of self harm should always be enquired about. Contemplation of suicide is very common among the mentally ill. There is no evidence that enquiring about suicidal ideations increases the risk of committing suicide. In fact many patients would welcome an opportunity to discuss any suicidal thoughts with a professional.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 45.

8. B. First rank symptoms (FRS), proposed by Kurt Schneider, suggest a diagnosis of schizophrenia. These symptoms are not specific for schizophrenia. The prevalence of FRS in schizophrenia ranges from 28% to 72%. First rank symptoms do not carry any prognostic significance. The stated question in this case enquires for the presence of 'running commentary' hallucinations – voices commenting on patients' thoughts or actions. Bleuler's primary or fundamental symptoms consist of loosening of association, blunting of affect, ambivalence, and autism (the four A's). All delusions and hallucinations were classed as secondary symptoms according to Bleuler. Negative symptoms include alogia, affective flattening, avolition, apathy, anhedonia, asociality, and attentional impairment.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 179.

9. A. While administering the MMSE, the subject is asked to guess the answer if he is unsure. This could possibly differentiate patients with pseudodementia who usually answer 'I don't know' while truly demented patients often give wrong responses. On the attention subtest, initially the patient is asked to do the serial seven. If the score is less than 5, we do the WORLD backwards. The higher score among the two is taken. It is not enough for the patient to read the sentence out loud. It is a test of comprehension, so the patient needs to close his/her eyes after reading the command. Education affects the scores on the MMSE. Patients with higher educational status tend to score higher on the test. But education does not affect the rate of change of scores in both normal and dementia subject, and hence change in scores is a good index of worsening dementia. MMSE is not independent of socioeconomic status. This may be because socioeconomic status is indirectly linked to educational status.

Ridha B and Rossor M. The Mini Mental State Examination. *Practical Neurology* 2005; **5**: 298–303.

10. E. The three dimensions of insight proposed by David include: the ability to label unusual experiences as pathological, to recognize that one has mental illness, and to comply with treatment. In a different approach to the concept of insight, emotional insight is considered the highest level of insight. This is the awareness and understanding of the illness which leads to a change in behaviour. Intellectual insight is the admission of illness and recognition of symptoms, without the ability to apply this knowledge to change or shape future behaviour. Patients with OCD may present with poor insight. DSM IV has a specifier 'with poor insight' for OCD where poor insight is associated with poor prognosis. Patients with schizophrenia show variable levels of insight at various stages of their illness. Some exhibit a good level of insight when recovered, while at the worst phase of their illness they may deny having any mental illness.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 241.

11. E. Option A and B indicate collusion with the patient's belief. Option C is a direct confrontation while D is evasion from the topic which can reduce engagement.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 56.

12. A. Childhood physical, sexual abuse, and neglect are extremely common experiences among those who develop serious mental health problems. But victims are typically reluctant to disclose their histories of abuse and psychiatrists are often reluctant to seek this important information. Though clinicians are not comfortable exploring sexual abuse in the first interview, postponing the discussion once it is disclosed is not an advisable strategy.

Read J, et al. Why, when and how to ask about childhood abuse. *Advances in Psychiatric Treatment* 2007; **13**: 101–110.

13. C. While interviewing people with limited intelligence, questions should be brief and worded in a simple way. Closed and leading questions are best avoided as suggestibility is prominent in this population. Suggestibility in patients with limited intelligence can be assessed using the Gudjonsson Suggestibility Scale. Closed questions are a good way of eliciting information from a disturbed psychotic patient who is guarded or distracted by hallucinations. Confrontation through closed questions may be useful in malingeringers.

Gudjonsson GH and Henry L. Child and adult witnesses with intellectual disability: The importance of suggestibility. *Legal and Criminological Psychology* 2003; **8**: 241–252.

14. E. There is no single question that can reliably elicit premorbid personality traits. A detailed discourse that includes enquiry about hobbies, leisure, predominant mood state, character, and descriptions – both self and by friends – is necessary to understand one's premorbid personality.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 228.

15. D. The CAGE questionnaire includes questions on 'Cut down', 'Annoyed', 'Guilty', and 'Eye opener'. Early morning drinking (not evening as indicated in the question) indicates a problem use of alcohol.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 509.

16. E. While self neglect can be seen in any severe mental illness, it is not very common in isolated anxiety disorders. In alcoholism self neglect indicates a higher risk of vitamin and nutritional deficiencies. In schizophrenia, this may be secondary to negative symptoms or depression.

Garden G. Physical examination in psychiatric practice. *Advances in Psychiatric Treatment* 2005; **11**: 142–149.

17.A. Exuberant dressing and makeup suggests elevated mood. It is possible that the lady described in this scenario has bipolar illness.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 38.

18.B. Serial sevens test is a part of Mini Mental State Examination. In this test, the subject is asked to subtract seven from 100 serially for five times. One point is given for each correct subtraction. Though it has arithmetic properties, in MMSE this test is primarily administered to test attention. Alternatively, the subject may be asked to spell the word 'WORLD' backwards to test attention. The better of two scores is used to calculate final MMSE scores.

Ridha B and Rossor M. *The Mini Mental State Examination. Practical Neurology* 2005; **5**: 298–303.

19.D. Hallucinatory behaviours, such as the one described in this example, are often noted in acutely psychotic patients with poor insight. Questioning the behaviour gently could elicit more information from the patient.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 38.

20.B. Reactivity of affect refers to change in affect in response to environmental cues. Lack of reactivity is common in depression. Congruity is the appropriateness of the person's affect to the symptoms or the thought content. In this case, the affect is appropriate to the symptom of depression.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 81.

21.A. Stability of affect refers to maintaining a particular affective state for a reasonable period of time. Unstable or labile affect – when extreme – presents as emotional incontinence seen in stroke. Severe lability of affect seen in stroke, especially in pseudobulbar palsy, is also called the PLAC (pathological laughter and crying) syndrome. Labile affect is also a feature of mania and delirium.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 233.

22.E. Various schools of thought exist in distinguishing mood from affect. It is generally accepted that mood refers to a more pervasive emotional state than affect. (Climate = mood vs. weather = affect!) Both mood and affect can have objective and subjective components though one school maintains that mood is subjective while affect is objective.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, pp. 82, 96.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 241.

23.A. Nihilism is similar to pessimism with self reference of an extreme belief, for example 'My brain is rotten'. Congruence refers to 'in keeping with' a particular state of mind – nihilism is usually congruent with depression. Nihilism with delusional intensity is seen in psychotic depression.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 96.

24.E. Direct questioning about suicidality does not increase risk of suicide, so evasive questioning is not recommended. A step-wise approach, starting from enquiry about mood state, hopelessness and thoughts of death, passive wishes to die, and active suicidal plans, is often useful in assessment of suicidal thoughts.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 45

25. B. Features suggestive of hypothyroidism include, slowing of EEG, excessive daytime sleepiness, hypothermia, cerebellar ataxia, dementia, psychosis. The peripheral neuropathy in hypothyroidism is a sensorimotor polyneuropathy with loss of reflexes, diminution in vibratory, joint position, and touch-pressure sensations, and weakness in the distal parts of the limbs. Myopathy may also be present. Nerve conduction studies typically show a slowing of nerve conduction velocities. Hypothyroidism is observed to be common in patients with Down's syndrome.

Ropper AH and Brown RH, eds. *Adams and Victor's Principles of Neurology*, 8th edn. McGraw-Hill Companies, 2005, p. 1151.

26. C. Russell's sign was first described in bulimia nervosa. This refers to the skin abrasions, on the dorsum of the hand overlying the fingers, found in patients with symptoms of bulimia. These are caused by repeated contact between the incisors and the skin of the hand which occurs during self-induced vomiting.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 99.

27. B. These features are suggestive of opiate withdrawal. Classical withdrawal from opiates appears in 4 to 12 hours, peaks in 48 to 72 hours, and subsides in a week. It is characterized by symptoms of muscle aches and cramps, severe anxiety and agitation, insomnia, diarrhoea, shivering, yawning, and fatigue. Signs include tachycardia and hypertension, lacrimation, rhinorrhoea, dilated pupils, and 'goose-fleshing' (piloerection) of the skin (hence 'cold turkey' or 'clucking'). Insomnia (with increase in REM sleep) and craving for the drug may persist for weeks. Opiate withdrawal is not usually life threatening.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 524.

28. C. The features of acute confusion, nystagmus, ocular palsy, and ataxia are suggestive of Wernicke's encephalopathy, possibly secondary to alcohol use in a 50-year-old male. In females, an additional likely cause of Wernicke's encephalopathy is hyperemesis secondary to pregnancy or anorexia. Wernicke's encephalopathy is an indirect result of thiamine deficiency. It may be precipitated on administration of glucose to a confused patient in the casualty department. Glucose causes a sudden depletion of the available thiamine stores (via thiamine-dependent transketolase). In people recovering from Wernicke's encephalopathy, 80% develop a Korsakoff's syndrome which is characterized by deficits in anterograde and retrograde memory, apathy, an intact sensorium, and relative preservation of other intellectual abilities.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 460.

29. C. The clinical situation given here is an example of an acute dystonic reaction in a young male, possibly a psychotic patient, who has been started on an antipsychotic. Given the options, risperidone is the most likely causative agent. Procyclidine may relieve the dystonic attack. Alternatively, a benzodiazepine or an antihistamine with anticholinergic action may be used. Risk factors of dystonia include male gender, age younger than 30 years, and using high dosages of high-potency, typical antipsychotics.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 866.

30. A. Absence of nystagmus during an attack of dizziness almost always rules out vertigo secondary to labyrinthine or brain stem pathology. The dizziness here is most likely to be psychogenic in origin – related to panic attacks. This may be accompanied by agoraphobia, which is described as a fear of being in places from where escape may seem impossible or difficult.

Kasper DL, et al., eds. *Harrison's Principles of Internal Medicine*, 16th edn. McGraw-Hill Companies, 2005, p. 132.

31. E. The onset of Huntington's disease is invariably insidious and gradually progressing. Acute onset of chorea is suggestive of a metabolic cause or secondary to toxins. Huntington's disease is an autosomal dominant disease with full penetrance, that is every person with the mutant gene will develop the full form of the disease if they live long enough. Huntington's disease also exhibits genetic anticipation, that is each successive generation suffers progressively earlier onset. Huntington's is a disease of trinucleotide repeat sequences in genetic coding. The pathogenesis is an excess CAG repeats in the *IT15* gene on chromosome 4p. The age of onset depends on the actual number of trinucleotide repeats. Symptoms of Huntington's disease consist of a triad – motor, cognitive, and psychiatric problems. The prevalence of Huntington's is around 4–7 per 100,000 with average life expectancy less than 15 years after symptomatic clinical presentation.

Kasper DL, et al., eds. *Harrison's Principles of Internal Medicine*, 16th edn. McGraw-Hill Companies, 2005, p. 139.

32. A. Features suggestive of subacute combined degeneration of the cord (SACD) include paraesthesia, difficulties with gait and balance, and signs of posterior column dysfunction. This results in sensory ataxia with a positive Romberg's sign and bladder atony. Pain and temperature sensations are usually intact. Bilateral corticospinal tract dysfunction in SACD results in spasticity, hyper-reflexia, and bilateral Babinski's signs. However, reflexes may be lost or hypoactive because of superimposed peripheral neuropathy.

Brazis P, et al. *Localisation in Clinical Neurology*, 5th edn. Lippincott Williams & Wilkins, 2007, p. 106.

33. E. Factitious disorder is a condition where clinical symptoms are consciously and intentionally produced by the patient. But interestingly the only gain for the patient from such symptom production is the adoption of a patient's role, without any clear monetary or employment gains. In malingering, symptoms are consciously and intentionally produced, but the goal is a material or concrete gain, for example claiming employment compensation or avoiding military duty. In somatoform disorders, such as somatization, the symptoms are not produced intentionally and the origin remains unconscious.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 660.

34. B. Neuroleptic malignant syndrome is a medical emergency that can occur when treating a patient with antipsychotics. Symptoms and signs include muscular rigidity, altered consciousness, akinesia, mutism, and agitation. Autonomic symptoms include hyperthermia (temperature $>38^{\circ}\text{C}$), sweating, labile pulse rate, and fluctuating blood pressure. Altered consciousness is not seen in tardive dyskinesia or akathisia.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 868.

35. C. General health questionnaire (GHQ) is used to define psychiatric 'caseness' in epidemiological studies. In community surveys where a large population is screened, the best technique to detect psychiatric illness consists of two phases. Initially, potential cases are identified using a self-rated questionnaire, such as GHQ. Once 'caseness' is suspected, detailed interviews or other diagnostic tools are used to confirm a diagnosis. MMPI stands for Minnesota Multiphasic Personality Inventory. It is a detailed questionnaire used to measure various personality traits (not disorders). HDRS stands for Hamilton Depression Rating Scale. It is a commonly used, clinician administered mood rating scale after a diagnosis of depression is made. Young's Mania Rating Scale (YMRS) is used to measure severity of mania or hypomania.

Goldberg DP, et al. *Manual of the General Health Questionnaire*. NFER Publishing, Windsor, England, 1978.

36.E. Argyll Robertson pupil (ARP) is characteristically associated with neurosyphilis. It refers to bilaterally irregular and miotic pupils with variable iris atrophy. It is also characterized by light near dissociation in which light reflex is absent but accommodation reflex is intact. The site of the lesion causing ARP is the rostral midbrain. There are a number of conditions, including long-standing diabetes, that can cause light near dissociation. Normally, pupils dilate in darkness. In Flynn phenomenon, paradoxically, pupils constrict in darkness. This is seen in congenital achromatopsia, dominant optic atrophy, and in some cases with congenital nystagmus.

Brazis P, et al. *Localisation in Clinical Neurology*, 5th edn. Lippincott Williams & Wilkins, 2007, p. 203.

37.A. Thunderclap headaches are sudden onset, severe headaches radiating behind the occiput with some degree of associated neck stiffness. Very rarely a thunderclap variant of migraine may be seen. This needs to be differentiated from an intracranial bleed. Tension headache is suggested by generalized or bilateral, continuous, tight band-like pain which worsens as the day progresses. It is associated with stress and is often aggravated by eye movement. It is usually relieved by simple analgesics or antidepressants. Migraine is suggested by a typically unilateral, throbbing headache associated with vomiting, prodromal aura, and visual disturbances. Migraine is often precipitated by a set of well-known precipitating factors such as chocolates, menstruation, etc, which most patients will learn during the course of their illness. A cluster headache is suggested by episodic, typically nocturnal pain in one eye associated with congestion and lacrimation for weeks. This cyclically recurs every year at around the same time. Temporal arteritis is suggested by scalp tenderness, jaw claudication, loss of temporal arterial pulsation, sudden loss of vision, and a raised ESR. It is confirmed by temporal artery biopsy.

Douglas G, et al., eds. *Macleod's Clinical Examination*, 11th edn. Churchill Livingstone, 2005, p. 229.

38.A. Waddling gait is seen with severe proximal muscle weakness. Weakness of gluteus medius results in an excessive drop of the hip bone towards the side opposite to the foot placement. Corticospinal tract lesions give rise to a spastic gait. This can be hemiparetic when the lesion is unilateral and paraparetic when the lesion is bilateral. Cerebellar lesions cause a complex gait disturbance according to the area affected. Unsteadiness on standing with eyes open is suggestive of cerebellar lesion. Cerebellar dysfunction leads to a broad-based, unsteady (drunken or ataxic) gait. Postural instability that becomes prominent on closure of eyes is indicative of proprioceptive sensory loss, referred to as sensory ataxia. In order to maintain a stable posture, at least two out of three sources of sensory information regarding one's posture should be normal, that is visual input, vestibular input, and joint position sense. When joint position sense is lost due to posterior column lesion, closing one's eyes will prevent the visual input from compensating for the deficit, leading to loss of balance. 'Astasia abasia' is a conversion disorder where the gait does not confirm to any known neurological deficits. Sometimes such a patient can walk normally but cannot stand and balance herself without support.

Brazis P, et al. *Localisation in Clinical Neurology*, 5th edn. Lippincott Williams & Wilkins, 2007, p. 238.

39.B. Bilateral upper motor neurone lesions of the corticobulbar tract result in pseudobulbar or spastic dysarthria. This is characterized by a small, spastic tongue and difficulty pronouncing consonants. It is associated with pathological laughing and crying. Bulbar palsy is the result of lower motor neurone lesions affecting the nuclei of cranial nerves. The extent of speech disturbance in bulbar palsy depends on the specific cranial nerves involved. Extrapyramidal dysarthria is characterized by a loss in prosody as seen in Parkinson's disease, while cerebellar dysarthria refers to slurred drunken-like speech in patients with cerebellar ataxia. Myasthenia gravis is associated with speech that deteriorates in tone and strength during a discourse secondary to muscular fatigue.

Douglas G, et al., eds. *Macleod's Clinical Examination*, 11th edn. Churchill Livingstone, 2005, p. 239.

40.B. Apraxia is defined as the inability to carry out a motor act despite the absence of sensory or motor deficits. Here the muscular power and tone will be intact and the patient can fully comprehend the instruction. There are many classifications of apraxia according to region affected, for example oculomotor, orofacial, limb-kinetic apraxia. Apraxia is also classified according to specific functional defect, for example dressing apraxia, constructional apraxia, etc. With the exception of dressing and constructional apraxia, apraxic abnormalities are usually secondary to left hemisphere damage. In particular, this includes injuries involving the left frontal and inferior parietal lobes. Ideomotor apraxia (IMA) is the most common type of apraxia. Patients with ideomotor apraxia usually struggle with imitation and copying of skilled movements and falter when using tools. When pantomiming the use of a screwdriver, patients with ideomotor apraxia may rotate their arm at the shoulder and fix their elbow.

Bradley GW, et al., eds. *Neurology in Clinical Practice*, 4th edn. Butterworth-Heinemann, 2003, pp. 117–131.

41.A. Ideational apraxia is an inability to correctly sequence a series of goal-directed acts in spite of the ability to execute the instructions when broken down into single acts. Asking the patient to demonstrate how to prepare a sandwich for lunch is a good test of ideational apraxia because it tests for a sequence of acts. Ideational apraxia is most often associated with dementia. Patients with conceptual apraxia suffer from difficulty in understanding the concept of using tools. Hence they will fail in tests for ideomotor apraxia. Unlike patients with conceptual apraxia, those with ideomotor apraxia have preserved concepts of using tools, but they cannot perform the action when required. Patients with limb-kinetic apraxia demonstrate a loss of dexterity and ability to make finely graded, precise, independent finger movements. They will not be able to employ pincer grasp to pick up a penny. They will also have trouble rotating a coin between the thumb, middle finger, and little finger. Limb-kinetic apraxia most often occurs in the limb contralateral to a hemispheric lesion.

Bradley GW, et al., eds. *Neurology in Clinical Practice*, 4th edn. Butterworth-Heinemann, 2003, pp. 117–131.

42.A. Pure word deafness is a syndrome of isolated loss of auditory comprehension and repetition, without any abnormality of speech, naming, reading, or writing. Pure word deafness is caused by bilateral or sometimes unilateral lesion, isolating Wernicke's area from the input of both Heschl's gyri. Wernicke's aphasia presents with logorrhoea, neologisms, and paragrammatism. Most patients have no elementary motor or sensory deficits. It may be associated with right homonymous hemianopia or upper quadrantanopia. The language disturbances seen in Wernicke's aphasia may be difficult to distinguish from those of schizophrenia. People with Broca's aphasia show agrammatism. Reading is often impaired in Broca's aphasia despite preserved auditory comprehension. It is associated with right hemiparesis, hemisensory loss, and apraxia of the non-paralysed left limbs. Patients with motor aphasia have higher risk of depression. In transcortical aphasia the features of Broca's and Wernicke's aphasias are combined but with intact repetition. Lesions producing transcortical aphasia disrupt connections from other cortical centres into the language circuit. Anomic aphasia refers to an aphasic syndrome wherein naming is the principal deficit. Anomic aphasia is related to dominant angular gyrus lesion and may be accompanied by dominant parietal lesions.

Bradley GW, et al., eds. *Neurology in Clinical Practice*, 4th edn. Butterworth-Heinemann, 2003, pp. 141–161.

43.A. Alexia is the acquired inability to read. Alexia with agraphia is seen in angular gyrus lesions and is associated with Gerstmann syndrome. Alexia with agraphia is seen in insufficiency of vascular supply to territories of angular branch of middle cerebral artery. Patients with alexia without agraphia can write reasonably but cannot read written language. Left posterior cerebral artery insufficiency is associated with alexia without agraphia. This leads to infarction of the medial occipital lobe, the splenium of the corpus callosum, and often extending to the medial temporal lobe. Comprehension is preserved in conduction aphasia. In global aphasia, speech production will be impaired. Conduction aphasia is a result of a lesion in the arcuate fasciculus. Writing and spontaneous reading (not repetition) is preserved in isolated conduction aphasia.

Bradley GW, et al., eds. *Neurology in Clinical Practice*, 4th edn. Butterworth-Heinemann, 2003, pp. 141–161.

44.E. Muscle atrophy, fasciculations, absent reflexes, and hypotonia are features suggestive of lower motor neurone lesion. Features suggestive of upper motor neurone lesion include absence of fasciculations, hypertonia, minimal wasting of muscles, and exaggerated deep tendon reflexes. Corticobulbar and corticospinal tracts are the major upper motor neurone tracts while all peripheral and cranial nerves with motor components perform lower motor neurone function.

Douglas G, et al., eds. *Macleod's Clinical Examination*, 11th edn. Churchill Livingstone, 2005, p. 269.

45.A. Cerebellar limb ataxia is characterized by dysmetria (past pointing), intention tremor, dysdiadochokinesia, and excessive rebound of outstretched arms against a resistance that is suddenly removed. It is also associated with hypotonia and pendular deep tendon reflexes. Asymmetric cerebellar pathology can cause lateralized imbalance with nystagmus, which is present even when eyes are open. This is not Romberg's sign. Romberg's sign refers to prominent postural instability in patients with dorsal spinal column damage when attempting to stand with eyes shut.

Kasper DL, et al., eds. *Harrison's Principles of Internal Medicine*, 16th edn. McGraw-Hill Companies, 2005, p. 140.

46.B. Brown–Séquard syndrome is the result of hemisection of the spinal cord. This consists of: (1) loss of contralateral pain and temperature due to interruption of the crossed spinothalamic tract and (2) loss of ipsilateral proprioception below the level of the lesion due to involvement of the ascending fibres in the posterior columns. It is also associated with ipsilateral spastic weakness due to involvement of the descending corticospinal tract. The 'sensory level' is usually one or two segments below the level of the lesion.

Brazis P, et al. *Localisation in Clinical Neurology*, 5th edn. Lippincott Williams & Wilkins, 2007, p. 105.

47.B. Lid retraction is the most common clinical feature of Grave's ophthalmopathy. The associated extraocular myopathy is attributed to inflammation and fibrosis of muscles. Inferior rectus is most commonly involved and lateral rectus is the least involved of all extraocular muscles. Diplopia may be especially worse early in the day. Other signs include orbital congestion, lid lag on looking down, proptosis, conjunctival injection, and optic neuropathy due to compression of the optic nerve by enlarged extraocular muscles in the orbital apex.

Brazis P, et al. *Localisation in Clinical Neurology*, 5th edn. Lippincott Williams & Wilkins, 2007, p. 175.

48. C. Cluster headache is considered as a vascular headache syndrome. It is usually episodic in nature and is characterized by attacks of acute, periorbital pain. This pain is often deep and excruciating but rarely pulsatile. It occurs almost every day over a 4–8 week period, followed by a pain-free interval that averages a year. Attacks last from 30 minutes to 2 hours. It is often associated with lacrimation, reddening of the eye, nasal stuffiness, lid ptosis, and nausea. It is common in men aged 20 to 50 years. Propranolol and amitriptyline are ineffective. Lithium is beneficial for cluster headache though ineffective for migraine.

Kasper DL, et al., eds. *Harrison's Principles of Internal Medicine*, 16th edn. McGraw-Hill, 2005, p. 93.

49. B. Tuberous sclerosis is a congenital disease where hyperplasia of ectodermal and mesodermal cells leads to various lesions in the skin, nervous system, heart, kidney and other organs. It is characterized clinically by the triad of adenoma sebaceum, epilepsy, and mental retardation. Hypomelanotic skin macules (ash-leaf lesions) and subepidermal fibroses (shagreen patches) are other associated skin lesions noted in tuberous sclerosis. Neurofibromatosis is a hereditary neoplastic syndrome where benign tumours of the skin, nervous system, bones, and endocrine organs are seen. Café au lait spots are characteristic, coffee-coloured skin patches seen in neurofibromatosis. In Sturge–Weber syndrome (encephalotrigeminal angiomas), facial port wine stain associated with cerebral angiomas is seen. Fabry's disease is a glycogen storage disease.

Ropper AH and Brown RH, eds. *Adams and Victor's Principles of Neurology*, 8th edn. McGraw-Hill Companies, 2005, p. 865.

50. D. Progressive supranuclear palsy is a degenerative neurological disease with parkinsonian symptoms as a prominent clinical feature. It is characterized by axial akinetic rigidity, dizziness, unsteadiness, falls, and pseudobulbar dysarthria. Eye movement abnormalities affecting down gaze occur first, followed by variable limitations of upward and horizontal eye movement. Doll's eye movements are preserved as the brain stem is intact. Upper motor neurone signs and occasionally cerebellar signs may be present. Dementia is a common sequel.

Kasper DL, et al., eds. *Harrison's Principles of Internal Medicine*, 16th edn. McGraw-Hill, 2005, p. 2414.

51. B. Trigeminal neuralgia is characterized by episodic shooting pain in facial areas supplied by trigeminal nerve. It often follows specific sensory triggers in the trigeminal zone, for example shaving one's beard, brushing teeth, etc. It is often idiopathic though at times cases of arteriovenous malformations in brainstem around the site where the trigeminal nerve exits the brain stem have been found. An essential feature of trigeminal neuralgia is that objective signs of sensory loss cannot be demonstrated on examination. All the other choices present with trigeminal neuropathy, which is characterized by an objective sign of sensory loss in the distribution of the division of the trigeminal nerve involved.

Kasper DL, et al., eds. *Harrison's Principles of Internal Medicine*, 16th edn. McGraw-Hill, 2005, p. 2434.

52. E. Causes of bilateral facial palsy include granulomatous and connective tissue diseases such as systemic lupus erythematosus, Sjögren's syndrome, sarcoidosis; infections such as meningitis, encephalitis, mastoiditis, leprosy; neoplasms, including pontine glioma and meningioma; trauma resulting in fracture of the temporal bone and birth injury. Miscellaneous known causes include prenatal exposure to thalidomide and chronic diabetes.

Brazis P, et al. *Localisation in Clinical Neurology*, 5th edn. Lippincott Williams & Wilkins, 2007, p. 296.

53. C. Lithium toxicity results in two major groups of symptoms – neurological and gastrointestinal. Delayed ankle jerk is secondary to hypothyroidism. Hypothyroidism in lithium users correlates with pre-existent tendency to develop antithyroid antibodies. This is not dependent on the dose of lithium administered. Coarse (4 to 7 Hz) rather than fine (8 to 12 Hz) tremors indicate lithium toxicity. The fine postural tremor associated with lithium therapy decreases with longer duration of treatment. Alopecia is independent of serum lithium levels. Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 1060.

54. A. Lanugo hair is thin, infantile hair noted on the torso and limbs of severely anorexic patient. Alopecia areata is an autoimmune skin lesion.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 731.

55. C. During sleep, the body goes through two types of physiological states. This has been divided into REM and NREM phase according to EEG studies. NREM is further divided into four stages. At stage 1 smaller slower waves of theta frequency are noted. Stage 2 consists of K complexes and sleep spindles. Stages 3 and 4 are called slow wave sleep as they show dominant delta activity. Stage 3 consists of less than 50% delta activity while stage 4 consists of more than 50% delta waves. REM sleep is comprised of saw-tooth activity. In adults, 75% of sleep is NREM. Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 751.

56. E. An electroencephalograph represents cerebral cortical activity. EEG depends on afferent neural inputs from subcortical structures, including the thalamus and brainstem reticular formation. The thalamic afferents to the cortex are responsible for the alpha rhythm and sleep spindles usually seen in the second stage of NREM sleep. EEG is rarely specific to an illness because different conditions often produce non-specific and similar changes. Hypsarrythmia is associated with infantile spasms (West's syndrome). Three-Hz spike-and-wave activity is associated with typical absence attacks. Generalized multiple spikes and waves (poly-spike wave) are associated with myoclonic epilepsy. Certain parts of the cerebral cortex, such as inferior temporal lobe, are inaccessible to routine electrode placement.

Bradley GW, et al., eds. *Neurology in Clinical Practice*, 4th edn. Butterworth-Heinemann, 2003, pp. 465–491.

57. D. This scenario depicts acute intermittent porphyria (AIP). It is one of the groups of disorders of haem metabolism, characterized by neurological and psychiatric manifestations without obvious cutaneous markers. AIP manifests itself by abdomen pain, neuropathies, and constipation, but, unlike most types of porphyria, patients with AIP do not have a rash. It is an autosomal dominant disorder with presentation starting between ages 18 and 40. It is episodic in nature and the episodes are often triggered by certain medications including oestrogens, barbiturates, and benzodiazepines. Diclofenac can precipitate an episode. Psychiatric manifestations include depression, anxiety, delirium, and psychosis. The most important lab. test is demonstrating increased urinary porphobilinogen during acute attacks. Treatment is aimed at reducing haem synthesis by administering haemin.

Anderson KE, et al. Recommendations for the diagnosis and treatment of the acute porphyrias. *Annals of Internal Medicine* 2005; **142**: 439–450.

58.E. All of these features except a history of seizure disorder may help to differentiate seizures from pseudoseizures. Pseudoseizures are more common in patients with epilepsy than those without. So having an established diagnosis of epilepsy does not rule out pseudoseizures. Patients with pseudoseizures do not have the characteristic prolactin elevation noted after an episode of true seizure; they may have unusually prolonged seizures with asymmetric limb involvement but without bladder or bowel control being lost.

Kasper DL, et al., eds. *Harrison's Principles of Internal Medicine*, 16th edn. McGraw-Hill, 2005, p. 2366.

59.A. Incidence of agranulocytosis in patients on clozapine is less than 1 per 100 patients. The peak occurrence of agranulocytosis with clozapine is between 4 and 18 weeks after initiation of treatment. Weekly monitoring of the white cell or absolute neutrophil count is required for 18 to 26 weeks in most countries, with the frequency decreasing to biweekly or monthly thereafter. It is noted that the risk of clozapine-induced agranulocytosis is equivalent to the risk of agranulocytosis due to any other antipsychotic after 1 year of safe treatment. With regular monitoring, agranulocytosis can usually be detected before infection sets in. Discontinuation of clozapine, treatment with granulocyte colony stimulating factors, and vigorous treatment of infection are usually effective in restoring the white cell numbers. In UK, the Clozaril patient monitoring service (CPMS) maintains central laboratory data of all patients on Clozaril (generic form: clozapine) and sends one of three 'traffic light signals' to clinicians. Amber light is a sign of caution and a count should be repeated. With a red light, clozapine should be immediately stopped and re-challenge should not be done under normal circumstances.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, 1319.

60.B. Exogenous administration of the steroid dexamethasone usually inhibits endogenous cortisol secretion. This cortisol suppression by the exogenous dexamethasone is impaired in patients with depression. This is thought to be due to a disturbed feedback mechanism among cortisol, adrenocorticotropic hormone (ACTH), and corticotrophin releasing hormone (CRH). Dexamethasone suppression is non-specific for depression and is also observed in patients with mania, schizophrenia, dementia, and other psychiatric disorders. There is some evidence to show that patients with dexamethasone non-suppression (test positive) respond well to physical interventions such as antidepressant therapy or electroconvulsive therapy compared to test negative population, though this is not widely replicated.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, 531.

61.D. Immediate availability, especially in head injury units, and ability to enable early detection of haemorrhages make CT scan the preferred diagnostic modality in emergency scenarios.

Kasper DL, et al., eds. *Harrison's Principles of Internal Medicine*, 16th edn. McGraw-Hill Companies, 2005, 2350.

62.A. MRI is more sensitive than CT for the detection of lesions of the spinal cord, cranial nerves, and posterior fossa structures. Diffusion MR is the most sensitive technique for detecting acute ischemic stroke and is useful in the detection of encephalitis and abscesses. CT is the investigation of choice for suspected acute stroke, haemorrhage, and intracranial or spinal trauma. CT is also more sensitive than MRI for visualizing lesions of the bone.

Kasper DL, et al., eds. *Harrison's Principles of Internal Medicine*, 16th edn. McGraw-Hill, 2005, p. 2350.

63. B. In this case, a patient's bipolar disorder has been stabilized on a particular medication. It is likely that this medication is lithium because the symptoms described here are consistent with lithium toxicity. This might have been precipitated by dehydration associated with fever. Other causes that may precipitate lithium toxicity are diarrhoeal illnesses, vomiting and fluid loss, and medications such as diuretics, NSAIDS and ACE inhibitors.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p.1058.

64. D. Prolonged QT interval can predispose to serious ventricular arrhythmia called torsades de pointes (polymorphic ventricular arrhythmia). Many antipsychotics share the propensity to prolong QT interval. A troublesome change in heart rate is not observed clinically with most antipsychotics. Non-specific PR changes can occur with antipsychotic treatment.

Leonard BE. *Fundamentals of Psychopharmacology*, 3rd edn. Wiley, 2003, p. 293.

65.A. ECG abnormalities occur in approximately 25% of all patients on antipsychotics. The most commonly reported changes are the prolonged QT interval (suggestive of repolarization disturbances), depressed ST segments, and abnormal T waves. A prolonged QTc is more likely to be seen in patients with chronic schizophrenia treated with antipsychotics in doses greater than 200 mg chlorpromazine equivalents a day. Thioridazine, pimozide, sertindole, and droperidol prolong QT_c interval to a higher extent than other antipsychotics. TCAs share this propensity with antipsychotics. This predisposes to a fatal form of arrhythmia called torsades de pointes (polymorphic ventricular arrhythmia) leading to sudden death.

Leonard BE. *Fundamentals of Psychopharmacology*, 3rd edn. Wiley, 2003, p. 293.

66. C. Xanthomas indicate the presence of hyperlipidaemia. Metabolic syndrome is a common side-effect of atypical antipsychotic treatment. There is growing concern with metabolic disturbances associated with antipsychotic use, including hyperglycaemia, hyperlipidaemia, exacerbation of existing type 1 and 2 DM, new-onset type 2 DM, and diabetic ketoacidosis.

Chang HY et al. Eruptive xanthomas associated with olanzapine use. *Archives of Dermatology* 2003; **139**: 1045–1048.

67. D. Though folate deficiency itself is not a common cause of depression, in folate-deficient patients, supplementation might increase response to antidepressant treatment. It is currently not clear whether this effect is seen only in folate deficient individuals or if folate could be a potential adjuvant to antidepressant therapy in general.

Taylor MJ, Carney S, Geddes J, and Goodwin G. Folate for depressive disorders. *Cochrane Database Systematic Reviews* 2003; **2**: CD003390.

68. D. Waist circumference is a better predictor than baseline weight with respect to metabolic syndrome. HbA1c is not a screening measure. QT interval is unrelated to metabolic effects of antipsychotics. Here, metabolic side-effects refer to endocrine and metabolic changes associated with antipsychotic therapy.

Newcomer JW. Second-generation (atypical) antipsychotics and metabolic effects: a comprehensive literature review. *CNS Drugs* 2005; **19** (Suppl. 1): 1–93.

69. D. DAT (dopamine transporter) scan is a SPECT scan that visualizes dopamine transporter. Dementia with Lewy bodies (DLB) is one of the main differential diagnoses of Alzheimer's disease (AD). In DLB there is 40–70% loss of striatal dopamine and the loss of dopaminergic cell is accompanied by loss of the dopamine transporter. The loss of dopaminergic neurones in DLB can be confirmed *in vivo* with a DAT scan, which uses a radioligand that specifically binds to the dopamine transporter (FP-CIT). There are no changes in DAT-scan results in Alzheimer's disease compared to controls.

Walker Z et al. Dementia with Lewy bodies: a comparison of clinical diagnosis, FP-CIT single photon emission computed tomography imaging and autopsy. *Journal of Neurology, Neurosurgery and Psychiatry* 2007; **78**: 1176–1181.

70. A. Beta >13 Hz, Alpha 8 to 13 Hz, Theta 4 to 7Hz, Delta < 3Hz. In normal, awake adults lying quietly with the eyes closed, an 8- to 13-Hz alpha rhythm is seen over the occipital region, which is attenuated when the eyes are opened. During drowsiness, the alpha rhythm is again attenuated; with light sleep, slower activity in the theta (4 to 7 Hz) and delta (4 Hz) ranges becomes more apparent. A generalized, faster beta activity (13 Hz) is seen more anteriorly during active wakefulness. Beta activity may be prominent in patients receiving barbiturate or benzodiazepine drugs. Adults normally may show a small amount of theta activity over the temporal regions when awake. A disproportionate increase in slow wave activity should raise suspicions about cerebral pathology.

Bradley GW, et al., eds. *Neurology in Clinical Practice*, 4th edn. Butterworth-Heinemann, 2003, pp. 465–491.

71. E. Slow triphasic waves are typically seen in metabolic encephalopathies such as hepatic failure. Hypsarrhythmia is associated with infantile spasms (West's syndrome). Three-Hz spike-and-wave activity associated with typical absence attacks. Generalized multiple spikes and waves (poly-spike wave) are associated with myoclonic epilepsy. In most cases of delirium, generalized slowing is noted. In delirium tremens and delirium due to withdrawal of sedatives, fast-frequency EEG may be obtained.

Bradley GW, et al., eds. *Neurology in Clinical Practice*, 4th edn. Butterworth-Heinemann, 2003, pp. 465–491.

72. B. EEG during ECT treatment shows sharp waves and spikes during the seizure. This must be recorded equally well on both EEG electrode leads to be confident of a generalized seizure activity. Clearly observable cessation point and good postictal suppression (flattening) are other features aiding confirmation of ictal activity on electric stimulation. See-saw pattern in sleep EEG is noted during REM sleep.

Bradley GW, et al., eds. *Neurology in Clinical Practice*, 4th edn. Butterworth-Heinemann, 2003, pp. 465–491.

73. C. A characteristic neurological feature associated with hypothyroidism is delayed relaxation of deep tendon reflexes. This produces a slow and sluggish reflex. Hypertonia occurs in upper motor neurone lesions. Clonus is a sign of extremely brisk deep tendon reflex, often demonstrated at the ankles. It is a pyramidal sign. Loss of deep tendon reflexes should raise suspicion of a lower motor neurone lesion, for example motor neuropathy. Exaggerated jaw jerk is seen in pseudobulbar palsy, which can occur in motor neurone diseases such as amyotrophic lateral sclerosis.

Garden G. Physical examination in psychiatric practice. *Advances in Psychiatric Treatment* 2005; **11**: 142–149.

74.C. Insertion of cardiac pacemaker precludes MRI study as the magnetic field can disturb the pacemaker rhythm. Increased iron content, as in haemochromatosis, has no effect on MRI clinically! Due to the absence of exposure to radiation of X-ray frequency, pregnancy is not a contraindication to undergo MRI scanning. Patients with a significant degree of claustrophobia might experience intense anxiety while undergoing MRI scan within the closed space of a scanner as undergoing MRI scanning is a more time consuming process than a plain X ray. Learning disability or epilepsy *per se* are not contraindications for MRI.

Kasper DL, et al., eds. *Harrison's Principles of Internal Medicine*, 16th edn. McGraw-Hill, 2005, p. 2350.

75.A. Various guidelines exist for diagnosing dementia. Most of them endorse routinely using clinical interview, especially on the lines of the DSM Definition of Dementia, for making a diagnosis of dementia. To specify subtypes of dementia, guidelines from consortium for DLB, consensus criteria for FTD, consensus for CJD, or Hachinski ischaemic index for vascular dementia may be useful. Sophisticated imaging techniques are not necessary for clinical diagnosis of dementia, for example volumetric MRI or CT measurement strategies.

AGS Clinical Practice Committee. American Academy of Neurology's dementia guidelines for early detection, diagnosis, and management of dementia. *Journal of the American Geriatrics Society* 2003; **51**: 869.

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- 1. The majority of postpartum psychotic episodes are characterized by which of the following presentations?**
 - A. Schizophreniform presentation
 - B. Affective–manic presentation
 - C. Delirium–organic presentation
 - D. Dissociative presentation
 - E. Catatonic presentation

- 2. Which of the following figures represent the correct estimate of the incidence of postpartum psychosis?**
 - A. Around 1–2 in 1000
 - B. Around 1 in 100
 - C. Around 1 in 10,000
 - D. Around 5 in 100
 - E. Around 1 in 2000

- 3. Which of the following postpartum disorders is correctly matched with its time of onset?**
 - A. Postpartum blues – within a few months of delivery
 - B. Postpartum depression – first week of delivery
 - C. Postpartum psychosis – within 2 weeks of delivery
 - D. Postpartum pituitary apoplexy –12 months after delivery
 - E. All of the above are correct

- 4. Which of the following principle has guided the organization of disorders in ICD-10 Chapter V?**
 - A. Hierarchy
 - B. Reversibility
 - C. Treatment response
 - D. Mode of onset
 - E. Degree of disability

- 5. In ICD-10 schizoaffective disorder is included in the same chapter as which of the following disorders?**
- A. Schizophrenia
 - B. Affective disorders
 - C. Organic disorders
 - D. Stress disorders
 - E. Personality disorders
- 6. Which of the following principles is not included in psychiatric classificatory systems (ICD and DSM) to define specific psychiatric disorders?**
- A. Number of symptoms
 - B. Impairment criteria
 - C. Duration criteria
 - D. Prognostic criteria
 - E. Exclusion criteria
- 7. Which of the following is a difference between DSM-IV and ICD-10?**
- A. Culture-bound syndromes are separately classified in ICD
 - B. Comorbid diagnoses are allowed in DSM
 - C. DSM-IV has a dimensional approach to personality disorders
 - D. Length of illness is a criteria for diagnosing DSM-IV schizophrenia
 - E. Schizotypal disorder is a personality disorder in ICD-10
- 8. In the multiaxial system of DSM-IV, the fifth axis refers to**
- A. General medical condition
 - B. Personality difficulties
 - C. Global assessment of functioning
 - D. Psychosocial stress factors
 - E. Intelligence level
- 9. Two clinicians using the same checklist to aid clinical description come up with the same diagnosis. Which of the following properties of the checklist is involved in this outcome?**
- A. Validity of the checklist
 - B. Reliability of checklist
 - C. Sensitivity of checklist
 - D. Specificity of checklist
 - E. None of the above
- 10. Which of the following could increase the validity of psychiatric diagnosis in the future?**
- A. Cross-cultural studies
 - B. Laboratory tests
 - C. Operational criteria
 - D. Cross-sectional studies
 - E. Consensus statements

11. Which of the following is a benefit of a categorical classification over dimensional classification?

- A. Easy to communicate
- B. Increased validity
- C. Prognostic information
- D. Informs qualitative research
- E. All of the above

12. Which of the following disorders has the most evidence for existing as a continuum in the population, making a dimensional approach more rational?

- A. Delusional disorders
- B. Personality disorders
- C. Developmental disorders
- D. Affective disorders
- E. Cognitive disorders

13. By definition, the nature of delirium that differentiates it from dementia includes which of the following?

- A. Insidious onset
- B. Acute onset
- C. Deteriorating course
- D. Familial onset
- E. Irreversible progression

14. Which of the following best describes the nature of cognitive impairment required to diagnose dementia?

- A. Focal, progressive deficits
- B. Focal, static deficits
- C. Global, progressive deficits
- D. Global, static deficits
- E. None of the above

15. The most common cause of presenile dementia is

- A. Vascular dementia
- B. Pick's dementia
- C. Alzheimer's dementia
- D. Lewy body dementia
- E. Prion dementia

16. Which one of the following is NOT a risk factor for developing dementia?

- A. Smoking
- B. Boxing
- C. Ageing
- D. Drinking alcohol
- E. Living alone

17. The best option for preventing dementia available currently is

- A. Regular NSAIDs
- B. Vitamin E
- C. Low salt diet
- D. Early retirement
- E. None of the above

18. Which one of the following genetic factor is associated with senile dementia of Alzheimer's type?

- A. Presenilin 1 only
- B. Presenilin 1 and 2
- C. Amyloid precursor protein
- D. APOE4 allele
- E. Defective tau protein

19. With respect to the major classificatory systems ICD and DSM, the term 'operational definition' refers to which of the following?

- A. Definition arrived at by a consensus
- B. Definition with precise inclusion and exclusion criteria
- C. Definition validated by field trials
- D. Definition with strict duration of illness criteria
- E. Definitions with multilingual translation

20. Dementia secondary to which of the following is not reversible?

- A. Nutritional deficiencies
- B. Hypothyroidism
- C. Stroke
- D. Normal pressure hydrocephalus
- E. Depression

21. Which of the following produce a rapidly evolving dementia with neurological features?

- A. Viruses
- B. Prions
- C. Bacteria
- D. Helminths
- E. Drugs

22. Prion dementia is caused by all of the following EXCEPT

- A. Hormone extracts
- B. Corneal transplants
- C. Organ donations
- D. Peritoneal dialysis
- E. Contaminated meat

23. The probability of developing Korsakoff's syndrome is related to which of the following features?

- A. Amount of alcohol consumed
- B. Nutritional deprivation
- C. Age of onset of drinking
- D. Type of alcoholic drink
- E. Level of tolerance

24. Korsakoff's syndrome is characterized by all EXCEPT

- A. Dense anterograde amnesia
- B. Impaired procedural memory
- C. Apathy
- D. Confabulation
- E. Executive deficits

25. Which of the following best describes the triad characteristic of normal pressure hydrocephalus?

- A. Ataxia, dementia, confabulation
- B. Incontinence, dementia, confabulation
- C. Headaches, visual disturbances, dementia
- D. Headaches, ataxia, dementia
- E. Ataxia, dementia, incontinence

26. Which one of the following clinical signs and diseases is correctly paired?

- A. Wilson's disease—chorea
- B. Huntington's disease—dystonia
- C. Parkinson's disease—tremors
- D. Pseudobulabral palsy—past pointing
- E. Motor neuron disease—ataxia

27. A 40-year-old man develops irritability and depressed mood with significant personality change. His father committed suicide at age of 45 and grandmother suffered from memory problems before she died at age 57. Which is the most important diagnosis to consider in this case?

- A. Parkinson's disease
- B. Wilson's disease
- C. Huntington's disease
- D. Sydenham's chorea
- E. Fahr's disease

- 28. A 45-year-old man develops auditory hallucinations that are initially fragmented but later turns into second person derogatory. The most important aspect of personal history in this case is**
- A. Stimulant use
 - B. Alcohol use
 - C. Relationship difficulties
 - D. Psychosexual history
 - E. Employment history
- 29. Mr Smith considers himself as an alcoholic. He uses the same brand of whisky everyday and drinks at the same pub around the same time. Which of the following features is he exhibiting?**
- A. Salience
 - B. Tolerance
 - C. Narrow repertoire
 - D. Loss of control
 - E. Relief drinking
- 30. Which of the following clinical feature of schizophrenia adds support to a neurodevelopmental hypothesis?**
- A. Age of onset
 - B. Stress-induced relapses
 - C. Increased incidence among migrants
 - D. Association with cannabis
 - E. Response to antipsychotics
- 31. A 32-year-old man presents to a dermatologist with circumscribed areas of alopecia. He admits to recurrent pulling of his hair, especially at times of stress. He feels a sense of relief after the act. He has a normal IQ and no other stereotyped behaviour. Which of the following is the most appropriate diagnosis?**
- A. OCD
 - B. Tourette's syndrome
 - C. Trichotillomania
 - D. Autism
 - E. Factitious disorder
- 32. Risk of developing schizophrenia is increased in which of the following populations?**
- A. Learning disabled population
 - B. Female sex
 - C. Single parent families
 - D. Sexually abused children
 - E. Older mothers

- 33. Which of the following is an important difference between male and female schizophrenia?**
- A. Males have later onset and better prognosis
 - B. Males have earlier onset and better prognosis
 - C. Females have later onset and poor prognosis
 - D. Females have later onset and better prognosis
 - E. Females have earlier onset and poor prognosis
- 34. What is the risk of developing schizophrenia in a concordant monozygotic twin?**
- A. Less than 35%
 - B. Around 45%
 - C. Around 70%
 - D. Around 12%
 - E. Around 90%
- 35. Which is a chromosomal deletion syndrome closely related to schizophrenia phenotype?**
- A. Edward's syndrome
 - B. Patau syndrome
 - C. di George syndrome
 - D. Cri du Chat syndrome
 - E. Laurence–Moon–Biedl syndrome
- 36. A 20-year-old man repeatedly cross-dresses in privacy. He experiences sexual arousal during cross-dressing but has a normal sexual relationship with his girlfriend otherwise. Which of the following is the appropriate diagnosis?**
- A. Disorder of gender identity
 - B. Disorder of sexual preference
 - C. Disorder of sexual orientation
 - D. Disorder of chromosomal sex
 - E. Sexual dysfunction of arousal phase
- 37. A 19-year-old boy shows recent onset avolition, flat affect, preoccupation with religion and philosophy. He preferred being solitary most of his childhood. Most probable diagnosis include**
- A. Simple schizophrenia
 - B. Paranoid schizophrenia
 - C. Hebephrenic schizophrenia
 - D. Residual schizophrenia
 - E. Schizoaffective disorder

38. Which of the following with regard to cannabis use in schizophrenia is incorrect?

- A. Cannabis use could be a self medication attempt
- B. Both schizophrenia and cannabis use are high in lower socioeconomic group
- C. Psychosis in cannabis users may be mediated by polymorphisms in COMT
- D. Cannabis is associated with schizophrenia in a dose-dependent fashion
- E. Cannabis intoxication is indistinguishable from schizophrenia

39. A 38-year-old man had his most recent episode of schizophrenic relapse 6 months ago. Though he responded well to antipsychotics he still hears occasional voices. Currently he has lost sleep, appetite, and weight and complains of low energy and pervasive anhedonia with low mood. This description best fits which of the following diagnosis?

- A. Schizoaffective disorder
- B. Psychotic depression
- C. Postschizophrenic depression
- D. Dysthymia
- E. Unremitted schizophrenia

40. A 37-year-old lady has an eccentric hobby of preserving animal carcasses found on roadside. She also has suspiciousness, magical thinking, and obsessive ruminations though she does not resist them. She has never had a diagnosis of schizophrenia. This description best fits which of the following diagnosis?

- A. Schizoid personality
- B. Schizotypal disorder
- C. Paranoid personality
- D. Obsessive compulsive disorder
- E. Simple schizophrenia

41. How long does the natural course of an episode of untreated mania last?

- A. 4 weeks
- B. 4 months
- C. 6 weeks
- D. 9 months
- E. 2 weeks

42. Which of the following is NOT a part of ICD-10 somatic syndrome of depression?

- A. Loss of appetite
- B. Loss of libido
- C. Loss of sleep
- D. Constipation
- E. Loss of energy

43. A 32-year-old lady is incapacitated by recurrent panic attacks. She feels low and cannot leave her home, leading to loss of interest in leisure activities. She feels guilty for not being a good mother for her 12-year-old son as she finds routine housework extremely demanding. This description best fits which of the following diagnosis?

- A. Depressive disorder
- B. Agoraphobia
- C. Panic disorder
- D. Generalized anxiety disorder
- E. Chronic fatigue syndrome

44. Which of the following is incorrect with regard to social phobia?

- A. Younger age of onset than other phobias
- B. Symptoms more pronounced in large groups
- C. Blushing is more common than in other anxiety disorders
- D. Fear of vomiting in public may be seen
- E. Marked avoidance behaviour is noted

45. Which of the following is the endocrine abnormality most commonly seen in depression?

- A. Hypercortisolaemia
- B. Hypocortisolaemia
- C. Hypothyroidism
- D. Hypopituitarism
- E. Hypoprolactinaemia

46. Which of the following is noted through longitudinal observation of recurrent depressive disorder?

- A. Life events precede onset of each relapse
- B. Life events are more common in later episodes
- C. Life events are more common in earlier than later episodes
- D. No relationship is noted between life events and relapses
- E. Life events precede only the first episode

47. Which of the following endocrine abnormalities is suspected to be associated with rapid cycling bipolar disorder?

- A. Hypercortisolaemia
- B. Hypocortisolaemia
- C. Hypothyroidism
- D. Hypopituitarism
- E. Hyperprolactinaemia

48. Which of the following is NOT a predictor of good outcome in schizophrenia?

- A. Florid positive symptoms at onset
- B. Prominent affective symptoms
- C. Acute onset
- D. Older age of onset
- E. Long first episode

49. Which of the following is NOT a characteristic feature of atypical depression?

- A. Leaden paralysis
- B. Reversed vegetative signs
- C. Response to MAO inhibitors
- D. Rejection sensitivity
- E. Obsessional symptoms

50. Which of the following is a good estimate of heritability of bipolar disorder?

- A. 10%
- B. 25%
- C. 80%
- D. 40%
- E. 95%

51. Even a single episode of mania warrants a diagnosis of bipolar disorder in DSM-IV. What is the proportion of patients with pure recurrent mania without depression among these patients?

- A. 20%
- B. 10%
- C. 5%
- D. 30%
- E. 40%

52. A patient with a family history of affective disorders presents with recurrent periods of elated mood and grandiose delusions believing that he is King Solomon. These episodes last for only 4 days. Which of the following is the most appropriate diagnosis?

- A. Bipolar disorder type 1
- B. Bipolar disorder type 2
- C. Mixed affective state
- D. Cyclothymia
- E. None of the above

53. Which of the following is the most important diagnostic information that differentiates bipolar disorder from schizophrenia?

- A. Interepisode recovery
- B. Presence of delusions
- C. Religious content of hallucinations
- D. Family history
- E. History of cannabis use

54. Which of the following statements about the gender distribution of affective disorders is correct?

- A. Bipolar incidence is equal in both sexes
- B. Unipolar depression is more common in men
- C. Age of onset differs with gender
- D. In childhood, girls are more depressed than boys
- E. Rapid cycling is more common in men

55. According to twin studies, the strongest evidence of a genetic cause is for which of the following disorders?

- A. Schizophrenia
- B. Bipolar disorder
- C. Unipolar depression
- D. Conduct disorder
- E. Alcohol – harmful use

56. To diagnose 'double depression' the patient must have a primary diagnosis of which of the following disorders?

- A. Recurrent depressive disorder
- B. Cyclothymia
- C. Dysthymia
- D. Brief recurrent depression
- E. Alcohol dependence

57. Which of the following is a medical condition in which symptoms similar to OCD are found?

- A. Sydenham's chorea
- B. Guillain–Barré syndrome
- C. Motor neurone disease
- D. Hashimoto's thyroiditis
- E. Cystic fibrosis

58. Strong risk factors for depression include all of the following EXCEPT

- A. Neuroticism
- B. Life events
- C. Past history of depression
- D. Low IQ
- E. Family history

59. Which of the following is true regarding the clinical presentation of OCD?

- A. Acute onset
- B. Early presentation to clinic
- C. Long duration of untreated illness
- D. Chronic deteriorating course
- E. All of the above

60. A 17-year-old patient has recurrent intrusive thoughts which he perceives to be senseless and involuntary. He starts believing these thoughts are being inserted by his family members though these are his own thoughts. Which of the following diagnoses must be considered apart from OCD?

- A. Schizophrenia
- B. Anankastic personality
- C. Depression
- D. Schizotypal disorder
- E. Delusional disorder

61. A 12-year-old boy repeatedly wakes up in middle of night screaming, but could recall only fragments of any mental images. He appears to be disoriented for several minutes on waking. Which of the following diagnoses is the most appropriate?

- A. Nightmares
- B. Night terrors
- C. Sleep apnoea
- D. Narcolepsy
- E. REM sleep behavioural disorder

62. A 25-year-old man has had irrational fear for darkness since childhood. He is not distressed about this currently and does not take special measures to avoid being in the dark. Which of the following is true?

- A. He has a specific phobia as he has an irrational fear
- B. He has a specific phobia as he has had it since childhood
- C. He has no specific phobia as he does not have avoidance behaviour
- D. He has no specific phobia as fear of darkness is common
- E. He has a specific phobia with loss of insight

63. Which one of the following specific phobias is strongly genetic?

- A. Animal phobia
- B. Space phobia
- C. Blood injury injection phobia
- D. Acrophobia
- E. Spider phobia

64. Which one of the following features during trauma has the capacity to predict future development of PTSD?

- A. Anterograde amnesia immediately after trauma
- B. Emotional numbing during trauma
- C. Panic attack during trauma
- D. Crying during trauma
- E. Autonomic arousal during trauma

65. Which of the following is NOT a feature of panic disorder?

- A. Situational panic attacks
- B. Situationally predisposed attacks
- C. Out of the blue panic attacks
- D. Nocturnal panic attacks
- E. Unilateral panic attack

66. Which of the following is an early developmental temperament noted to precede the onset of social phobia in some cases?

- A. Behavioural familiarity
- B. Behavioural stimulation
- C. Behavioural inhibition
- D. Temper tantrums
- E. Cognitive inhibition

67. Which of the following describes the two peaks often noted in the age distribution of panic disorder?

- A. Around age 20 and 50
- B. Around age 30 and 50
- C. Around age 20 and 40
- D. Around age 30 and 40
- E. Around age 50 and 70

68. Which one of the following suggests depression rather than a grief reaction?

- A. Early morning awakening
- B. Blaming oneself for the death
- C. Complaining of symptoms suffered by the dead person
- D. Suicidal ideas
- E. Preoccupation with the death

69. According to Brown and Harris, all of the following predispose to depression following a stressful life event EXCEPT

- A. Early parental loss
- B. Unemployment
- C. Parental responsibility
- D. Lack of confidant
- E. Living in rural isolation

- 70. A woman suffers from recurrent, intrusive flashbacks of a fire accident that she had in the past, accompanied by irritability and sleeplessness. In order to diagnose PTSD, when should the fire accident have happened?**
- A. Within the last 6 months
 - B. Within the last 9 months
 - C. Within the last 12 months
 - D. Within the last 18 months
 - E. Within the last 4 weeks
- 71. Which one of the following is NOT a poor prognostic factor in OCD?**
- A. Male gender
 - B. Poor insight
 - C. Early onset
 - D. Family history of OCD
 - E. Presence of depressive symptoms
- 72. Which of the following is the most common method of attempting self harm in UK?**
- A. Paracetamol overdose
 - B. Benzodiazepine overdose
 - C. Hanging
 - D. Car exhaust
 - E. Jumping from heights
- 73. What is the proportion of suicide victims who attended their primary care practitioner within 4 weeks prior to suicide?**
- A. 33%
 - B. 25%
 - C. 66%
 - D. 40%
 - E. 13%
- 74. A patient has tenacious sense of personal rights, leading on to repeated quarrels with neighbours. A personality disorder to be considered is**
- A. Anankastic PD
 - B. Dependent PD
 - C. Passive aggressive PD
 - D. Paranoid PD
 - E. Borderline PD
- 75. Which of the following is feature of schizoid personality disorder?**
- A. Inability to plan ahead
 - B. Sensitivity to rejection
 - C. Indifference to praise or criticism
 - D. Excessive self importance
 - E. Impulsivity and lack of self restraint

76. Excessive concern with physical appearance, shallow, labile affect, and egocentricity are a feature of which of the following?

- A. Histrionic personality
- B. Narcissistic personality
- C. Antisocial personality
- D. Borderline personality
- E. Dysmorphophobia

77. Fear of abandonment is a feature of borderline personality. It is also seen in which other personality disorder?

- A. Avoidant personality
- B. Dependent personality
- C. Histrionic personality
- D. Anankastic personality
- E. None of the above

78. Which personality disorder is considered to be closely associated with bipolar diathesis?

- A. Borderline personality
- B. Narcissistic personality
- C. Antisocial personality
- D. Schizoid personality
- E. Schizotypal personality

79. Which is the most common major mental illness in patients with anankastic personality?

- A. OCD
- B. Schizophrenia
- C. Depression
- D. Generalized anxiety disorder
- E. Eating disorder

80. The percentage of schizophrenic patients who ultimately commit suicide is approximately

- A. 1%
- B. 5%
- C. 10%
- D. 20%
- E. 30%

81. What is the estimated risk of developing schizophrenia throughout the lifetime of an average person in the population?

- A. 1 in 150
- B. 1 in 1000
- C. 1 in 500
- D. 1 in 100
- E. 1 in 30

82. Which of the following is NOT true with respect to narcolepsy?

- A. Sleep onset REM
- B. Abnormalities in routine EEG
- C. HLA-DR2 associated
- D. Sleep paralysis is seen
- E. Autosomal dominant inheritance is noted

83. Somnambulism is a disorder of which stage of sleep?

- A. REM
- B. Slow wave
- C. Stage 2 NREM
- D. Stage 1 NREM
- E. Any of the above

84. Which of the following is a sleep disturbance characteristic of mania?

- A. Reduced early morning sleep
- B. Reduced initial sleep
- C. Reduced need for sleep
- D. Reduced latency of sleep
- E. None of the above

85. Which of the following is NOT a medical cause of panic attacks?

- A. Hypoglycaemia
- B. Arrhythmias
- C. Mitral valve prolapse syndrome
- D. Hypothyroidism
- E. Phaeochromocytoma

86. Which of the following statements with respect to the natural history of eating disorders is true?

- A. Nearly 50% of patients with bulimia have a past history of anorexia nervosa.
- B. Nearly 50% of patients with anorexia nervosa have a past history of bulimia.
- C. Bulimia and anorexia nervosa coexist simultaneously in 50% of patients.
- D. Bulimia and anorexia are mutually exclusive diagnoses.
- E. 80% of anorexia patients achieve complete remission in 6 months.

87. Dementia can be differentiated from pseudodementia by all of the following EXCEPT

- A. Verbal memory
- B. Visuospatial function
- C. Executive functions
- D. Motor disturbances
- E. Frontal release signs

88. Which one of the following statement about paraphrenia is NOT correct?

Paraphrenia is

- A. Common in females
- B. Often associated with sensory impairment
- C. Associated with premorbid paranoid personality
- D. Associated with prominent negative symptoms
- E. Associated with persecutory delusions

89. Multiple personality disorder is a controversial diagnosis described under which of the following group of disorders?

- A. Personality disorders
- B. Organic disorders
- C. Schizophrenia
- D. Dissociative disorders
- E. Not included in either DSM-IV or ICD-10

90. Which of the following symptoms is/are a characteristic feature in dissociative fugue?

- A. Depressive symptoms
- B. Depersonalization symptoms
- C. Defective new learning
- D. Wandering far away with assumption of a new identity
- E. Family history of epilepsy

91. Which of the following is a feature of chronic fatigue syndrome?

- A. Disproportionate fatigue compared to exertion
- B. Fatigue is not relieved by adequate rest
- C. Fatigue is of new onset
- D. Joint aches and tender points are noted
- E. All of the above

92. Which of the following best differentiates hypochondriasis from somatoform disorder?

- A. Patients with hypochondriasis are concerned about symptoms rather than diagnosis
- B. Hypochondriacal patients ask for treatment rather than investigations
- C. Somatizing patients are concerned about diagnosis
- D. Somatizing patients ask for treatment and symptom relief
- E. Hypochondriasis responds better to treatment

- 93. A young lady develops transient bladder incontinence coinciding with a recent job loss. A few months later she presents to her GP with weakness of the right leg. Which of the following medical disorder is often confused with conversion disorder?**
- A. Myasthenia gravis
 - B. Guillain-Barré syndrome
 - C. Brain tumour
 - D. Creutzfeldt-Jakob disease
 - E. Multiple sclerosis
- 94. Which of the following is the single most important factor predicting suicide risk?**
- A. Recent life event
 - B. Family history of suicide
 - C. Past history of suicidal attempt
 - D. Recent discharge from hospital
 - E. None of the above
- 95. You are bleeped to assess five patients at the same time at A & E. Which one of the following has highest risk of suicide compared to the others?**
- A. 32-year-old woman with obsessional symptoms
 - B. 56-year-old widower who tried to gas himself using an exhaust
 - C. 22-year-old girl presenting after a recent break-up, having consumed alcohol before calling her boy friend and taking an overdose
 - D. 83-year-old cognitively impaired lady who took eight instead of four sleeping pills on the same day of prescription
 - E. 41-year-old heroin user demanding methadone from A & E
- 96. Prevalence of major depression among patients with dementia is**
- A. 10%
 - B. 50%
 - C. 15%
 - D. 20%
 - E. 35%
- 97. A 45-year-old man presents to A & E with complaints of hearing voices. On further questioning he claims amnesia for the content of these voices and reveals he has lost his tenancy the previous day due to aggressive behaviour. An important diagnosis to consider is**
- A. Malingering
 - B. Depression
 - C. Temporal lobe epilepsy
 - D. Factitious disorder
 - E. Stress reaction

- 98. A 16-year-old boy presents with cycles of sleepiness lasting for weeks associated with excessive weight gain and hunger. Which of the following is an appropriate diagnosis?**
- A. Stein Leventhal syndrome
 - B. Klein–Levine syndrome
 - C. Klüver–Bucy syndrome
 - D. Dorian Gray syndrome
 - E. Charles Bonnet syndrome
- 99. Which one of the following sleep disturbances is associated with Parkinson's disease?**
- A. Somnambulism
 - B. Sleep talking
 - C. Night terrors
 - D. REM behavioural disorder
 - E. Sleep bruxism
- 100. A 32-year-old man presents with beliefs that he has a chip in his brain that could neutralize all nuclear radiations in his presence. He stops often in mid sentence and continues conversation on a different theme altogether. Which of the following neurological conditions mimics thought blocking?**
- A. Multiple sclerosis
 - B. Infantile seizures
 - C. Absence seizures
 - D. Atonic seizures
 - E. Narcolepsy

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1. B. It is well known that postpartum psychosis is often an episode of bipolar manic illness. A small minority have schizophreniform presentation or organic, delirious presentation. Another episode of relapse occurs in the same year in nearly 70% and risk during subsequent pregnancy is greater than 50%. In delirious presentations, ruling out organic cause, such as postpartum pituitary apoplexy, is very important.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 866.

2.A. Postpartum psychosis affects 1 to 2 per 1000 childbirths. Initially, it was claimed that the incidence was higher in the West but, currently, comparable rates have been obtained worldwide. In contrast, postpartum depression affects 10 to 15% of all mothers, while postpartum blues affects 50 to 70% of mothers.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 866.

Also see

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 747.

3.C. Time of onset of symptoms is an important clue in postpartum illnesses, especially to aid diagnosis during early presentation. Postpartum blues typically start 3 to 5 days after delivery; postpartum psychosis is also of acute onset and can develop between 2 weeks and 2 months after delivery; postpartum depression can occur anytime between 2 months and 1 year after childbirth, most commonly in the third month.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 867.

4.A. Jasperian hierarchy refers to the principle that, in psychiatric practice, some diagnoses when made preclude using another diagnostic label even if a second diagnosis could account for a constellation of symptoms. For example when a diagnosis of major depression is made, symptoms of generalized anxiety are included in the description of depression itself; a separate diagnosis of generalized anxiety disorder need not be entertained. Similarly, depressive symptoms can be present during an acute psychotic episode of schizophrenia – they need not always indicate a separate diagnosis of depression. The hierarchy is maintained in ICD-10, to some extent, in the way the various chapters of ICD are organized. Organic disorders trump a diagnosis of psychotic disorders, which in turn are more or less equally considered with affective disorders. Affective disorders trump neuroses, which in turn trump personality disorders. DSM has abandoned this hierarchy to a large extent, though the principle is retained. Different modes of onset or degrees of disability will not yield differing diagnosis. Treatment response cannot be considered as a principle for organization of ICD-10 Chapter V.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 247.

5.A. Schizoaffective disorder is a diagnosis that lies between schizophrenia and affective disorder. It is placed together with schizophrenia in section F20–29. ICD-10 stipulates that schizophrenic and affective symptoms must be simultaneously present and both must be equally prominent. In DSM-IV the concept of a continuum between psychosis and affective illness is better highlighted. According to DSM-IV: (1) both schizophrenia and affective disorder categories must be met simultaneously; (2) a period of psychosis (2 weeks) without prominent affective symptoms must be present; and (3) the mood disturbance must be present for a substantial period during active (psychotic) and residual periods. Note that in postschizophrenic depression (classified under schizophrenia in ICD-10) the psychotic symptoms must not be prominent (but residual) when a depressive episode is present, and depression must be within 12 months of the most recent psychotic episode. Schizophreniform disorder is a diagnosis used when schizophrenia does not fulfil the duration criteria in DSM-IV (<6 months). This diagnosis is not included in ICD-10.

World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders; Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992, p. 106.

6.D. In general, both DSM and ICD use symptom count, age of onset, duration, impairment, and exclusion criteria for many psychiatric diagnoses. Aetiological information and theoretical speculations are avoided in classification. Course specifiers are used often in DSM-IV to aid in subtyping a disorder. Good or poor prognostic typology is not employed as a classification principle in either of these systems.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, pp. 8, 9.

7.D. In DSM-IV a period of at least 6 months of observation is required before a reliable diagnosis of schizophrenia could be made. In ICD-10 a period of 1 month is used instead. This makes DSM-IV schizophrenia narrower than ICD-10 schizophrenia. Schizotypal disorder is a personality disorder according to DSM-IV not ICD-10. Culture-bound syndromes are separately coded in DSM, which is largely an American system. ICD-10 encompasses cultural differences in various places throughout the text.

World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders; Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992, p. 86.

8.C. DSM is multiaxial – it consists of five axes:

Axis 1. Primary psychiatric diagnosis

Axis 2. Personality difficulties or learning difficulties; can include defence mechanism/ coping strategy employed predominantly

Axis 3. General medical condition (may or may not be related to Axis 1 or 2)

Axis 4. Psychosocial stressor (both positive and negative)

Axis 5. Global assessment of functioning (highest score achieved over a few months in the last year in various domains of life)

Note that ICD-10 also has a multiaxial version, which has three axes.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 306.

9. B. Reliability of a test refers to its ability to produce the same results when tested at different times (test-retest reliability) or tested by different observers at the same time (observer reliability). Validity refers to the ability of a test to measure what it sets out or intends to measure. Sensitivity refers to the ability of a test to pick the highest number of true patients from a sample to whom it is administered. Specificity refers to the ability to identify the correct diagnosis among various different possibilities. Reliability of diagnostic classifications is enhanced by using operationalized check lists. Field trials enhance the validity. Reliability and validity need not always correlate. It is possible for many clinicians to make the same diagnosis which is not really right (reliable but invalid). Validity has a ceiling set by reliability – very low reliability can reduce validity though vice versa is not true.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 253.

10. B. How can we know whether the diagnosis we make using a set of descriptions and observation is the true condition that a patient has? Cross-sectional studies of even a huge number of patients cannot answer this question. Longitudinal study of the patient in question can improve claims about a diagnosis – but classification systems are typically constructed to enable a clinician to make a diagnosis after a time-sliced, cross-sectional interview rather than a lifelong observation. We can ensure that everyone makes the same diagnosis by having a consensus statement or cross-cultural studies. Definite laboratory measures that are objective can, if developed, increase the validity of a diagnosis.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 253.

11.A. Categorical classification refers to the current ICD-10 and DSM-IV approach of using mutually exclusive labels for diagnosis in an 'all or none' fashion. A diagnosis is either present or absent according to this system, very similar to the medical model – pneumonia is either present or absent. Relative advantages of a categorical system are (1) it is very familiar and not complex to construct; (2) it is easy to remember and communicate; and (3) it informs management decisions readily (e.g. if there is malaria, give chloroquine). A dimensional approach considers a continuum of diagnostic issues; it uses degrees of severity of a particular dimension (say mood, anxiety) rather than mutually exclusive 'boxes' of diagnosis. In this way various dimensions can be employed simultaneously to describe a patient's difficulties. Relative advantages of a dimensional system include: (1) more information is conveyed and this may include valuable information of prognostic importance that can be missed using plain categories; (2) it is very flexible; (3) it does not impose strict, artificial boundaries between disorders and so has better validity; and (4) it is more holistic and less labelling, thus informing qualitative research.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 254.

12. B. It has been argued that personality disorders are better considered in a continuum with normalcy and so a dimensional approach is tipped for personality disorders in future DSM classifications. Note that contemporary cognitive psychologists consider delusions to exist in a continuum of normal beliefs and so a modular approach is criticized. But this does not imply that delusional disorders, as defined currently, exist in such a continuum.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 254.

13. B. Delirium is an acute confusional state by definition. It may or may not be reversible depending on the aetiology. Most cases are reversible and have a non-deteriorating episodic course. Both dementia and delirium have an impact on global cognitive abilities, including memory.

World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders; Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992, p. 57.

14. C. Dementia is an organic syndrome wherein progressive, global cognitive disturbance is noted. Dementia is often irreversible. Cognitive disturbances include memory difficulties (amnesia), aphasia, agnosia, apraxia, impaired executive function, and personality changes. Significant psychosocial impairment must be present to warrant a diagnosis of dementia. Clouding of consciousness, impaired attention, wide diurnal fluctuation, presence of autonomic signs, and a high degree of reversibility on treating the potential cause are other differentiating features that point towards delirium.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 132.

15. C. Alzheimer's dementia is the most common dementia in both older and younger patients. Risk of Alzheimer's increases with age. About 1% risk at age 60 years then doubles every 5 years becoming nearly 40% of those aged 85 years. Women are affected three times more often. Down's syndrome, previous head injury, hypothyroidism, family history of dementia, and supposedly low educational attainment are other risk factors. Alzheimer's is implicated in up to two-thirds of all senile dementia.

Sampson EL et al. Young onset dementia. *Postgraduate Medical Journal* 2004; **80**: 125–139.

16. E. Smoking is a risk factor for dementia especially of the vascular type, though controversies exist as to whether smoking could prevent Alzheimer's disease. A large survey of UK male doctors followed up from 1951 has demonstrated that smoking in fact increases the risk of Alzheimer's. Also in a prospective, population-based cohort study of 6868 participants >55 years followed up for an average of 7 years, smoking was associated with increased risk of any dementia in general, and Alzheimer's in particular. Ageing increases the risk of dementia. Boxing is associated with dementia pugilistica wherein neurofibrillary tangles are observed. Alcoholic dementia occurs in excessive drinkers. Living alone does not increase the risk of dementia.

Reitz C et al. Relation between smoking and risk of dementia and Alzheimer disease: the Rotterdam Study. *Neurology* 2007; **69**: 998–1005.

17. E. Evidence for dementia preventive strategies has emerged recently though this is largely concerned with delaying the onset rather than abolishing the risk. Sustained use of NSAIDs is associated with a reduced risk of developing AD. Some NSAIDs appear to modulate the amyloid load in the brain. But NSAIDs have significant adverse effects that might limit their potential as primary preventive agents in AD. Oestrogens and HRT cannot be recommended and the potential of statins remains to be fully assessed. Evidence for using antioxidant supplements such as vitamin E and vitamin C is far from clear cut and there are safety concerns about higher doses of vitamin E. Strategies to target mid-life vascular risk factors are likely to have an important effect on the age of presentation of AD, though as of now none of the given options are recommended to prevent dementia.

Jones RW. Primary prevention of dementia. *Psychiatry* 2007; **6**: 511–513.

18. D. Of patients with Alzheimer's, 40% have a positive family history of Alzheimer's. This is especially true if the patient is younger (<55). Among various genes implicated, Chromosome 21 carries the gene for amyloid precursor protein (APP) which when mutant increases amyloid deposition even before senility, so it is associated with younger-onset dementia. Trisomy 21 acts via the same mechanism in Down's. The *APO* gene on chromosome 19 codes for apolipoprotein (apo). People with one copy of the *APOE4* allele have Alzheimer's three times more frequently than do those with no *APOE4* allele, and people with two *APOE4* alleles have the disease eight times more frequently. Diagnostic testing for *APOE4* is not recommended because it is seen in more patients without Alzheimer's than those with the disease and so accounts only for 50% of genetic variance. E3 is the most common *APOE* allele and E2 may be protective. It is possible that apoE4 mediates Alzheimer's risk via lipid metabolism as the presence of apoE4 increases cholesterol levels in blood. Chromosome 14 (presenilin 1) and chromosome 1 (presenilin 2) are also implicated in early-onset Alzheimer's via increased beta amyloid deposition.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 392.

19. B. The term operational definition refers to a definition that is specified by a series of precise, unambiguous inclusion and exclusion criteria. In other words, an operational definition is arrived at by using a checklist. This improves the reliability of a classificatory system tremendously. Before the popular use of ICD and DSM systems, the cross-national agreement for psychiatric diagnosis was very poor, as exemplified by the US–UK diagnostic study. In the UK, the rate of manic depression was ten times higher and the rate of schizophrenia was two times lower than the prevalence in the US (Cooper, 1972). Operational definitions paved the way for the wider use of standardized diagnostic instruments, increasing the reliability of classification.

Gelder MG et al., ed. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 30

Cooper JE. et al. *Psychiatric Diagnosis in New York and London*. Maudsley Monograph 20. Oxford: Oxford University Press, 1972.

20. C. Reversible causes constitute nearly 15% of initial diagnoses of dementia. The proportion is higher in younger patients. The reversible causes are commonly subdural haematoma, normal pressure hydrocephalus (NPH), vitamin B₁₂ deficiency, metabolic causes, and hypothyroidism. Stroke causes vascular dementia which is irreversible.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 132.

21. B. Creutzfeldt–Jakob disease (CJD) is a prion disease that presents with rapidly evolving dementia with multiple neurological features. Prions are virus-like transmissible agents but without any nucleic acid. They are simple, mutated proteins originating from the normal human prion protein gene (*PRNP*), which is located on the short arm of chromosome 20. When mutant PrP^{Sc} is formed it is partially protease-resistant with a capacity to change further normal PrP to PrP^{Sc}, initiating a cascade. CJD presents non-specifically with fatigue and flu-like symptoms with rapid development of neurological findings such as aphasia, cerebellar signs, myoclonus, apraxia with emotional lability, depression, delusions, hallucinations, or marked personality changes. The disease is rapidly progressive with dementia, akinetic mutism, coma, and death occurring within few months of onset.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 76.

22. D. Sporadic onset accounts for 85% of cases with CJD, while 10% result from genetic mutation. The remaining 5% result from iatrogenic transmission during transplant surgery of dura and corneal grafts, and pituitary growth hormone. vCJD is a variant form of human CJD that is transmitted by eating contaminated meat of an animal with bovine spongiform encephalopathy. Peritoneal dialysis does not involve foreign tissue.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 77.

23. B. Wernicke–Korsakoff syndrome is considered to be a nutritional illness seen in alcoholics. Thiamine deficiency can occur secondary to gastrectomy, carcinoma stomach, anorexia, haemodialysis, hyperemesis gravidarum, prolonged intravenous hyperalimentation, and alcoholism. This produces neuronal damage with small vessel hyperplasia and occasional haemorrhages especially in diencephalic structures such as mamillary bodies and medial dorsal thalamus. There is no clear correlation between amount, type, or duration of alcohol consumption and incidence of Korsakoff's syndrome. It is thought that patients who develop Korsakoff's may have abnormal transketolase enzyme, involved in thiamine metabolism.

Lishman WA. *Organic Psychiatry: The Psychological Consequences of Cerebral Disorder*, 3rd edn. Blackwell Science, 1997, p. 576.

24. B. In Korsakoff's syndrome recent memory tends to be affected more than is remote memory. Confabulation, apathy, and executive dysfunction are prominent. The length of retrograde amnesia is variable. Working memory and attention are preserved. The implicit emotional learning and procedural memory are preserved, facilitating rehabilitation; 75% of these patients show some degrees of improvement, whilst 25% show no change.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 530.

25. E. Normal pressure hydrocephalus or NPH is a syndrome of cerebral ventricular dilatation with normal CSF pressure. The changes are prominent in the third ventricle, affecting the pyramidal tract representing legs. This leads to a triad of: dementia, gait ataxia, and urinary incontinence. The dementia is reversible if NPH is treated promptly with shunt or repeated lumbar puncture.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 150.

26. C. In Wilson's disease athetosis with wing beating movements are noted. Huntington's disease is characterized by chorea while a patient with pseudobulbar palsy shows exaggerated jaw jerk and emotional lability. In motor neurone disease combined upper and lower motor neurone signs are noted. Ataxia typically occurs in posterior column, cerebellar, or vestibular damage. The tremor in Parkinson's is described as pill rolling tremor.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 170.

27. C. The clues in this case are young age of onset, presence of irritability, and personality change with family history including a degree of 'anticipation' over generations. Premature death, suicide, and psychiatric problems point to Huntington's disease in family members. The onset is usually during the fourth decade with significant numbers showing juvenile presentation with successive generations. The course is almost always a deteriorating pattern with death occurring around 10–12 years after diagnosis. Fahr's disease refers to idiopathic bilateral basal ganglia calcification.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 172.

28. B. In alcoholic hallucinosis, psychotic symptoms start either during intoxication or withdrawal, but in a clear sensorium. The most common symptoms are auditory hallucinations; these are usually unstructured voices which can develop into persecutory or derogatory content. The hallucinations usually last for a short period and any persistence beyond 6 months is a strong suspicion for other psychotic illnesses such as schizophrenia.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 400.

29. C. Narrowed repertoire of drinking was included as one of the criteria for alcohol dependence by Griffith Edwards and Milton Gross in 1976. Heavy drinkers may have a wide drinking repertoire. This narrows as dependence advances. The dependent person may start to drink in a restricted pattern and manner every day, which would ensure a constant blood-alcohol level avoiding any symptoms of alcohol withdrawal. This is different from salience wherein priority is given to alcohol over other important areas of life and even painful consequences are disregarded.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 483.

30. A. The peak ages of onset are 10 to 25 years for men and 25 to 35 years for women. Age of onset of schizophrenia is quoted as a supporting feature of neurodevelopmental hypothesis. A substantial reorganization of cortical connections, involving a programmed synaptic pruning, takes place during adolescence in humans. An excessive pruning of the prefrontal synapses, perhaps involving the excitatory glutamatergic inputs to pyramidal neurones, may underlie schizophrenia. This is called the Feinberg hypothesis.

Keshavan MS et al. Is schizophrenia due to excessive synaptic pruning in the prefrontal cortex? The Feinberg hypothesis revisited. *Journal of Psychiatric Research* 1994; **28**: 239–265.

31. C. Stereotyped and recurrent pulling of hair with exacerbations during times of stress is characteristic of an impulse control disorder called trichotillomania. Similar to other impulse control disorders such as kleptomania, there is a sense of relief associated with the act. This commonly involves the scalp, facial hair, or axillary hair. The prognosis in children is better than adults; the latter often show a chronic fluctuating course. Some patients may bite the pulled hair, and complications such as intestinal obstruction can occur, especially in children. Differential diagnoses for compulsive hair pulling include OCD, Tourette's syndrome, and pervasive developmental disorders.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 387.

32. A. There is a strong correlation between low IQ and incidence of schizophrenia. Traditionally, male and female incidences were thought to be equal but this has been recently challenged. McGrath undertook an exhaustive review of the literature on incidence rates and concluded that distribution of rates was significantly higher in males compared to females; the median male/female rate ratio was 1.40 in this analysis. Another meta-analysis, looking at 20 year's data on patients under 64, concluded similarly. Note that prevalence of schizophrenia does not differ between sexes. This may be because mortality is higher in males with schizophrenia.

Aleman A, Kahn RS, and Selten JP. Sex differences in the risk of schizophrenia: evidence from meta-analysis. *Archive of General Psychiatry* 2003; **60**: 565–571.

33. D. Though schizophrenia is equally prevalent in men and women, differences exist in the onset and course of illness. Onset and age at first hospitalization are earlier in men; women display a bimodal age distribution, with a second peak occurring in middle age. It is observed that men are more likely to be impaired by negative symptoms and women are more likely to have better premorbid adjustment. The outcome for female schizophrenia patients is better than that for male schizophrenia patients; currently it is unclear whether this could be attributed to later age of onset in females.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 468.

34. B. The prevalence of schizophrenia in general population is around 1%. The prevalence rate increases when considering non-twin siblings of schizophrenia patients (8%). The risk is further elevated to 12% for a child born to a mother or father with schizophrenia. The risk shoots to 40% if both parents have schizophrenia, while having a monozygotic twin with schizophrenia increases the risk to 47% for the second twin. In dizygotic twins the risk is similar to that for a non-twin sibling, that is 12%.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 471.

35. C. Velo-cardio-facial or di George syndrome (VCFS) is a genetic, autosomal dominant condition defined by Shprintzen in 1978. It occurs in 1 per 4000 live births; spontaneous deletion of chromosome 22q11.2 is responsible in most cases. It is characterised by mental retardation, facial dysmorphic features, cardiac anomalies, and neuroendocrine abnormalities, such as absent parathyroid, maldeveloped thymus, etc. It is thought to be related to problems in neural crest cell migration. Interestingly, the recent discovery of COMT polymorphism to be located at the same chromosomal loci adds to the speculation that psychosis is linked to this chromosome.

Chow EWC, Bassett AS, and Weksberg R. Velo-cardio-facial syndrome and psychotic disorders: implications for psychiatric genetics. *American Journal of Medical Genetics* 1994; **54**: 107–112.

36. B. The patient described in this question achieves sexual arousal by cross-dressing and retains heterosexual relationships. He is exhibiting fetishistic transvestism, a paraphilia or disorder of sexual preference. A patient with gender identity disorder will have dysphoria for biologically assigned gender (most often male sex) and will strongly prefer to change his appearance to that of opposite sex, through hormonal treatment or corrective surgeries. Sexual dysfunction of arousal phase refers to sexual aversion or lack of interest in having sexual intercourse. The scenario does not reflect the person's sexual orientation. Sexual orientation refers to homosexuality, heterosexuality, or bisexuality preference of an individual.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 475.

37. C. The disorganized or hebephrenic schizophrenia is characterized by significant disruption in behaviour with some disinhibition. It characteristically has an earlier onset – around adolescence. These patients have pronounced formal thought disturbances, often with inappropriate emotional responses and incongruity of expression. In negative schizophrenia a deficit state starts without any positive psychotic symptoms. Residual schizophrenia is characterized by a history of florid positive symptoms in the past with current presentation suggestive of a negative syndrome. Schizoaffective disorder will have florid affective symptoms at the same time as prominent psychotic features.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 477.

38. E. Cannabis intoxication can alter perceptual accuracy; colours may seem brighter with subjective slowing of the time. Depersonalization and derealization could occur. Cannabis-induced psychotic disorder is rare; transient paranoid ideation is more common. Hemp insanity refers to transient psychosis associated with heavy use of very potent cannabis. This is very rare and does not mimic schizophrenia in its course. It is generally believed that earlier onset of heavy potent cannabis use for a long duration can result in schizophrenia, at least in a group of genetically predisposed individuals. Cannabis can induce a sense of euphoria and relaxation, prompting self medication in patients with established schizophrenia.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 603.

39. C. Post schizophrenic depression is recognized in ICD-10 as a major depressive episode which starts within 12 months of the most recent psychotic episode; while residual psychotic symptoms can be present they must not be prominent. It is noted that such patients are likely to have had poor premorbid adjustment, schizoid traits, and more insidious onset of their psychotic symptoms. Family history of a mood disorder can increase the likelihood of developing post schizophrenic depression. It may be associated with a less-favourable prognosis, higher relapse, and a higher rate of suicide. DSM-IVTR considers postschizophrenic depression only as a research category.

World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders; Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992, p. 93

40. B. Persons with schizotypal (personality) disorder are strikingly peculiar, with magical thinking, occult beliefs, referential ideas, illusions, and obsessions without resistance. A significant number of patients claim paranormal experiences and clairvoyance. It occurs in about 3% of the population. A strikingly higher incidence is noted in those who are biological relatives of patients with schizophrenia. This disorder is so close to schizophrenia that ICD still includes schizotypal disorder together with other schizophrenia syndromes in Chapter F20–29.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 640.

41. B. In its natural course untreated depression lasts for 6 months while untreated mania lasts for about 4 months. So it is important that the therapy continues throughout this period as an absolute minimum. A manic episode by definition must meet a duration criteria of at least 1 week, or less if a patient must be hospitalized. A hypomanic episode must last at least 4 days. It is thought that as time goes, the intervals between episodes shorten, and the episodes themselves increase in duration. In a lifetime, patients with bipolar illness can have more than 10 episodes (both mania and depression) with duration and interepisodic interval stabilizing after the fourth or fifth episode.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 550.

42. D. ICD-10 somatic syndrome includes: (1) loss of emotional reactivity; (2) diurnal mood variation; (3) anhedonia; (4) early morning awakening; (5) psychomotor agitation or retardation; (6) loss of appetite and weight; and (7) loss of libido. At least four symptoms must be definitely present to diagnose somatic syndrome.

World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders; Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992, p. 120.

43.A. The most appropriate diagnosis for this lady would be depressive disorder. According to the hierarchical organization of diagnoses, depression will trump a diagnosis of anxiety disorder. In this case, all of the mentioned features are well accounted for by depression itself. This lady fulfils two major criteria required for the diagnosis of depression. A diagnosis of mixed anxiety and depression is not coded in ICD-10.

World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders; Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992, p. 119.

44.B. Social phobia is characteristically more pronounced in smaller group setting where close scrutiny and criticism are more likely. The age of onset is around 15, much younger than other phobias. Blushing is seen as a part of anxiety symptoms in social phobia. In some cases a fear of losing control and vomiting in public is noted. Avoidance of group settings may lead to impaired social performance.

World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders; Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992, p. 137.

45.A. Hypercortisolaemia is seen in nearly 50% of those with major depression. This is evident by measuring excretion of urinary-free cortisol or salivary cortisol. It is posited that the normal feedback inhibition of ACTH and CRH by cortisol is disturbed due to abnormal glucocorticoid receptors, leading to high persistent cortisol levels. Dexamethasone administration (DST) fails to stimulate the feedback loop and so fails to suppress the cortisol level. This is one of the most consistent and robust findings in depression. But it is not specific to depression – it is also noted to some extent in mania, schizophrenia, dementia, and other psychiatric disorders.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 531.

46.C. Life events are strong predictors of onset of depression. It is suggested that the association of life events and depression is stronger for the first episode than recurrences of depression. This may be because a kindling effect underlies depression. In other words, depression begets depression once the initial damage is done by a life event. It is not necessary that life events must precede the onset of depression in every patient.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 433.

47.C. In DSM-IV rapid cycling disorder is a course specifier while ICD-10 does not include this as a separate category or specifier. It can occur in both bipolar type I and bipolar type II disorders. Rapid cycling is diagnosed if there are at least four episodes fulfilling the criteria of major depression, mania, hypomania, or mixed mood disorder in the previous 12 months. Hypothyroidism is associated with rapid cycling bipolar disorder. Other causes of rapid cycling in a bipolar patient include the use of antidepressants that can induce switching, excessive use of stimulants including caffeine, non-compliance with medications, and presence of temporal lobe arrhythmias in EEG. It is more common in women, in those with bipolar II, and can have a familial tendency to occur. Of bipolar patients, 5–15% can have rapid cycling at some point in their lifetime.

Kupka RW, Luckenbaugh DA, Post RM, et al. Rapid and non-rapid cycling bipolar disorder: A meta-analysis of clinical studies. *Journal of Clinical Psychiatry* 2003; **64**: 1483–1494.

48. E. Good outcome in schizophrenia can be predicted by the presence of prominent affective symptoms during first presentation, acute onset, significant stressor at the onset, absence of family history of schizophrenia, good premorbid adjustment, having a family history of mood disorder, being female and living in a developing country.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 406; Box 19.6.

49. E. In atypical depression mood is depressed but affect remains reactive. Vegetative signs may be characteristically reversed with hypersomnia, hyperphagia, reversed diurnal mood variation, leaden paralysis (a peculiar heaviness in the limbs), and hypersensitivity to rejection. Cognitive distortions of typical depression may be absent. The characterization of this subgroup of depression is owed largely to an observation that the effects of MAO inhibitors such as phenelzine are better than other antidepressants in this population.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 268.

50. C. Heritability of bipolar disorder was estimated as 85% by McGuffin et al. Variable rates are reported in other studies. Currently, it is generally accepted that bipolar disorder is one of the most heritable psychiatric disorders.

McGuffin P, Rijsdijk F, Andrew M, et al. The heritability of bipolar affective disorder and the genetic relationship to unipolar depression. *Archives of General Psychiatry* 2003; **60**: 497–502.

51. B. Bipolar disorder starts with depression in up to 70% of patients. In a small proportion (10–20%) only recurrent mania is observed (still classed as bipolar under DSM); 90% of those who experienced mania are likely to have another, while the remaining 10% have only one episode of mania throughout their lifetime.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 550.

52. A. The concept tested here is that any patient who has psychotic features in a background of elated mood has mania irrespective of the duration criteria. Also remember that any patient with elation and psychosocial impairment that necessitates hospitalization is diagnosed to have mania and not hypomania according to DSM-IV, irrespective of the duration criteria. In the absence of psychotic symptoms or hospitalization, clinical features must last for at least 7 days before a manic episode can be diagnosed.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 427.

53. A. Delusions of all types can present in bipolar disorder, as they do in schizophrenia. Family history of affective disorders is not uncommon in patients with schizophrenia, invalidating this aspect as a strong feature to differentiate the two major psychoses. Cannabis use and religious hallucinations can also occur in bipolar disorder. Ever since Kraepelinian concept of dementia praecox was introduced, one reasonable, though not always reliable, feature that differentiates these two illnesses is the absence of interepisodic residual symptoms in bipolar disorder. In the majority of patients with schizophrenia significant impairment is noted even between full-blown psychotic episodes. But note that residual cognitive impairment is increasingly noted in euthymic bipolar patients.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 568.

54.A. Bipolar disorder has no gender variation in prevalence rates. Unipolar depressive disorder is more common in women of all ages compared to men. The only time in life where the incidence is equal or slightly higher in males is when depression is prepubertal, and this is rare. The gender gap narrows with advancing age and in geriatric population the incidence rates across the genders are very much closer than in early adult life. Rapid cycling is more common in women, for unknown reasons.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 429.

55.B. Bipolar is the most heritable of all psychiatric disorders. Apart from being a risk factor for the development of bipolar disorder, a family history of bipolar disorder increases the risk for any mood disorders. Overall, in families of patients with bipolar illness, unipolar depression is the most common expressed phenotype. Note that a significant proportion of these unipolar patients can later get a revised diagnosis of bipolar disorder. Thus the mood disorders do not breed true on their own. The heritability of schizophrenia is around 50–60%. Conduct disorders and alcoholism have lower heritability rates than the psychoses.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 532.

56.C. Double depression refers to an episode of major depression in a patient with dysthymia. Dysthymic disorder is distinguished from major depressive disorder using both severity and duration criteria. Dysthymic patients complain that they have always been depressed since childhood or adolescence. A patient with dysthymia is prone to get recurrent depression, and major depression of various severities can occur on top of dysthymia, leading to double depression. It is estimated that nearly 40% of patients with major depression actually have a double depression. The prognosis may be poor in double depression.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 565.

57.A. Antineuronal antibodies are produced by group A beta haemolytic streptococci infection. This damages caudate nucleus resulting in Sydenham's chorea. Also, patients with Sydenham's chorea often have obsessive and compulsive symptoms, emotional lability, and hyperactivity. This is a spectrum of paediatric autoimmune neuropsychiatric disorders associated with streptococcal infections (PANDAS). Guillain–Barré syndrome is an acute demyelinating disease of peripheral nerves.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 825.

58.D. Among various risk factors attributed to the aetiology of depression, family history, neuroticism, recent life stressor, and past history of depression have most evidence. Brown and Harris in a landmark study established high risk of depression in urban-living women with early maternal loss, lack of a confiding relationship, greater than three children under the age of 14 at home, and unemployment.

Patten SB. Are the Brown and Harris vulnerability factors risk factors for depression? *Journal of Psychiatry and Neuroscience* 1991; **16**: 267–271.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 698.

59.C. Patients with obsessions usually harbour their difficulties for a long time (often 5 to 10 years) before they present to a doctor. The ego-dystonic nature of obsessions results in anxiety and reduces help seeking and sharing of their secret illness. OCD has its origin in adolescence or childhood. But most patients do not seek help until they are in their twenties or thirties. Often the onset of depression brings OCD to clinical attention.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 824.

60.A. Probable pointers in this vignette suggesting a diagnosis of schizophrenia are: (1) age of onset and (2) ideas of ego alien thought insertion. Prodrome of psychosis may present with obsessional symptoms. Often it is difficult to differentiate OCD from schizophrenia in such presentations. But the useful pointers are: (1) ego-dystonic nature of obsessions may not be prominent in psychosis; (2) insight that the thoughts are one's own may not be seen in psychosis; (3) resistance to the obsessions may be conspicuously absent; and (4) content of obsessions may be bizarre, instead of the usual themes of safety, contamination, sex, violence, religion, etc.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 824.

61.B. Night terror is a sleep disorder seen mostly in children. It is a disturbance of slow wave non-REM sleep. Generally in NREM sleep, dreams cannot be fully recollected. When a patient wakes up from NREM sleep, he is often confused. A night terror is a dramatic episode where the patient screams, has autonomic arousal, appears confused but goes back to sleep without clear memory of the arousal the next morning. Though this is fairly common in children around age 7, a new onset sleep terror in adults should prompt neurological investigations to rule out epilepsy or brain damage. About 1 to 6% of children have the disorder. It is more common in boys and tends to run in families.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 785.

62.C. Irrational fears are common in childhood but most of them disappear by adolescence. Any irrational fear of certain objects or situations associated with strong avoidance behaviour prompts a diagnosis of phobia. Phobia can develop against any object/ place though certain phobias, for example animals or spider phobia, seem common and more recurring than others; this might have an evolutionary explanation (stimulus preparedness).

World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders; Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992, p. 138.

63.C. Blood injury injection phobia is different from other phobias in two important aspects: (1) the autonomic response to exposure is low blood pressure, bradycardia, and fainting response instead of the more common tachycardia, increased blood pressure, and flight response; and (2) there is a strong genetic component in the aetiology of blood injury injection type of phobia. The affected persons may have inherited a particularly strong vasovagal reflex, which becomes associated with phobic emotions.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 600.

64.B. Emotional numbing when undergoing the trauma is associated with later risk of developing PTSD. PTSD occurs after exposure to stressful event of exceptionally threatening or catastrophic nature. But not everyone who is exposed to such situations develops PTSD. Predisposing factors may include pre-existing neuroticism, genetic predisposition (one-third of the variance is explained by genes), and hypocortisolæmia apart from an abnormal hippocampal response to stress.

Feeley NC et al. Exploring the roles of emotional numbing, depression, and dissociation in PTSD. *Journal of Traumatic Stress* 2000; **13**: 489–498.

65. E. Panic attacks have an autonomic arousal component with sweating, palpitation, trembling or shaking, shortness of breath or smothering, feeling of choking, nausea, and dizziness. A cognitive component is characterized by fear of going mad, losing control, fear of dying, derealization and depersonalization. The most characteristic type of panic attack is the spontaneous (out of the blue) episode. Situational panic attacks occur when exposed to or anticipating an exposure to a particular situations. Occasionally, some individuals have panic attacks in certain situations sometimes but not always – these are called situationally predisposed panic attacks. Nocturnal panic attacks are common in patients with panic disorder. They are similar to panic attacks that occur in daytime. Isolated, nocturnal panic attacks are rare and must prompt investigations to rule out medical causes. Especially in case of non-fearful panic attacks where cognitive components are absent, one should suspect medical causes. There is nothing called unilateral panic attack!

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 807.

66. C. Behavioural inhibition to the unfamiliar is a temperamental construct that refers to a characteristic propensity to react to both social and non-social novelty with inhibition. In contrast, shyness refers to feelings of discomfort in social situations but not non-social situations. Extreme behavioural inhibition is also denoted as neophobia. Some children have a consistent pattern of behavioural inhibition, especially if parents have an anxiety disorder themselves. This may grow into social phobia in at least some.

Van Ameringen M et al. The relationship of behavioral inhibition and shyness to anxiety disorder. *Journal of Nervous and Mental Disease* 1998; **186**: 425–431.

67. A. Panic disorder has higher prevalence in females than males at a ratio of 3:2 in community samples and 3:1 in clinical samples. The onset of panic disorder falls into two peaks – the first occurs in the early to mid-twenties (15–24 years) with a second peak at around 50 (45–54 years). The onset of panic disorder for the first time in elderly people is extremely rare.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 811.

68. D. The phenomenology of grief is very similar to depression, but some important differentiating features exist. For example though all features of somatic syndrome, guilt regarding the death, and preoccupation with the unfortunate event occurs in normal grief, recurrent suicidal ideas, psychomotor retardation, inappropriate guilt not pertaining to the loss, and psychotic symptoms other than transient visual hallucination of the loved one are unusual. These symptoms, if present, warrant a diagnosis of abnormal grief/ major depressive episode.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1144.

69. E. Brown and Harris, in a landmark study, established the high risk of depression in urban-living women with early maternal loss, lack of a confiding relationship, greater than three children under the age of 14 at home, and unemployment. Though urban living is not quoted as one of the four identified factors, it is important to note that the study was carried out in Camberwell, an inner city area with high deprivation rates.

Patten SB. Are the Brown and Harris vulnerability factors risk factors for depression? *Journal of Psychiatry and Neuroscience* 1991; **16**: 267–271.

70. A. According to ICD-10 criteria for PTSD to be diagnosed the cluster of hyperarousal, flashbacks, irritability and intrusive memories must occur within 6 months of the traumatic event. A diagnosis of probable PTSD can be made after 6 month's interval. This is largely an arbitrary cut off without much difference in clinical features of the two groups.

World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders: Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992, p. 148.

71. D. It is observed that about 20–30% of those with OCD show a significant improvement, 40–50% have a moderate improvement, while the rest have a chronic or worsening course. Poor prognostic factors include yielding to compulsions, a childhood onset, bizarre content of compulsions, need for hospitalization, a coexisting major depressive disorder, the presence of overvalued ideas, and the presence of personality disorder (especially schizotypal). A good prognosis is indicated by good premorbid adjustment, the presence of a precipitating event, and episodic nature. The content or theme of obsessions and family history do not relate to the prognosis.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 824.

72. A. The most common method of self harm attempt in the UK is paracetamol overdose. In the UK, self poisoning by drugs accounts for nearly 90% all hospital presentations with self harm. The next most common method of self harm is cutting wrists. The most common method employed in those successfully committing suicide is hanging. In general, violent methods such as hanging or use of firearms are common among male victims of suicide. Self immolation is associated with schizophrenia, south Asian women, and combined suicide–homicides. Presence of mental illness increases the severity of suicide attempt. Tricyclic antidepressant-related death was more common in the past but has reduced following a reduction in prescriptions.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 671.

73. C. Sixty-six percent of suicide victims are seen by their general practitioner in the month prior to suicide. Nearly 40% have seen their GP in the week preceding death. One-quarter of suicide victims are on an active psychiatric out-patient list at the time of death. Half of these have seen their psychiatrists in the week preceding death.

Appleby L, Shaw J, Amos T, et al. *Safer Services. Report of the National Confidential Inquiry into Suicide and Homicide by People with Mental Illness*. London: Department of Health, 1999.

74. D. Features of paranoid personality disorder include pervasive distrust and suspiciousness, reading hidden self-referential meaning from benign events, bearing grudges persistently, and a tenacious sense of personal rights and suspicion of infringement on those rights leading to quarrelsome and litigious tendency.

World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders; Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992, p. 203.

75. C. Patients with schizoid personality display a pervasive pattern of detachment from social relationships and a restricted range of emotional expression. They do not desire close relationships and prefer to be solitary with almost absent sexual interest. They lack close confidants and appear indifferent to both praise and criticism by others. Inability to plan ahead is seen in antisocial personality, while borderline and avoidant personalities show sensitivity to rejection. Narcissistic individuals may have a sense of excessive self importance. Impulsivity and lack of self restraint are seen in both antisocial and borderline personality disorders.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 929.

76.A. Histrionic personality disorder is characterized by a high degree of attention-seeking behaviour, craving for attention, and sexualizing and seductive behaviour even in professional or non-social settings. These patients tend to have rather superficial relationships. They tend to display rapidly shifting and shallow expression of emotions. In addition, they have a style of speech that is excessively impressionistic and lacking in detail with self-dramatization and artificially exaggerated emotional expression. They may be highly suggestible too. People with narcissistic personality are not particularly attention seeking in their behaviour. But similar to those with histrionic traits, individuals with narcissistic traits have shallow expression of emotions. In addition, they have a strong need for admiration together with a sense of self importance. Body image disturbances are seen in those with borderline personality traits, along with disturbed self identity. But excessive concern with physical appearance is not characteristic of borderline personality.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 802.

77.A. The characteristic behaviour of the avoidant personality is active isolation from the social environment. But in contrast to schizoid personality, where passive social isolation is seen, avoidant patients isolate to protect themselves because they are extremely sensitive to rejection. Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 942.

78.A. Borderline personality disorder is characterized by affective instability, impulsivity, chronic emptiness, sensitivity to rejection resulting in intense relationships that are often short lived, and micropsychotic episodes induced by stressful events. It is increasingly speculated that borderline disorder exists in a spectrum which at its most severe pole includes bipolar illness. Various observations provide preliminary support to this claim. Family history of bipolar illness is more common in borderline personality disorder; development of bipolar illness on follow up is higher in borderline than any other personality disorders; affective instability and impulsivity are important features of both borderline disorder and bipolar illness.

Magill CA. The boundary between borderline personality disorder and bipolar disorder: current concepts and challenges. *Canadian Journal of Psychiatry* 2004; **49**: 551–556.

79.C. The relationship between obsessive-compulsive personality disorder and obsessive-compulsive disorder is controversial. Though it was suggested that most obsessive-compulsive personality disorder become obsessive-compulsive disorder in later life, recent studies refute this. Among various psychiatric disorders that may present in a patient with obsessive personality, depressive and anxiety disorders are the most common, followed by phobic, somatoform, and obsessive-compulsive symptoms.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 945.

80. B. Most patients with schizophrenia who commit suicide are in an acute phase of psychosis, have a history of previous attempt, achieve poor symptom control, have a high degree of comorbidity, and show greater non-compliance. For several decades, the literature has quoted the lifetime risk of suicide in schizophrenia as 10–15% (from Miles *et al.* who examined mortality reports published between 1931 and 1975, and estimated the lifetime risk to be 10%). This figure was subsequently challenged by Inskip *et al.* who analysed 29 studies using proportionate mortality (the percentage of the dead who died by suicide) and estimated the risk to be substantially lower at 4%. A recent meta-analysis by Palmer *et al.*, using more rigorous methods, has concluded that the rate of suicide in schizophrenia is around 5.6%.

Palmer BA, Pankratz VS, and Bostwick JM. The lifetime risk of suicide in schizophrenia: a reexamination. *Archives of General Psychiatry* 2005; **62**: 247–253.

Miles CP. Conditions predisposing to suicide: a review. *Journal of Nervous and Mental Disease* 1977; **164**: 231–246.

Inskip HM, Harris EC, Barraclough B. Lifetime risk of suicide for affective disorder, alcoholism and schizophrenia. *British Journal of Psychiatry* 1998; **172**: 35–37.

81. A. It was widely believed that schizophrenia is a universal illness with a more or less equivalent global prevalence of 1%. McGrath and colleagues have recently challenged this figure. Compiling data from nearly 200 studies that reported on epidemiology of schizophrenia, they estimated the mean lifetime prevalence of schizophrenia (the proportion of individuals in the population who have ever manifested the illness and who are alive on a given day) as 4 per 1000. Note that DSM-IV states that the lifetime prevalence of schizophrenia is often reported to be 5 to 15 per 1000. McGrath and colleagues also determined that the point prevalence of schizophrenia (the proportion of individuals who manifest the illness at a given point of time) is 4.6 per 1000. The lifetime morbid risk of schizophrenia (the probability of a person developing the illness during his or her lifetime) is determined to be at a rate of 7 per 1000 (nearly 1 in 150 as mentioned in the question).

Saha S, Chant D, Welham J, and McGrath J. A systematic review of the prevalence of schizophrenia. *PLoS Medicine*; **2**: e141 doi:10.1371/journal.pmed.0020141.

82. B. Narcolepsy is characterized by irresistible attacks of sleep together with cataplexy (brief episodes of sudden bilateral loss of muscle tone, often in association with intense emotion) and recurrent hypnopompic or hypnagogic hallucinations or sleep paralysis at the beginning or end of a sleep episode. Characteristically, the EEG shows REM pattern during hypnagogic or hypnopompic hallucinations and sleep paralysis. The narcoleptic sleep is usually a refreshing (REM) sleep. Sleep onset REM is characteristic. Strong genetic association with HLA-DR2 locus is noted, with an autosomal dominant inheritance. HLA-DR2 is found in 90 to 100% of patients with narcolepsy. It is also shown that patients with narcolepsy are deficient in the neurotransmitter hypocretin (also called orexin) associated with hypothalamic modulation of appetite and alertness. EEG is normal between narcoleptic attacks.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 760.

83. B. Sleepwalking or somnambulism consists of various complex motor behaviours during the first third of sleep where slow wave NREM (stage III and IV) phase predominates. Usually, the patient will not retain any memory of getting up and walking during sleep. The motor acts are often perseverative in nature; incidence is most common around age 12.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 767.

84. C. Both mania and depression are characterized by various neurovegetative signs – disturbances in sleep, appetite, weight, energy levels, and circadian functions. In depression early morning awakening is characteristic. To qualify as early morning awakening, a patient must wake up at least 2 hours prior to his usual waking time. In mania, there is increased energy associated with reduced need for sleep. Patients can go on for many days with barely any sleep. Paradoxically, sleep deprivation itself can induce a state similar to hypomania in some susceptible individuals.

World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders; Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992, p. 114.

85. D. Panic attacks can occur in various medical conditions such as hyperthyroidism, phaeochromocytoma, epilepsy, cardiac arrhythmias, and chronic obstructive pulmonary disease. It is also noted that some medical conditions occur slightly more commonly in those with panic disorder; for example mitral valve prolapse, hyperthyroidism.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 810.

86. A. Bulimia nervosa and anorexia nervosa are not mutually exclusive disorders. Significant overlap occurs between the two and also with EDNOS (eating disorder not otherwise specified). In bulimia, more impulsivity and less perfectionist traits are noted. Bulimia nervosa is characterized by higher rates of partial and full recovery compared with anorexia nervosa. Both anorexia and bulimia cannot be diagnosed at the same time as a range of bulimic behaviours are described under the diagnosis of anorexia itself.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 498.

87. A. In some elderly patients with depression, marked difficulties with concentration and memory can present similar to dementia. Presence of previous history of depression; clearly observable depressed mood; biological symptoms of depression; voluntary complaints about memory failure (patients with dementia tend not to realize their own memory problems); indifference and 'I don't know' answers when formally testing memory (while confabulation may be seen in dementia); and response to antidepressant medication (unusual in true dementia) are some clues to pseudodementia. In cognitive tests, visuospatial and executive functions can be impaired in dementia but such impairment is highly unlikely to be due to isolated depression. Neurological signs, including frontal release, points towards dementia.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 339; Table 10.3–11.

88. D. Paraphrenia is a late-onset psychotic disorder characterized by persecutory and referential delusions with or without auditory hallucinations. It is believed to be a very-late-onset (>60) variant of schizophrenia as many patients with a family history of schizophrenia show an increased rate of paraphrenia. Negative symptoms are conspicuously absent in paraphrenia. Schneiderian first-rank symptoms are uncommon too.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1642.

89. D. According to DSM-IV-TR, dissociative identity disorder (multiple personality disorder) is characterized by the presence of two or more distinct identities or personality states that recurrently take control of the individual's behaviour. The patient cannot recall important personal information that occurs when the alternate personality is in control (one-way amnesia). The personality states are also called alters. Often alters are widely different in their perception, relation, and adaptation to the environment and self. This controversial and dramatic condition is placed under dissociative disorders in both ICD and DSM.

World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders; Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992, p. 160.

90. D. Dissociative fugue is characterized by sudden, unexpected but purposeful travel away from one's routine dwelling, associated with amnesia for strikingly significant periods of the past. This may be associated with assumption of a new identity. Though this can occur in depression, it is more often seen as stress-induced dissociation state. Depersonalization is not a characteristic accompaniment. Family history of epilepsy in a patient with fugue state must prompt investigations for TLE. Usually, patients with fugue have no anterograde amnesia or attention difficulties and have apparently good self care and social interaction.

World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders; Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992, p. 155.

91. E. In chronic fatigue syndrome (also called myalgic encephalomyelitis or postviral fatigue; described as neurasthenia in ICD-10) the central feature is severe fatigue which is not related to level of exertion and unrelieved by rest. This is accompanied by aching muscles, insomnia, aching joints, and irritability. Patient may complain of sore throat, fever, and tender lymph nodes, especially, retrospectively, around the time of onset.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1113.

92. D. There are important conceptual differences between somatization disorder and hypochondriasis. In hypochondriasis the patient dreads the presence of an undiagnosed disorder. He seeks diagnosis more than treatment. The patient asks for various unwarranted diagnostic tests but will not be satisfied by any negative results. A patient with somatization is not concerned about diagnosis as much as she is concerned about symptom relief and intervention. Various sophisticated diagnostic measures are not sought usually. Instead, various treatments may be tried by both patients and health-care professionals.

World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders; Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992, pp. 162, 164.

93. E. Multiple sclerosis can present with discrete neurological dysfunctions separated in both time and bodily location. These symptoms often resolve on their own (relapsing-remitting course). For example, as in this case, bladder dysfunction and limb weakness. Conversion disorder also presents with neurological dysfunction (often 'loss of function' as opposed to somatoform disorder where there is a 'positive' symptom such as pain) which can resolve on its own, on resolution of a conflict.

World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders; Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992, p. 158.

94. C. Past history of suicidal attempt is the most important predictor of risk. Other risk factors include family history of suicide, history of a major mental illness, low socioeconomic status, postdischarge period, severe physical illness, and easy access to lethal methods.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1035.

95. B. This is a difficult question; questions of this type are best answered at their face value, with only the given information and without making any further assumptions. Patient A has obsessional symptoms with no other pathology highlighted. As such, the risk of suicide is low in OCD without depression. Patient C has the risk factor of alcohol use, but the rest of the history (female, young, sought help, impulsive) suggests low risk. Patients D and E seem to have no suicidal intention. Patient B has various risk factors – middle aged, male, had a violent attempt, and a widower.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1035.

96.A. A major depressive episode is found in approximately 10% of patients, while nearly 50 to 75% show some features of subclinical depression. Depression reported by carers can range up to 85%. Depression is more common in the early than in the later stages of AD – this may be due to preserved insight during early stages or because of the fact that clinical assessment of depression becomes more difficult when dementia worsens.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 389.

97.A. Malingering is often not considered seriously in general clinical practice. Though it may be difficult to establish, it should be suspected whenever obvious discrepancies exist in historical accounts and observed signs. Amnesia for the content of hallucinatory voices is distinctly unusual.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1129.

98.B. Kleine–Levin syndrome is characterized by recurrent episodes of prolonged sleep intermingled with periods of normal sleep. During the prolonged sleep phases, social withdrawal, apathy, irritability, and megaphagia (increased eating) can occur. Unexplained fever may occur in such patients. This is a rare illness with onset between the ages of 10 and 21 years. It is mostly self-limiting. Curiously, this is a favourite theme tested in MRCPsych exams!

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 765.

99.D. REM behavioural disorder refers to episodes of complex, sometimes violent acting out of dreams. It is common in older men with a history of brain ischaemia. It can appear as an early event in the evolution of Parkinson's disease or Lewy body dementia. Polysomnography shows failure of normal REM related hypotonia.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 768.

100.C. Absence seizures can mimic thought blocking. Absence seizure is a type of generalized seizure where the episodes may often go unnoticed due to a lack of dramatic motor or sensory symptoms. Also called petit mal epilepsy, it usually begins in childhood and stops by puberty. A patient with absence seizures has a very brief loss of consciousness which can occur numerous times in a single day (up to 100 in some cases). EEG produces a characteristic pattern of three-per-second spike-and-wave.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 360.

- 1. Description and categorization of abnormal experiences as reported by the patient and observed from his behaviour is known as**
 - A. Experimental psychopathology
 - B. Descriptive psychopathology
 - C. Explanatory psychopathology
 - D. Philosophical psychiatry
 - E. None of the above

- 2. A 55-year-old man with chronic schizophrenia resists any passive limb movements attempted during a neurological examination, in spite of being asked not to do so. Which of the following symptom is he exhibiting?**
 - A. Obstruction
 - B. Negativism
 - C. Automatic obedience
 - D. Waxy flexibility
 - E. Ambitendency

- 3. According to Jaspers, the most important component of psychiatric assessment is**
 - A. Empathy
 - B. Humour
 - C. Judgement
 - D. Reasoning
 - E. Common sense

- 4. The concept of symptoms assessed by descriptive psychopathology has both form and content as its components. Which of the following, with regard to this statement, is true?**
 - A. Form provides sufficient information for management
 - B. Form provides sufficient information for severity
 - C. Form is more important than content
 - D. Form provides sufficient information for diagnosis
 - E. Content is more important than form

- 5. A patient is experiencing increased brightness and acuity of visual objects. Intense perceptions occur in all of the following EXCEPT**
- A. Migraine
 - B. Hallucinogens
 - C. Mania
 - D. Delirium
 - E. Depression
- 6. A 35-year-old lady complains of changes in the shape of objects perceived. She is having difficulties in perceiving the symmetry of objects. This symptom is called**
- A. Dysmegalopsia
 - B. Micropsia
 - C. Macropsia
 - D. Lilliputian hallucinations
 - E. Pareidolia
- 7. A 12-year-old boy, at a school anniversary celebration, vividly describes what martians may look like. Which of the following is true about this imagery? The imagery is**
- A. A perception
 - B. A fantasy
 - C. A pseudohallucination
 - D. An illusion
 - E. None of the above
- 8. An 8-year-old boy is frightened to be alone at home. He starts seeing monsters out of wind moving through window curtains. Which of the following symptoms is he experiencing?**
- A. Pareidolia
 - B. Completion illusion
 - C. Eidetic imagery
 - D. Affect illusion
 - E. Hallucination
- 9. A 19-year-old man sees his new girlfriend's face from the shapes of clouds. This perception will**
- A. Intensify on paying attention
 - B. Cannot be dismissed voluntarily
 - C. Arises from unambiguous stimuli
 - D. Associated with intense affect change
 - E. Associated with loss of insight

- 10. A 35-year-old lady reports hearing voices in her head.Which of the following differences between hallucination and pseudohallucination is true?**
- A. In true hallucinations insight is often retained
 - B. True hallucinations are often identified to be originating from self
 - C. True hallucinations occur in subjective space
 - D. True hallucinations are sought in other modalities by the patient
 - E. True hallucinations cannot occur in two modalities simultaneously
- 11. Which one of the following is an elementary hallucination?**
- A. Flashes of light
 - B. Visions of small mice in a minutiae
 - C. Voices repeating the word 'go'
 - D. Voices speaking in an unknown language
 - E. None of the above
- 12. Which of the following is NOT a common feature of schizophrenic auditory hallucinations?**
- A. Being multiple
 - B. Male voice
 - C. Speaks in one's mother tongue
 - D. Often continuously present
 - E. Has a different accent
- 13. Which of the following can cause visual hallucinations?**
- A. Occipital lobe tumours
 - B. Postconcussion states
 - C. Hepatic failure
 - D. Dementia
 - E. All of the above
- 14. An 80-year-old lady with normal consciousness experiences vivid, distinct, colourful images of Mickey Mouse in her living room. On physical examination one must look for which of the following signs?**
- A. Visual acuity
 - B. Glasgow coma scale
 - C. Plantar reflex
 - D. Knee jerk
 - E. Cranial nerves
- 15. A patient withdrawing from alcohol sees small Chinese soldiers marching on his carpet.This phenomenon is called**
- A. Micropsia
 - B. Macropsia
 - C. Lilliputian hallucination
 - D. Pseudohallucination
 - E. Affective illusion

- 16. A 22-year-old college student reports a peculiar visual disturbance that causes images to persist even after their corresponding stimulus has ceased. Which of the following symptoms best suits the above description?**
- A. Pareidolia
 - B. Palinopsia
 - C. Autoscopy
 - D. Imagery
 - E. Formication
- 17. A 54-year-old man who is living at a psychiatric rehabilitation home complains of seeing his own image outside his body. Which of the following is the commonest psychiatric cause of this phenomenon?**
- A. Schizophrenia
 - B. Temporal lobe epilepsy
 - C. Depression
 - D. Mania
 - E. Dementia
- 18. Which of the following drugs on withdrawal produce disturbed proprioceptive perceptions?**
- A. Cannabis
 - B. Amphetamines
 - C. LSD
 - D. Benzodiazepines
 - E. Nicotine
- 19. A patient, whose right arm was amputated following a crush injury, suffers from recurrent, tactile sensations arising out of the lost limb. Which of the following symptoms is this description classified as?**
- A. Hallucination
 - B. Pseudohallucination
 - C. Body image disturbance
 - D. Somatization
 - E. Delusion
- 20. Which of the following is an extracampine hallucination?**
- A. A 45-year-old man hears voices coming from the South Pole
 - B. A 33-year-old man hears a voice coming from his left knee
 - C. A 56-year-old lady sees a devil's tail hanging on a hook
 - D. A 31-year-old man sees an angel without a face
 - E. None of the above

- 21. A patient can hear voices when ever the noise of water running through a tap is heard. This is called**
- A. Reflex hallucination
 - B. Synaesthesia
 - C. Functional hallucination
 - D. Extracampine hallucination
 - E. Reverse hallucination
- 22. The phenomenon of perceiving a stimulus of one modality in a different modality is called**
- A. Reflex hallucination
 - B. Synaesthesia
 - C. Functional hallucination
 - D. Extracampine hallucination
 - E. Reverse hallucination
- 23. An 18-year-old girl is able to perceive colours when she listens to cello music. Which of the following is incorrect regarding synaesthesia?**
- A. It is more common in females
 - B. It often occurs in multiple members of a family
 - C. Colour-number synaesthesia is the most common type.
 - D. It is related to defective synaptic pruning
 - E. It is a form of hallucination
- 24. Which one of the following is NOT matched correctly?**
- A. Form of thought – loosening of association
 - B. Content of thought – persecutory belief
 - C. Stream of thought – poverty of speech
 - D. Form of thought – obsessions
 - E. Form of thought – circumstantiality
- 25. Which one of the following is more common in manic rather than schizophrenic speech disturbance?**
- A. Clanging
 - B. Derailment
 - C. Thought blocking
 - D. Tangentiality
 - E. Poverty of content of speech
- 26. A 66-year-old man tends to repeat the same answer for all subsequent questions. This is pathognomonic of**
- A. Schizophrenia
 - B. Organic brain damage
 - C. Mixed affective state
 - D. Conversion disorder
 - E. Stuttering

- 27. Obsessions are intrusive and repetitive mental phenomenon. In which of the following forms can an obsession occur?**
- A. Thoughts
 - B. Words
 - C. Images
 - D. Impulses
 - E. All of the above
- 28. Obsessions are appreciated to be against values and ideals of self. Which of the following terms corresponds to this description?**
- A. Ego-dystonic
 - B. Ego-syntonic
 - C. Ego-ideal
 - D. Ego-neutral
 - E. Ego-ridden
- 29. Passivity phenomena can occur as any of the following EXCEPT**
- A. Thought insertion
 - B. Thought withdrawal
 - C. Thought broadcasting
 - D. Thought blocking
 - E. None of the above
- 30. Which of the following is NOT a first-rank symptom of schizophrenia?**
- A. Thought echo
 - B. Somatic hallucinations
 - C. Delusional perception
 - D. Thought withdrawal
 - E. Made volition
- 31. Which of the following statements with regard to first-rank symptoms is incorrect?**
- A. It is a comprehensive list of schizophrenic symptoms
 - B. It emphasizes form not content
 - C. It has clearly identifiable features
 - D. They are seen more often in schizophrenia than other psychosis
 - E. They are not essential for diagnosis
- 32. A patient suffers from an osteoarthritic knee pain, but he believes it is caused by 'the leader of a cybernetic extermination gang' in an attempt to robotize him. Which of the following symptoms is he exhibiting?**
- A. Somatic hallucination
 - B. Somatic passivity
 - C. Somatization
 - D. Body image disturbance
 - E. Delusional perception

33. Various dimensions of delusional experience include all EXCEPT

- A. Distress
- B. Loss of insight
- C. Preoccupation
- D. Conviction
- E. Callousness

34. Which of the following is NOT a primary delusion?

- A. Delusional mood
- B. Delusional memory
- C. Delusional perception
- D. Delusional intuitions
- E. Delusional misinterpretation

35. A 44-year-old man is taken into police custody for harassing his wife. He is convinced that she is having an affair but in fact, she isn't. Which of the following disorders cannot explain the above presentation?

- A. Alcohol dependence
- B. Misidentification syndrome
- C. Delusional disorder
- D. Schizophrenia
- E. Dementia

36. A 65-year-old woman believes that she is already dead. Similar delusions are reported in which of the following diseases?

- A. Schizophrenia
- B. Depressive psychosis
- C. Late-onset depression
- D. Organic disorders
- E. All of the above

37. Mr Spencer is a loving and caring husband of Martha. When Martha is pregnant, Mr Spencer develops symptoms of bloating, pelvic pain, and morning sickness. The main psychopathology in the above presentation is

- A. A conversion symptom
- B. Delusion
- C. Hypochondriasis
- D. Body image disturbance
- E. Hallucination

- 38. A 72-year-old lady complains of being infested with body lice. Her dermatologist could not find any signs of infestation but she insists that she could feel the lice moving on her skin and brings a matchbox full of skin scrapings for examination. Which of the following descriptions is most appropriate?**
- A. Obsession of contamination
 - B. Compulsive skin picking
 - C. Factitious dermatitis
 - D. Somatization
 - E. Ekbom's syndrome
- 39. Which of the following is not a delusional misidentification?**
- A. Reduplicative paramnesia
 - B. Cotard's syndrome
 - C. Capgras' syndrome
 - D. Fregoli's syndrome
 - E. Intermetamorphosis
- 40. Which of the following is FALSE with respect to Doppelganger?**
- A. It is an ideational rather than a perceptual disturbance
 - B. It is known as double phenomenon
 - C. It can occur in the absence of mental illness.
 - D. It is a delusion of misidentification
 - E. None of the above
- 41. A patient feels very anxious leaving home. He feels people in the street are watching him and feels very self-conscious about what he does. He tries to interpret different gestures he could see others making in his presence. Which one of the following suits this description best?**
- A. Sensitive ideas of reference
 - B. Agoraphobia
 - C. Delusions of persecution
 - D. Specific phobia
 - E. Delusions of reference
- 42. Overvalued ideas are NOT noted in the core symptoms of which one of the following disorders?**
- A. Body dysmorphic disorder
 - B. Anorexia nervosa
 - C. Morbid jealousy
 - D. Trans-sexualism
 - E. PTSD

43. Which one of the following is not a type of normal thinking process?

- A. Autistic thinking
- B. Dereistic thinking
- C. Fantasy thinking
- D. Rational thinking
- E. Desultory thinking

44. In formal thought disorder, asyndesis refers to which of the following?

- A. Lack of genuine causal links in speech
- B. Lack of information in speech
- C. Lack of logical arguments in speech
- D. Lack of wide vocabulary in speech
- E. Lack of adjectives in speech

45. A patient who has taken lithium for some months discontinues it and says ‘the ocean needs a sail as rat needs a tail, so write your exam and don’t fail, results will be out in a mail’. Which of the following symptoms is he exhibiting?

- A. Rhyming
- B. Punning
- C. Neologisms
- D. Pressured speech
- E. Metonymy

46. Analyse the following speech sample and choose the appropriate description. ‘The whirl of Susan’s life, it’s me... and I want to whirl happily. Stop all medicine, I will get more whirl every night. No doctor has the whirl to help...always liars...This whirl is full of mad people.’

- A. Metonymy
- B. Neologism
- C. Verbigeration
- D. Paraphasia
- E. Stock word

47. Which of the following psychopathological features could be diagnosed using sorting tests?

- A. Overinclusion
- B. Verbigeration
- C. Echolalia
- D. Acalculia
- E. Anosognosia

- 48. Analyse the following speech sample and choose appropriate description.**
**'Q: How many legs does a dog have? A: Five. Q: What comes after Saturday?
A: Tuesday.'**
- A. Vorbeireden
 - B. Mitgehen
 - C. Tangentiality
 - D. Circumstantiality
 - E. Stock words
- 49. Which of the following is associated with circumstantiality?**
- A. Figure ground failure
 - B. Affective changes
 - C. Malingering
 - D. Filling memory gaps
 - E. None of the above
- 50. In pure word deafness, which one of the following is impaired?**
- A. Reading
 - B. Writing
 - C. Speaking
 - D. Comprehension
 - E. Source localization
- 51. Goldstein is associated with which of the following modes of thinking?**
- A. Desultory thinking
 - B. Over inclusive thinking
 - C. Illogical thinking
 - D. Concrete thinking
 - E. All of the above
- 52. Bannister repertory grid can be used to measure which of the following phenomena?**
- A. Poverty of thought
 - B. Psychomotor retardation
 - C. Formal thought disorder
 - D. Lack of empathy
 - E. Lack of imagination
- 53. Which of the following can be used to assess formal thought disorder in schizophrenia?**
- A. Cloze procedure
 - B. Type–token ratio
 - C. Word association tests
 - D. Cohesion analysis
 - E. All of the above

54. Which of the following is a psychopathology of familiarity?

- A. Déjà vu
- B. Confabulation
- C. Pseudologia
- D. Parapraxis
- E. Paraphasia

55. Which one of the following is described as a core symptom of Ganser's syndrome?

- A. Pseudohallucinations
- B. Approximate answers
- C. Somatic symptoms
- D. Indifference
- E. Lack of remorse

56. Loss of insight is a common feature in schizophrenia. Which of the following neurological symptoms is comparable to loss of insight?

- A. Object agnosia
- B. Simultagnosia
- C. Anosognosia
- D. Amnesia
- E. Apraxia

57. Patients that complain of unusual symptoms, using the words 'as if', are most likely to have which of the following phenomena?

- A. Déjà vu
- B. Jamais vu
- C. Depersonalization
- D. Formication
- E. Rumination

58. A 43-year-old widow presents to the clinic with vague complaints. She is unable to express her emotions verbally. Difficulty in differentiating bodily sensation from emotional state is characteristic of patients with which of the following?

- A. First-rank symptoms
- B. Loss of insight
- C. Frontal lesions
- D. Somatization
- E. Alcohol dependence

59. Pathological gambling is considered as a part of which of the following cluster of symptoms?

- A. Malingering
- B. Overvalued ideas
- C. Impulse control symptoms
- D. Manic symptoms
- E. Antisocial traits

60. A 43-year-old widow presents to the clinic with vague complaints. She is unable to express her emotions verbally. Which of the following symptoms is LEAST likely to be seen in this lady?

- A. Diminution of fantasy
- B. Reduced symbolic thinking
- C. Literal thinking concerned with details
- D. Difficulties in recognizing ones own feelings
- E. Amnesia for traumatic events in the past

61. Near death experiences are related to which of the following phenomenology?

- A. Passivity
- B. Possession
- C. Autoscopy
- D. Alienation
- E. Reincarnation

62. Mutism is a catatonic sign. Which of the following with regard to mutism is true?

- A. Patient can speak but not coherently
- B. Patient can comprehend but cannot speak
- C. Patient can make non-verbal sounds to communicate
- D. Patient cannot move her vocalizing muscles
- E. Patient can neither comprehend nor speak

63. Astasia-abasia is associated with which one of the following disorders?

- A. Multiple sclerosis
- B. Motor neurone disease
- C. Sarcoidosis
- D. Dissociation disorder
- E. Delusional disorder

64. Which one of the following patients CANNOT experience hallucinations?

- A. 12-year-old boy with no mental illness
- B. 34-year-old man with IQ of 45
- C. 23-year-old man who is deaf and mute
- D. 47-year-old lady with bilateral acoustic neuroma
- E. None of the above

- 65. A 32-year-old carpenter starts believing that his new laptop is sending him infrared signals. Which of the following processes **CANNOT** explain the development of the above belief?**
- A. Jumping to conclusions
 - B. Theory of mind defect
 - C. Attributional bias
 - D. Defective probabilistic reasoning
 - E. Subvocal motor activation
- 66. Which of the following is considered to be the most important difference between primary and secondary delusions?**
- A. Preceding mental phenomenon
 - B. Time of onset
 - C. Associated distress
 - D. Degree of impairment
 - E. None of the above
- 67. A 65-year-old housewife is admitted to a hospital in Durham following a head injury. She claims that the same hospital has an extension that runs into Dundee, and she could be in Dundee at the same time as she is in Durham. Which of the following entities should be considered in her presentation?**
- A. Schizophrenia
 - B. Delusional disorder
 - C. Reduplicative paramnesia
 - D. Dementia
 - E. Multiple personality disorder
- 68. Disorientation of age seen in schizophrenia is more common in which of the following patient groups?**
- A. Acute episode
 - B. Younger age
 - C. Female patients
 - D. Chronic schizophrenia
 - E. Associated delirium
- 69. Double orientation is a phenomenon seen in chronic schizophrenia. It refers to which of the following?**
- A. Visual splitting
 - B. Oriented to time but not place and person
 - C. Having delusional orientation separate from reality
 - D. Intermingled delusional and real life orientation
 - E. None of the above

70. Your pharmacist has asked you to reduce or change antipsychotic prescriptions to an inpatient as he has developed akathisia. Akathisia refers to which of the following descriptions?

- A. Poor attention span
- B. Recurrent violent impulses
- C. Restlessness without autonomic features
- D. Anxiety characterized by cognitive and somatic features
- E. Fidgety, shuffling gait

71. Which of the following is not a catatonic symptom?

- A. Posturing
- B. Negativism
- C. Ambitendance
- D. Astasia-abasia
- E. Mitgehen

72. Which of the following statements accurately differentiates catatonic rigidity from neurological spasticity?

- A. Tone normalizes for voluntary acts in catatonia
- B. Tremors are superimposed in spasticity
- C. Catatonia is generalized not specific to a muscle group
- D. Small muscles are not affected by catatonia
- E. Catatonia disappears while sleeping

73. Which of the following differentiates the anhedonia seen in depression versus anhedonia seen in chronic schizophrenia? Anhedonia differs in

- A. Quality
- B. Severity
- C. Mode of onset
- D. Chronicity
- E. Insight

74. Folie a deux is characterized by which of the following clinical descriptions?

- A. Two persons having the same diagnosis
- B. Twins having the same psychotic illness
- C. Two persons sharing delusional content
- D. Two delusions with the same theme
- E. Two delusions seen at the same time

75. Which of the following pair is correctly matched?

- A. Obsessions – ego dystonic
- B. Delusions – ego dystonic
- C. Over valued ideas – ego dystonic
- D. Confabulation – ego dystonic
- E. All of the above

- 76. A patient suffering from schizophrenia makes up a totally new word that is not in a dictionary – ‘tynmis’ for sausage. Which of the following phenomena is he exhibiting?**
- A. Metonymy
 - B. Neologism
 - C. Verbigeration
 - D. Paraphasia
 - E. Stock word
- 77. Which of the following describes the most common type of hypnagogic hallucinations?**
- A. Being called by name
 - B. Seeing dead persons
 - C. Seeing monsters
 - D. Derogatory comments
 - E. Musical sound
- 78. Which of the following is a neurological illness that mimics schizophrenic speech disturbance?**
- A. Broca's aphasia
 - B. Alexia with agraphia
 - C. Wernicke's aphasia
 - D. Transcortical aphasia
 - E. Astereognosia
- 79. Which of the following is not a type of paranoid delusion?**
- A. 'Someone is following me.'
 - B. 'People in the street are talking about me.'
 - C. 'Aliens are making my body rot.'
 - D. 'The Messiah is watching my every move.'
 - E. 'Martians have landed on earth.'
- 80. A patient with dementia is asked to perform a cognitive task beyond his current ability. He becomes very agitated. This is called**
- A. Catastrophic reaction
 - B. Temper tantrum
 - C. Confabulation
 - D. Denial
 - E. Magnification
- 81. A 23-year-old man points to his left elbow and says he could hear voices coming from it. Which of the following symptoms is he exhibiting?**
- A. Anosognosia
 - B. Somatic hallucination
 - C. Extracampine hallucination
 - D. Auditory hallucination
 - E. Somatization

- 82. Which of the following symptoms denotes an abnormal psychopathology whenever present?**
- A. Obsessions
 - B. Delusions
 - C. Hallucinations
 - D. Depersonalization
 - E. Amnesia
- 83. When a patient is asked where she is living, she says 'Helltown' instead of 'Hilton'. She quickly corrects her error after saying the word. This is an example of which of the following phenomena?**
- A. Parapraxis
 - B. Confabulation
 - C. Pseudologia fantastica
 - D. Manipulation
 - E. Impulsivity
- 84. Pronominal reversal is a symptom associated with which of the following disorders?**
- A. Schizophrenia
 - B. Conduction aphasia
 - C. Pseudobulbar dysarthria
 - D. Autism
 - E. Mania
- 85. Which of the following refers to the sign present in autistic children who continually rotate in the direction in which their head is turned?**
- A. Vertigo
 - B. Automatic obedience
 - C. Catalepsy
 - D. Twirling
 - E. Twisting

1. B. Psychopathology is the systematic study of abnormal experience, cognition, and behaviour. It consists of two major divisions –

1. explanatory psychopathology, which attempts to explain causative factors through theory generation or experimental construction; hence explanatory psychopathology includes experimental (e.g. behaviourism) and theoretical (e.g. psychoanalysis) subtypes;
2. descriptive psychopathology, which precisely describes and categorizes abnormal experiences as reported by the patient and observed from his behaviour.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 2.

2. B. This patient is exhibiting a catatonic symptom called negativism. Patients with negativism resist or oppose all passive movements attempted by the examiner. A mild form of such resistance is called Gegenhalten or opposition. In extreme forms it is called negativism, where apparently motiveless resistance to all interference is found. Negativism can be a frustrating symptom, especially for carers involved in offering nursing assistance to the patient. The catatonic symptom of blocking or obstruction (or Sperrung) refers to a phenomenon similar to thought blocking but occurs while carrying out motor acts. A patient with obstruction suddenly stops a motor act for no reason, without any warning. This may be demonstrated by asking the patient to move a part of his body; the movement is generally well begun, but then stops halfway without any indication. In ambivalence the patient makes a series of tentative, opposing, alternate movements that do not reach the intended goal. This becomes evident when the patient is asked to carry out a motor act, for example asking the patient to show his tongue will elicit repeated protraction and retraction of tongue as if the patient is undecided about showing his tongue.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 365.

3.A. While humour may facilitate the process of clinical interview on certain occasions, it is not a necessary component of descriptive psychopathology. There are two essential components of descriptive psychopathology: (1) the observation of behaviour; and (2) the empathic assessment of subjective experience. The latter was referred to by Jaspers as phenomenology and implies that the patient is able to introspect and describe his internal experiences and the doctor recognizes and understands the description. To describe a phenomenon, it is important to appreciate the phenomenon from the beholder's point of view. This attempt to 'feel like how your patient might feel' is very different from feeling sorry or pity for your patient. The former is called empathy while the latter is called sympathy. Empathy is an essential component to learn further about the pathological processes taking place in a patient.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, pp. 5, 10.

4. D. The patient usually presents with loss or impairment of functions, the reasons for which will reveal the contents of the patient's thoughts and feelings. Form is the technical term (e.g. phobia, obsession, or delusion) used to identify a recurring pattern of experience or behaviour and so helps in diagnosing the psychiatric disorder. Content is essential for decisions about the management of the patient and family (suicidal content, admission, etc.), and is an important aspect of the severity of the disorder. A symptom described using descriptive psychopathology has both form and content as equally important components. The same content can occur in different forms, for example the content 'I'm too fat' can occur as an obsession, delusion, overvalued idea, or even hallucination.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 16.

5. E. Stimulus may be perceived as corresponding object but not as accurate as the real object. This is a perceptual error (sensory distortion), and can be associated with changes in physical properties, for example size, shape, intensity, and colour. In depression and hypoactive delirium there is dulled perception. Intense perceptions can occur in mania, hyperactive delirium, and drug-induced states (hallucinogens). Hyperacusis is especially seen in migraine and alcohol hangover.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 94.

6.A. A perceptual error associated with changes in shape of objects, especially with loss of symmetry, is called dysmegalopsia. The objects can shrink in size (micropsia) or enlarge (macropsia). These are usually organic and could be related to ictal (parietal) or ocular pathology (accommodation errors – paralysed accommodation can cause micropsia). They are also rarely seen in acute schizophrenia. Hallucinogens (e.g. mescaline) can also change the colour of perceived objects or make components of an object (e.g. body parts) be seen detached in space.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 94.

7. B. Imagery is not a perception because there is no stimulus involved and no object perceived; it is essentially a fantasy. Imagery refers to images produced voluntarily with complete insight that they are a mental phenomena and not of external origin. Imaginaries lack the 'objective' quality of hallucinations and normal sense perceptions.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 92.

8. D. There are three major types of illusions: in affect illusion the prevailing emotional state leads to misperceptions, for example a depressed patient reading 'deed' as 'dead', a boy frightened of the dark seeing monsters from innocuous shadows. Pareidolia refers to perceiving formed objects from ambiguous stimuli, for example seeing cars in the clouds. It is common in delirium, especially in children. They are often playful – not characteristic of any psychotic illness. Completion illusion is due to inattention; stimulus that does not form a complete object might be perceived to be complete, for example CCOK is read as COOK. Eidetic imagery is considered to be a special ability of memory wherein visual images are drawn from memory accurately, at will and described as if being perceived currently. This is not a perceptual distortion but closely linked to mental imagery and it is often noted in children.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 97.

9.A. Pareidolia refers to perceiving formed objects from ambiguous stimuli, for example seeing faces in a fire or hidden messages when records are played in reverse. It is coloured by prevailing emotion and not entirely due to inattention or affective change; fantasy and imagery play a part in addition to actual sense perception. On paying extra effort the object intensifies and does not disappear. Pareidolia is common in febrile delirium, especially in children, and also in hallucinogen use. They are under voluntary control and often playful. Occurrence of pareidolia is not characteristic of any psychotic illness.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 97.

10.D. Hallucinations have several important qualities which are essential in differentiating them from other mental phenomena. Hallucinations take place at the same time and in the same space as other perceptions, for example 'an angel is standing in the corner of my room'. This is different from fantasy or imagery which takes place in a subjective space. They are experienced as sensations – not as thoughts – in contrast to obsessional images. The percept has all the qualities of a real world object, that is a patient when hallucinating believes that the percept can be experienced in other modalities too, like a real object which can be seen, felt, smelt, and heard. Pseudohallucinations are defined variously. The term is used to describe hallucination-like experiences with retained insight (so it is not sought in other modalities of perception). It is also used to describe hallucination-like experiences that take place in a subjective space, for example 'a voice inside my head'.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 99.

11.A. Elementary hallucinations are unstructured hallucinations that are seen in acute organic states. They are composed of sounds or flashes without being fully formed. Elementary hallucinations can precede development of fully formed hallucinations, especially in alcoholic hallucinosis. The flashes of lights are also called phosphenes. Words such as 'go' are meaningful and so cannot be a part of elementary hallucination.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 100.

12.D. Phonemes are any auditory hallucinations that occur as human voices. Schizophrenic phonemes are usually multiple voices. The voices may or may not be recognizable. These voices are usually male with a different accent but speaking in one's mother tongue. Schizophrenic hallucinations are usually episodic – almost never continuous. Continuous, non-stop hallucinations should make one suspect the veracity of the reported experience.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 100.

13.E. Occipital lobe tumours, postconcussion states, epileptic twilight state, hepatic failure (any toxic delirium), and dementia are some of the known causes of visual hallucinations. In fact, nearly 30% of old-age psychiatric referrals have visual hallucinations. Solvent sniffing and hallucinogens can cause elementary visual hallucinations such as light flashes. In dementia of Lewy body type visual hallucinations are a prominent feature.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 103.

14.A. Elderly patients having normal consciousness and no brain pathology but with reduced visual acuity due to ocular problems experience vivid, distinct, usually well-coloured hallucinations. This is known by the eponym Charles Bonnet syndrome. Paradoxically these perceptions are clear and colourful in contrast to real sensation, which is blurred due to eye disease. These hallucinations are mostly in the form of humans, or at times animals and cartoons. These objects usually show movement, and can be voluntarily controlled to an extent as they disappear on closing the eyes. Insight about unreality is usually preserved – though they may evoke emotions, including fear and joy. About one-third of Charles Bonnet hallucinations are elementary, unformed hallucinations. Usually these hallucinations are located in external space.
Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 104.

15.C. Lilliputian hallucinations can occur in visual or haptic mode – they usually involve seeing tiny people or animals (or feeling diminutive insects crawling if haptic) and are seen in delirium tremens. Unlike other organic visual hallucinations, lilliputian hallucinations can be accompanied by pleasure (though this is often intermingled with terror). These are not the same as micropsia. Micropsia is a perceptual distortion but not a hallucination as there is a stimulus which is perceived to be erroneously small. Perception of small objects in the absence of such stimuli is a lilliputian hallucination.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 105.

16.B. Palinopsia (*palin* for ‘again’ and *opsia* for ‘seeing’). is a visual disturbance that causes images to persist even after their corresponding stimulus has ceased. It is seen in LSD use, migraine, occipital epilepsy, and head trauma. It is similar to afterimage but colour inversion (usually shadows or distorted colours) noted in afterimages is conspicuously absent. Formication (formic acid – from ants) is a special type of haptic hallucination. It is often an unpleasant sensation of little animals or insects crawling under the skin, seen in delirium tremens and cocaine intoxication.
Smith, P et al. *Palinopsia*. *The Lancet*, 361, 1098–1098

17.C. Autoscopic hallucinations are the visual experience of seeing oneself. It is seen predominantly in males compared to females at a ratio of 2:1. Impaired consciousness is a common accompaniment and depression is the commonest psychiatric cause of autoscopy. They are also called phantom mirror images and may take the form of pseudohallucinations. Schizophrenia (where autoscopic experience is usually pseudohallucinatory), TLE, and parietal lesions (organic states more likely to have true hallucinations) are also implicated. In negative autoscopy one looks into a mirror and sees no image at all.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 105.

18.D. Chronic benzodiazepine use leads to the development of dependence, with a characteristic withdrawal syndrome that presents with anxiety and agitation, insomnia, tremor, depersonalization, and, if severe, can lead to seizures and delirium. Kinaesthetic or proprioceptive hallucinations refer to joint or muscle sense, often linked to bizarre somatic delusions. Kinaesthetic hallucinations are seen in benzodiazepine withdrawal and alcohol intoxication.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 106.

19.C. The common experience of phantom limb is a body image disturbance and not a hallucination; though it is in external space, it does not satisfy other qualities of hallucination and patients are usually aware of unreality. It is a body image disturbance with a neurological basis.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 266.

20.A. Extracampine hallucinations are hallucinations that occur outside the normal field of perception, for example images seen behind your back, under your sternum, or hearing voices from Inverness, etc. (if you are not living in Inverness, of course!). They occur in schizophrenia, epilepsy, and also in hypnagogic hallucinations of healthy people – so they are not diagnostically important.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 112.

21.C. In functional hallucinations an external stimulus provokes a hallucination, and both hallucination and stimulus are in same modality but individually perceived, for example voices heard simultaneously when ever the noise of water running through a kitchen tap is heard. They are not illusions, as the stimulus is perceived appropriately (noise of water), but in addition there is another perception (voices) without an appropriate object. If hallucinations in one modality are provoked reflexively by stimulus in another modality, for example seeing an angel when ever listening to music, then this is called reflex hallucination. The phenomenon of perceiving a stimulus of one modality in a different modality (may be single or multiple modalities) is called synaesthesia, for example tasting the music, hearing colours, and smelling voices.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 112

22.B. Synaesthesia is defined broadly as a mingling of the senses. People with the condition may see a colour when they look at a number or hear a tone when they see a colour. It is not a hallucination as the perception comes from an appropriate stimulus. The original stimulus is simultaneously perceived in appropriate modality in addition to the cross modality perception (*syn* – joint, simultaneous).

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 113

Ramachandran VS and Hubbard EM. Synaesthesia: A window into perception, thought and language. *Journal of Consciousness Studies* 2001; **8**: 3–34.

23.E. Synaesthesia is common in females (4:1), runs in families, and colour–number synaesthesia is the most common form. It is thought to be due to extensive cross-wiring between multimodal association regions in some people, probably due to failed selective pruning. It is not a hallucination.

Baron-Cohen S, Burt L, Smith-Laittan F, et al. Synaesthesia: prevalence and familiality. *Perception* 1996; **25**: 1073–1079.

24.D. The pathology of thought can be divided into content (What is being ‘thought about?’), form (In what manner (or shape) is the thought present?), and stream or flow (How is it being thought about?). Disordered thought content is seen as delusions, for example persecutory themes, obsessions, or preoccupations. Overvalued idea is also a disorder of thought content. Disordered stream of thought is seen as poverty of thought, pressure of speech, and crowding of thoughts. Disordered form of thought, as seen in schizophrenia and other psychotic disorders, refers to a set of various alterations in the thinking process – loosening of associations, metonyms, tangentiality, and circumstantiality to name a few. As an analogy, ‘thought’ can be considered to be a box of packed fruits bought in the supermarket. Form is equivalent to the shape of the box (e.g. rectangular plastic box), content is equivalent to the type of fruit (e.g. oranges or peaches) and stream is equivalent to the number of fruits in the box (e.g. 6 or 12).

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 149.

25.A. Of all thought disorders classified by Andreasen, clanging and flight are more common in mania while derailment (loosening) and thought blocking (and to some extent tangentiality and poverty of content of speech) are seen often in schizophrenia – other items were not thought to be specific for a particular psychiatric condition.

Andreasen, N. C. (1979) Thought, language, and communication disorders: I. Clinical assessment, definition of terms, and evaluation of their reliability. *Archives of General Psychiatry*, 36, 1315–1321

26.B. In perseveration the thought process tends to persist beyond a point at which they are relevant. Perseveration generally occurs with clouded consciousness and is considered pathognomonic of organic brain disease. Perseveration can be demonstrated verbally or through repetitive motor activity. It can be seen in schizophrenia too. Stuttering is due to motor speech in-coordination and does not involve the mechanism of perseveration.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, pp. 69, 157.

27.E. Obsessions usually evoke distress and anxiety and are not pleasurable by definition. They are unwanted, intrusive, repetitive, senseless thoughts experienced by patients as troublesome and resisted. Obsessions can be thoughts, words, impulses, or images. They usually occur in themes of sex, religion, violence, safety, and grooming (e.g. orderliness, washing out germs, etc.).

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 336.

28.A. In obsessions, though the appearance of the thoughts themselves is appreciated to be beyond a patient's control, they are not claimed to be due to an external agency. Obsessions are regarded to be one's own mind's product but ego-dystonic – against one's values and needs. Often during the course of OCD, primary obsessions fade while compulsions dominate the clinical picture; some compulsions can be mental behaviours such as praying, counting, etc.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 338.

29.D. A subjective disturbance in thinking seen in schizophrenia is described as passivity, which can occur in the form of thought insertion, thought withdrawal, and thought broadcasting. These are first-rank symptoms of schizophrenia. Thought blocking is not a passivity or alienation phenomenon.

Simon M and Spence SA. Re-examining thought insertion: Semi-structured literature review and conceptual analysis. *British Journal of Psychiatry* 2003; **182**: 293–298.

30. B. The first-rank symptoms are:

Three hallucinations:

Audible thoughts (thought echo)

Voices heard arguing (3rd person)

Voices heard commenting on one's actions (running commentary)

Three 'made' phenomena:

Made affect (someone controlling the mood/ affect)

Made volition (someone controlling the action – usually a completed act)

Made impulse (someone controlling the desire to act – not completed act but the drive. If the action has been carried out, then the patient admits to ownership of the act, not the impulse behind it)

Three thought phenomena: (experiences themselves are more important than later explanations of how a patient interprets them)

Thought withdrawal

Thought insertion (external agency inserting thoughts into the patient)

Thought broadcast (also called thought diffusion – as if in a television broadcast, everyone comes to know about the patient's thinking as and when the patient thinks – refers to loss of privacy of thoughts. Contrast with referential delusion – 'people act as if they know what I am thinking')

Two isolated symptoms:

Delusional perception

Experience of sensations on the body caused by external agency (somatic passivity)

Somatic hallucinations are NOT first rank symptoms unless there is a delusional elaboration and attribution of the origin of sensations to an external agency (passivity).

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 165.

31.A. Kurt Schneider proposed an empirical cluster of symptoms, one or more of which, in the absence of evidence of organic processes, can be used as positive evidence for schizophrenia. These symptoms are not comprehensive features of schizophrenia; they are clearly identifiable, frequently occurring, and occur more often in schizophrenia than any other disorder. First-rank symptoms emphasize form rather than content, for example the fact that one's thoughts are heard as echo of voices is more important than the actual content of the voices; this increases cross-cultural reliability, although variations exist. First-rank symptoms have some diagnostic but no prognostic importance in schizophrenia.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 166.

32. B. Somatic passivity refers to experience of sensations in one's body believed to be caused by some external agency. It can follow a normal sensation, such an osteoarthritic knee pain, ascribed to be caused by an external agency, as in this case.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 169.

33. E. Kendler (1983) has listed the dimensions of delusional experiences (also incorporated in the Maudsley Assessment of Delusions Scale) – conviction, extension (to various spheres of life), disorganization (or organization–internal consistency and systematization), bizarreness (especially in schizophrenia), and pressure (includes preoccupation and distress). Acting on delusion, seeking evidence, and lack of insight can be added as other qualities. These various dimensions exist in a continuum with normal beliefs.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 119.

Kendler KS, Glazer W, Morgenstern H. Dimensions of delusional experience. *American Journal of Psychiatry* 1983; **140**: 466–469.

34. E. Primary delusions are defined in two different ways: (1) Jaspers' concept of primary delusions is that they are un-understandable and cannot be reduced further to any other mental experiences; and (2) primary delusions are also thought of as the first abnormal mental experience to occur in schizophrenia prodrome (primary as per temporal sequence). Often both of these are true – primary delusions are not only irreducible but also precede other mental phenomena. The four types of primary delusions are: (1) delusional mood; (2) delusional perception; (3) delusional memory; and (4) autochthonous delusion (often simply referred to as a primary delusion).

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 120.

35. B. Morbid jealousy can occur in various forms – delusion, overvalued idea, in depression, and in anxiety states; it is not a misidentification syndrome. It was first described by Ey. It is common in alcoholics. It has a potential for violence, especially against the perceived rival for one's partner, and can occur among cohabitants and homosexual couples too.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 132.

36. E. Cotard's syndrome is severe depression with nihilistic and hypochondriacal delusions tinged with grandiosity and a negative attitude. It is not related to delusional misidentification. Cotard's syndrome is seen in schizophrenia, though more commonly in depressive psychosis. It is generally seen in elderly people and is also reported in organic lesions and migraine.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 13.

37. A. Couvade syndrome describes a sympathetic pregnancy that affects husbands (rarely other family members) during their wives' pregnancies. It is most frequent between 3 and 9 months of a spouse's pregnancy. It is a conversion symptom and not delusional as the husband does not believe he is pregnant! Pseudocyesis is a condition where a woman experiences clinical signs of pregnancy without being pregnant, and she may become fully convinced of being pregnant.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 288.

38. E. Delusional infestation (Ekbom's syndrome) is a delusion of parasitic (macroscopic) infestation with classical matchbox sign. An old lady comes to clinic with a match box of skin scrapings, as evidence for the parasite that infests her, causing itching. This can predate the onset of dementia. It may or may not be associated with a somatic tactile hallucination. It is not the same as compulsive skin picking, where the psychopathology is one of compulsion and not delusion. In factitious dermatitis, patients seek medical attention without obvious monetary gain in order to be in a patient role. They induce skin lesions using chemicals or medicinal products in order to 'become a patient'. This lady is not having somatization where multiple, non-specific somatic (mostly pain) symptoms are present.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 139.

39. B. The various misidentification syndromes are: (1) Capgras syndrome, where a patient believes that a person, usually close to him, has been replaced by an exact double; (2) Fregoli syndrome, where there is false identification of strangers as familiar persons; a familiar person is thought to be taking various disguises; (3) syndrome of subjective doubles, where the patient believes that another person has been physically transformed into his own self and the patient is convinced that exact doubles of him- or herself exist; and (4) intermetamorphosis – Person A becomes C, C becomes B, etc.; people keep transforming their physical and psychological identities.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 134.

40. D. Doppelganger is also known as double phenomenon – it is the awareness of one's existence as being both outside and inside oneself. It is cognitive and ideational, as opposed to autoscopv which is perceptual. It can occur in the absence of mental illness too. It is not related to delusional misidentification syndromes where there is pathology of familiarity.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 217.

41. A. Ideas of reference are seen in paranoid personality disorder where the individual is unduly self-conscious and feels that people take notice of him or observe things about him that he would rather not be seen. It can also precede development of full-blown schizophrenia, where it is called sensitive ideas of reference or 'sensitiver Beziehungswahn'.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 144.

42. E. Overvalued ideas (Wernicke) are solitary, abnormal beliefs that are neither delusional nor obsessional in nature, but dominate a person's actions. They have a poor prognosis and tend to dominate the sufferer's life. Common conditions presenting with overvalued ideas are paranoid or anankastic personality disorder, Body dysmorphophobia, anorexia nervosa, morbid jealousy, and trans-sexualism.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 143; see Table 8.1, p. 144.

43. E. Normal thinking is of three types (or functions): (1) Fantasy/ dereistic thinking or autistic thinking: There is no goal direction in the thoughts. The contents are often unrealistic, for example day dreaming. It is seen predominantly in cluster A personality, dissociation, and pseudologia fantastica. (2) Imaginative thinking: This includes fantasy elements but admixed with true memory and abstract concepts. Imaginative thinking is often goal directed and does not cross boundaries of possibility and realism. Determining tendency of thoughts are preserved, for example lateral thinking. (3) Rational or conceptual thinking: This is often based on material reality and uses logic. Desultory thinking is a type of formal thought disturbance proposed by Carl Schneider.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 150.

44. A. Asyndesis is defined as lack of genuine causal links in speech. It is a type of formal thought disorder observed by Cameron. Poverty of content of speech or alogia is a term used to describe lack of information in speech. Lack of wide vocabulary could be measured by poor type–token ratio. Low type–token ratio has been observed in schizophrenia.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 160.

45. A. In clang associations, thoughts are associated by the sound of words rather than their meaning, that is through rhymes (rail/ tail/ sail) or puns (one word with two meanings rose = flower/ past tense of rise). Clang associations can form the basis for flight of ideas. Pressured speech is not a formal thought disturbance; it is rather a disturbance in stream of thought.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 183.

46. E. Neologism refers to making up a totally new word that is not in dictionary or using a known word with a completely different meaning, for example 'inkur' for pen (here a new word is created) or 'roast' for pen (here a known word is employed different to normal usage). Metonyms are word approximations, for example paperskate for pen. Stock words are either newly synthesized or already known words but used in an idiosyncratic way repeatedly, often with many meanings and in different contexts, sometimes dominating a discourse, as in this example. The word 'whirl' here stands for 'meaning', 'to live', 'to sleep', 'nature' etc. Neologisms, stock words, and metonyms together constitute private symbolism noted in schizophrenia.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, pp. 175, 181.

47.A. In overinclusive thinking ideas that are only remotely related to the concept under consideration become incorporated in the patient's thinking. Normal conceptual boundaries are lost in overinclusive thinking. This is used to explain the thought disorders in schizophrenia and is different from the mechanism in flight of ideas. Sorting tests can be used to test overinclusion. It occurs in nearly 50% of schizophrenia patients, especially when they are acutely ill.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 160.

48.A. Vorbeireden ('talking past the point') is often used interchangeably with vorbeigehen ('going past the point'). Vorbeigehen was originally defined as part of the 'Ganser syndrome' whereby some criminals would give incorrect answers ('approximate answers') to simple questions. The incorrect answers themselves suggest that the question was well comprehended and the correct answer was known (e.g. Question: How many legs do dogs have? Answer: Five). Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 173.

49.A. In circumstantiality, thinking proceeds slowly, with many unnecessary details and digressions, before returning to the point. It is seen in some patients with temporal lobe epilepsy or alcohol-induced persisting dementia, learning difficulty, and in obsessional personalities. It is a formal thought disorder where figure ground differentiation apparently fails. It is not due to affective changes such as mania. It is not the same as tangentiality – the patient never reaches the point in tangentiality, whereas they do reach the point in circumstantiality. Imagine a spiral that eventually touches its centre, while tangent scrapes through the edge and never reaches the centre. Circumstantiality may be related to loosened associations and usually develops within the setting of a delusional mood in schizophrenia; it may be due to an impairment of a central filtering process that normally inhibits external sensations and internal thoughts that are irrelevant to a given focus of attention.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 154.

50.D. In pure word deafness the patient can speak, read, and write fluently, but comprehension of speech is impaired. In pure word dumbness the disturbance is limited to an inability to produce and repeat words at will. In pure word blindness (alexia) speech and writing are normal but the patient cannot read. Comprehension of spoken words is preserved in pure word blindness.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 176.

51.D. Concrete thinking is seen as thinking characterized by a predominance of actual objects and events and the absence of concepts and generalizations, that is failed abstraction. It is recognizable clinically but difficult to measure using psychometric tests. According to Goldstein concrete thinking is a direct result of loss of abstract thinking. It is observed that concrete thinking is evident in speech-disordered (FTD) schizophrenia patients, but not in the non-FTD group (Allen 1984). It is also seen in frontotemporal dementia.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 181.

Allen HA. Positive and negative symptoms and the thematic organization of schizophrenic speech. *British Journal of Psychiatry* 1984; **144**: 611–617.

52.C. Schizophrenic thought disorder could be measured using repertory grids (Bannister) based on Kelly's personal construct theory. The patient is asked to score different elements (can be relatives or friends) under different constructs (qualities of them). Normally, one would expect congruence between different constructs scored for an element, for example Mum is helpful and she is also kind and supportive. But in schizophrenia the predictability of an element's quality using prior constructs is affected. (Mum is helpful but scores low on kindness and support offered). This is called serial invalidation and is more pronounced for peoples than objects, showing that thought disorder affects interpersonal realm more than other spheres. The scores can be used to draw a semantic space, demonstrating graphical connections between people and qualities in a patient's personal world.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 161; see Fig. 9.8.

53.E. All of these stated methods have been employed to quantify formal thought disorder seen in schizophrenia. Word association tests are abnormal in schizophrenia. Patients with schizophrenia prefer dominant meaning of a word, despite the context of its usage, for example court means 'law-room' not tennis court, in spite of a discussion about sports. This abnormality can be tested using word association tests. In cloze procedure parts of one's recorded speech are deleted to see if meaning could be still predicted; predictability was reduced in the speech of patients with schizophrenia. Type–token ratio refers to the ratio between the number of different words used during a discourse and the total number of spoken words. Impoverished vocabulary was noted with low type–token ratio among schizophrenia patients. Cohesion analysis refers to the analysis of links between sentences and words in a discourse. It shows that schizophrenia patients use less referential ties (e.g. using pronouns without mentioning a subject in first place) and more lexical ties (i.e. connected words).

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 185.

54.A. Déjà vu is the feeling of having seen or experienced an event, which in fact is being experienced for the first time. Jamais vu is loss of familiarity of an event or situation that has been experienced before. Both can occur in normal people, and in temporal lobe epilepsy. Déjà vu and jamais vu are considered as pathologies of familiarity.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 84.

55.B. Ganser's syndrome includes:

Approximate answers

Clouding of consciousness with disorientation

Psychogenic physical symptoms – analgesia and hyperaesthesia

Pseudohallucinations (not always present)

Patients with Ganser's syndrome may be amnesic for their abnormal behaviour.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 252.

56.C. Insight is a multidimensional concept; it is not useful to restrict oneself to the assessment of 'presence' or 'absence' of insight. Though traditionally insight was considered to be present in those with neurosis and absent in those with psychosis, this is now regarded as too simplistic. Insight is now recognized to exist in a spectrum of varying degrees. David (1990) has considered insight to be composed of an awareness of one's own mental experiences, ability to recognize abnormal experiences as pathological, and compliance with treatment interventions. Insight is closely related to the neurological symptom of anosognosia. A patient who is suffering from a hemiplegia refuses to accept that he has lost the function of his limb. ('A'—absence, 'noso'—ill health or disease, 'gnosis'—awareness).

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 206.

David AS. Insight and psychosis. *British Journal of Psychiatry* 1990; **156**: 798–808.

57. C. Depersonalization is the third most common symptom that is seen in patients attending psychiatric clinics. It is defined as a change in self awareness where the individual feels as if he is unreal. The 'as if' quality differentiates it from psychotic states. When a similar feeling occurs for objects and environment around an individual, it is termed as derealization (Mapother). It is always subjective, unpleasant, and invariably associated with affective change but preserved insight. Emotional numbing, loss of feelings of agency and self esteem, disturbed body image, altered perception of time, and disturbed sensory experiences of all modalities are reported.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 231.

58. D. The patient described here most probably suffers from depression with difficulty in expressing here feelings to others. Inability to verbally express emotional states (alexithymia) can partially explain symptoms of somatization occurring secondary to depression. In somatization disorder, recurrent, multiple, frequently changing somatic complaints are present for several years; this is not the case with the patient described in this question. Pathological changes in right cerebral hemisphere projections and failed thalamic feedback are also suggested but not proved as possible explanations for somatizing. It is suggested that the patients with first-rank symptoms of psychosis have difficulties in differentiating the 'source' of their experiences. They might misattribute internal mood state or self generated motor impulses to external sources, leading to a delusional elaboration.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 246.

59. C. Pathological gambling is defined as persistent, recurrent and problematic gambling behaviour associated with a preoccupation to gamble and spending increasing amounts of money in gambling. Patients often show a loss of control over gambling and pursue gambling at considerable expense of other activities of daily living. It is best regarded as an impulse control disorder together with kleptomania, intermittent explosive disorder and pyromania, etc. The gambling behaviour must not be directly due to manic episodes in order to be diagnosed as pathological gambling. It is not an overvalued idea; it is an abnormal behaviour and not merely an aberration of thought content. Pathological gambling is not an essential feature of antisocial personality.

DeCaria CM, et al. Diagnosis, neurobiology, and treatment of pathological gambling. *Journal of Clinical Psychiatry* 1996; **57** (Suppl. 8): 80–83.

60. E. Alexithymia is often accompanied by diminution of fantasy, reduced symbolic thinking, literal thinking concerned with details, difficulties in recognizing one's own feelings, difficulties in differentiating body sensations and emotional states, and complaints of robot-like existence. Amnesia is not a feature of alexithymia.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 309.

61. C. Out of body experiences, autoscopy, depersonalization, and transcendental experiences together in various proportions constitute a near death experience. The temporal-parietal junction may be the seat of pathological change in near death experience. The experience of seeing oneself from an external space is a feature of autoscopy. The detached, 'as if' quality of near death is linked to depersonalization.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 225.

62. B. In catatonic mutism comprehension is preserved and the patient may obey commands. It can range from full mutism to partial states where the patient mumbles and makes non-verbal vocalizations. Patients can move their vocalizing muscles – hence they can cough and clear their throats. Other catatonic signs are ambivalence (patient appears stuck in indecisive, hesitant movements), automatic obedience (exaggerated cooperation with examiner's request or incessant continuation of requested movement), and echopraxia/ echolalia (mimicking examiner's movements/ speech) etc.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 364.

63. D. Astasia-abasia refers to the inability to either stand or balance oneself. Patients exhibit a dramatic gait disturbance, inconsistent with focal neurological deficits. They can walk more or less normally though they cannot stand balanced. It is a dissociative conversion reaction similar to other pseudoneurological problems seen in conversion.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 252.

64. E. Hallucinations are not always pathological. Any normal person can experience hallucinations, for example hypnagogic hallucinations and hallucinations during bereavement. Even patients with very low IQ can experience these perceptual disturbances, as perception requires a lower-level cognitive processing. Even congenitally deaf patients can experience hallucinations, emphasizing the role of higher brain centres not lower sensory organs in producing the phenomenon.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 108.

65. E. An exaggeration of self-serving attribution bias is seen in psychosis. Patients excessively attribute hypothetical, positive events to internal causes (stable and global – grandiose) and hypothetical, negative events to external causes (stable and global – persecutory). When deluded patients were shown a sequence of black and white beads and were asked to decide which jar the sequence was probably drawn from (jar A had majority of black beads and B had majority of white), they came to a conclusion with far fewer beads in a given sequence than controls. They were also relatively overconfident about the accuracy of their judgement. This is hypothesized to be due to impaired probabilistic reasoning (the ability to generate hypothesis and test statistical probability). But later studies showed that when allowed to see as many beads as the controls, patients reached similar, correct conclusions – they were able to generate hypothesis and test the probability; the defect being deficient data gathering (less information before decision). This is called jumping-to-conclusion style of reasoning (JTC). Persecutory delusions reflect false beliefs about the intentions and behaviour of others that could arise from theory of mind deficits.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 130.

Also see

Blackwood NJ et al. Cognitive neuropsychiatric models of persecutory delusions. *American Journal of Psychiatry* 2001; **158**: 527–539.

66.A. Primary delusions do not carry any prognostic significance in schizophrenia, though they have diagnostic relevance. Primary delusions can occur in epileptic psychoses too. Primary delusional experiences occur more in acute stages of schizophrenia, and are rarely seen in chronic schizophrenia. In the chronic phase, original primary delusions are replaced largely by secondary delusions. The term secondary delusions refers to delusions that follow a primary delusion or follow other mental phenomena such as hallucinations, affective disturbances, etc.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 129.

67. C. Reduplicative paramnesia is the delusional belief that a place or location has been duplicated, existing in two or more places simultaneously, or that it has been 'relocated' to another site. It is one of the delusional misidentification syndromes and, although rare, is most commonly associated with acquired brain injury, particularly simultaneous damage to the right cerebral hemisphere and to both frontal lobes. It is also noted in patients with delirium.

David AS and Halligan PW. Cognitive neuropsychiatry: potential for progress. *Journal of Neuropsychiatry and Clinical Neuroscience* 2000; **12**: 506–510.

68. D. Among inpatients with schizophrenia, 25% have age disorientation. Age-disoriented patients are younger at first admission and have had a longer duration of stay than patients with a diagnosis of schizophrenia without age disorientation. Age disorientation may be a feature of a type of schizophrenic illness of early onset and poor prognosis.

Stevens M et al. Age disorientation in schizophrenia: a constant prevalence of 25 per cent in a chronic mental hospital population? *British Journal of Psychiatry* 1978; **133**: 130–136.

69. C. Bleuler argued that a cardinal feature of schizophrenic deterioration involved 'double registration' or 'double orientation'. According to him, in schizophrenic patients a delusional world exists where misinterpretations and threatening events are common. This is in addition to the existence of a 'real' world wherein life is near normal. These two orientations often get clearly separated in a long-standing, chronic schizophrenia patient.

Bleuler E. *Dementia Praecox or the Group of Schizophrenias*. New York: International Universities Press, 1950.

70. C. Akathisia is a subjective feeling of restlessness, with or without objective signs of restlessness. It can present with a sense of anxiety, inability to relax, jitteriness, pacing, rocking motions while sitting, and rapid alternation of sitting and standing. It can be measured using Barnes akathisia scale.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 368.

71. D. A gait disturbance seen in conversion disorder is called as astasia–abasia. It is a wildly ataxic, staggering gait accompanied by gross, irregular, jerky truncal movements, and thrashing and waving arm movements. Patients with the symptoms rarely experience a fall; even if they do, they do not get seriously injured. Posturing is maintaining an uncomfortable posture for a long time. Negativism is motiveless resistance to all movements; catatonia can also present itself as mitgehen – patient bends his limb even with a gentle finger push from the examiner like an 'angle poise lamp'. Ambitendence is tested by asking the patient to show his tongue – the patient will keep moving it in and out similar to a 'jack in the box'.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 365.

72. A. In neurological spasticity the tone is increased irrespective of passive or active movements. A patient with catatonia can use the affected limb or muscle group when needed with completely normal tone – for example running out when there is a fire. Negativistic phenomena, for example gegenhalten and mitgehen, are often distinguishing features of catatonia. Gegenhalten refers to the phenomenon where the patient resists movement of his or her extremities by the examiner. Mitgehen is said to be present when the patient moves in the direction of a slight push from the examiner in spite of the command to remain still. Catatonia persists in sleep and can continue for weeks without improvement. Catatonia is mostly seen in advanced primary mood or psychotic illnesses. Among inpatients with catatonic presentation, 25 to 50% are related to mood disorders and approximately 10% are associated with schizophrenia.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 365.

73.A. Some differences are reported in the quality of anhedonia experienced by patients who are depressed compared to patients with schizophrenia. In depression anhedonia is more physical – not able to enjoy listening to music, not able to enjoy going for walks, etc. In schizophrenia it is thought to be more social – that is not able to enjoy other's company, not feeling warm in personal relationships, etc. A longitudinal study by Blanchard et al. (2001) compared depressed patients and schizophrenia patients on a measure of social anhedonia; recovered depressed patients showed significantly less social anhedonia than schizophrenia patients on follow-up after 1 year. This suggests that anhedonia in depression is more of a state than a trait characteristic while it may be a trait characteristic in schizophrenia.

Joiner TE, et al. A test of the tripartite model's prediction of anhedonia's specificity to depression: Patients with major depression versus patients with schizophrenia. *Psychiatry Research* 2003; **119**: 243–250.

Blanchard JJ, Horan WP, Brown SA. Diagnostic differences in social anhedonia: a longitudinal study of schizophrenia and major depressive disorder. *Journal of Abnormal Psychology* 2001; **110**: 363–371.

74.C. Folie a deux is a shared delusion in which a psychotic person transfers his delusions to one or more people close to him. The non-psychotic 'victim' usually exhibits dependent traits on the primary patient. Separation of the pair can result in remission. The pair is usually a married couple or sisters/ brothers. Folie a deux can develop in any two persons with a close association with each other, irrespective of their actual relationship.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 140.

75.A. Obsessions by definition are ego dystonic – against ones values or ideals. Delusions often arrive as judgements or explanations, relieving a puzzled atmosphere that precedes them. In view of such 'relieving effect', delusions can be termed as ego syntonic. Overvalued ideas are adhered to and acted upon by the patient, making them ego syntonic.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, pp. 337, 125.

76.B. Neologism refers to making up a totally new word that is not in a dictionary or using a known word with a completely different meaning. Perseveration refers to repetition of the same response to different stimuli. Perseveration also includes persistent repetition of specific words or concepts in the process of speaking. Such repeated responses may be meaningful but inappropriate, for example providing the same answer to different questions. Perseveration is seen as a frontal dysfunction. Verbigeration refers to meaningless and stereotyped repetition of words or phrases, as seen in schizophrenia. Verbigeration is also called cataphasia.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 181.

77.A. Both illusions and hallucinations are not necessarily pathological though they both are false perceptions, along with pseudohallucinations. Hypnagogic hallucinations are hallucinations occurring when going to sleep ('go' for 'go') these are usually auditory hallucinations. One's name being called by a familiar voice is the most common hypnagogic hallucination. This is also seen in narcolepsy-cataplexy where it can be visual or tactile too. Hypnopompic hallucinations (hallucinations when waking up) can occur in normal individuals. They also occur in glue sniffing, postinfective depression, children with febrile illness, and in phobic anxiety.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, pp. 108, 112.

78. C. Wernicke's aphasia is also called jargon aphasia. Here the comprehension of a patient is limited but motor production is more or less preserved. This leads to error-prone language similar to the incoherence noted in schizophrenic speech disturbances. In Broca's aphasia the patient cannot produce fluent language although his comprehension is preserved. Alexia is inability to read words while agraphia is inability to write. Although schizophrenic speech disturbances can be deciphered from one's writing, this does not equate to having agraphia. Astereognosis refers to the inability to differentiate the character of an object by using a single perceptual modality, for example closing one's eyes and palpating a coin should be sufficient to discover the shape of the coin normally. This ability is absent in patients with astereognosis.

Covington MA et al. Schizophrenia and the structure of language: The linguist's view. *Schizophrenia Research* 2005; **77**: 85–98.

79. E. Paranoia is a loosely used term. Paranoia literally means 'beside the mind'. Paranoid delusions include any self-referential delusions such as referential delusions, persecutory delusions, grandiose delusions, hypochondriacal delusions, and nihilistic delusions. Some bizarre delusions are not self referential and are not classified as paranoid delusions, as in this question.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 144.

80. A. Catastrophic reaction is seen in demented patients who are asked to perform a task that is clearly beyond their cognitive capacity. They may become anxious, agitated, and angry. This is not a universal phenomenon. This occurs in some patients even if they do not have explicit awareness of their cognitive impairment.

Tiberti C et al. Prevalence and correlates of the catastrophic reaction in Alzheimer's disease. *Neurology* 1998; **50**: 546–548.

81. D. In this example, the best description for the patient's symptom of hearing voices is auditory hallucination. It cannot be somatic hallucination where touch sensations are involved. Abnormal bodily sensations called as 'cenesthesia' are well associated with psychopathological symptoms in schizophrenia. 'Cenestopathic schizophrenia' is included but undefined within the category 'other schizophrenia' (F20.8) in the ICD-10 classification. Anosognosia refers to lack of awareness of having neurological deficits akin to loss of insight in schizophrenia. It is not somatization as this example describes a psychotic symptom. It is not extracampine as the patient's sensory field contains the source of the voice, that is his elbow is within the reach of his eyesight and auditory field.

Jenkins G and Röhricht F. From cenesthesia to cenestopathic schizophrenia: a historical and phenomenological review. *Psychopathology* 2007; **40**: 5, 361.

82. B. Most psychopathological symptoms are noticeable in so-called normal population in the absence of diagnosable mental conditions. For example hypnagogic hallucinations are very common. Depersonalization can occur during fatigue in normal persons. Obsessions are noted in a child's developmental period even in the absence of any pathological processes. Amnesia is also common in the general population. But delusions are almost always pathological. It is argued that beliefs exist in a dimension from normalcy through overvalued ideas up to delusions. Even if this is true, when delusions are identified clinically, they almost always mean a pathological process.

Sims A. *Symptom in the Mind*, 3rd edn. London: Elsevier Science, 2003, p. 117–148.

83.A. A parapraxis is an unintentional act that is explained in psychoanalytic terms as perfectly motivated but unconsciously determined failures of ego defence. According to Freud, parapraxes include failures of memory, slips of the tongue, mistaken identity or activities, etc. Confabulation refers to filling memory gaps in patients with organic memory difficulties such as Korsakoff's syndrome or dementia. A confabulating patient makes no attempt to correct the validity of his statement. In pseudologia fantastica, seen in Munchausen's syndrome and histrionic personality, 'fantastic' fluent lies are told without full awareness of their implications.

Berman D. Deliberate parapraxes. *International Review of Psycho-analysis* 1988; **15**: 381–384.

84.D. In pronominal reversal a subject reverses the usage of the pronouns 'I' and 'you'. The patient may say 'You want a biscuit' when in fact she/ he wants a biscuit. This is seen in autistic children. This is more or less characteristic and not seen in other psychiatric illnesses as often as in autism. In conduction aphasia, repetition is affected while motor production of speech and comprehension are preserved. Pronominal reversal is not a part of schizophrenic speech disturbances or manic thought disorders.

Lee A. I, you, me, and autism: An experimental study. *Journal of Autism and Developmental Disorders* 1994; **24**: 155–176.

85.D. Twirling is often noted in children with autism. The repetitive behaviours often seen in autism include hand flapping, finger flicking, rocking, jumping, and head banging. Repetitive use of a particular object or a part of the object is often observed in people at the lower functioning end of the autistic spectrum and in children rather than adults with autism. This is not a catatonic phenomenon.

Bodfish JW, et al Varieties of repetitive behaviour in autism; comparison to mental retardation. *Journal of Autism and Developmental Disorders* 2000; **30**: 237–243.

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1. Which of the following theories was NOT proposed by Sigmund Freud?

- A. The topographical model of mind
- B. Affect trauma theory
- C. Individual psychology theory
- D. The structural model of the mind
- E. Psychosexual stages of development

2. Which of the following is true about primary process thinking?

- A. It fulfils the reality principle
- B. It fulfils the pleasure principle
- C. It is associated with delay in gratification
- D. It is ruled by rational thinking
- E. It is ruled by the concept of time

3. All of the following are functions of ego EXCEPT

- A. Accommodating the ego ideal
- B. Control and regulation of instinctual drives
- C. Rational judgement
- D. Mediation between the internal world and external reality
- E. Capacity to form mutually satisfying relationships

4. Carol is undergoing psychotherapy. During her therapy sessions, she begins to argue with her therapist as she had argued with her deceased father. Which of the following phenomenon is she demonstrating?

- A. Transference
- B. Resistance
- C. Free association
- D. Catharsis
- E. Repression

- 5. Which of the following refers to the mechanism by which several unconscious wishes can be combined into a single image in the manifest dream content?**
- A. Displacement
 - B. Symbolic representation
 - C. Secondary revision
 - D. Condensation
 - E. Dream work
- 6. According to Adler, a sense of inadequacy and weakness that is universal and inborn is called**
- A. Inferiority complex
 - B. Organ inferiority
 - C. Birth order theory
 - D. Masculine protest
 - E. Individual psychology
- 7. Which of the following is NOT a concept proposed by Melanie Klein?**
- A. Paranoid schizoid position
 - B. Reaction formation
 - C. Splitting
 - D. Depressive position
 - E. Projective identification
- 8. With which of the following developmental phases is Margaret Mahler associated?**
- A. Anal phase
 - B. Autistic phase
 - C. Conventional morality phase
 - D. Individuality vs inferiority phase
 - E. Operational stage
- 9. Avoiding the awareness of some painful aspect of reality by negating sensory data is called**
- A. Reaction formation
 - B. Projection
 - C. Denial
 - D. Suppression
 - E. Repression
- 10. Which of the following is NOT a mature defence mechanism?**
- A. Isolation
 - B. Altruism
 - C. Humour
 - D. Anticipation
 - E. Sublimation

11. Which one of the following terms was coined by Mary Ainsworth?

- A. Goodness of fit
- B. Anaclitic depression
- C. Transitional object
- D. Separation individuation
- E. Secure base

12. Which of the following statements about attachment theory is INCORRECT?

- A. Abused children do not develop attachments to their abusive parents.
- B. The attachment of the firstborn child is decreased by the birth of a second.
- C. Stranger anxiety develops by 8 months.
- D. Separation anxiety occurs by 10–18 months of age.
- E. Children brought up in extended families or with multiple caregivers are able to establish many attachments.

13. A boy recognizes that the amount of water remains the same when transferred from a tall narrow glass to a wide-mouthed glass. Which stage of Piaget's developmental model is he likely to have attained?

- A. Sensorimotor stage
- B. Preoperational stage
- C. Concrete operational stage
- D. Formal operational stage
- E. Conventional stage

14. Which of the following is NOT a projective test?

- A. Rorschach ink-blot test
- B. MMPI
- C. Sentence completion test
- D. Thematic apperception test
- E. Draw a person test

15. A 30-year-old man presents to rehabilitation services following a head injury. Which of the following is the LEAST useful test to measure premorbid IQ in this patient?

- A. Wechsler's Adult Intelligence Scale
- B. National Adult Reading Test
- C. Cambridge Contextual Reading Test
- D. Spot the Word Test
- E. Wechsler Test of Adult Reading

16. Choose a suitable test to assess frontal lobe functions in a man suffering from head injury:

- A. Rey Osterreith test
- B. MMSE
- C. Wisconsin Card Sorting Test
- D. Stanford Binet Scale
- E. WAIS

17. Among the WAIS subtests, performance on which of the following is relatively resistant to decline with ageing?

- A. Digit symbol
- B. Digit span
- C. Block design
- D. Similarities
- E. Picture completion

18. Which of the following is NOT a bedside cognitive test?

- A. Halstead Reitan Battery
- B. Frontal Assessment Battery
- C. Verbal fluency
- D. Category test
- E. Go-no go test

19. Which of the following scales used in antidepressant trials is most sensitive to detect any change in the severity of depression?

- A. HAMD
- B. MADRS
- C. BPRS
- D. BDI
- E. PANSS

20. While using a diagnostic rating scale, a psychologist tries to find the degree of correlation between one test item and the other items in the scale. What is he trying to measure?

- A. Internal consistency
- B. Content validity
- C. Construct validity
- D. Split half reliability
- E. Test-retest reliability

- 21. The results of a child's IQ test relate significantly to the occupational success he achieves when he grows into an adult. The test is said to have a high**
- A. Construct validity
 - B. Predictive validity
 - C. Incremental validity
 - D. Face validity
 - E. Content validity
- 22. Which of the following is a structured diagnostic instrument used in population surveys to measure disease prevalence?**
- A. Young Mania Rating Scale
 - B. Positive and Negative Symptoms Scale
 - C. Hospital Anxiety and Depression Scale
 - D. Composite International Diagnostic Interview
 - E. Brief Psychiatric Rating Scale
- 23. Chris was confronted by a snake while hiking in a tropical forest. He later argued that the 'fear' he experienced was due to the tremors, muscle tension and sweating that occurred immediately upon seeing the snake. Which of the following theories is he using to explain the origin of his emotions?**
- A. Cannon–Bard theory
 - B. James–Lange theory
 - C. Two-factor theory
 - D. Opponent-process theory
 - E. Schachter–Singer theory
- 24. A psychiatrist wants to use a self-administered scale to assess the presence of depressive symptoms in a community-resident elderly patient. Which one of the following will he use?**
- A. The Centre for Epidemiologic Studies Depression Scale (CES-D)
 - B. The Carroll Rating Scale for Depression
 - C. The Geriatric Depression Scale (GDS)
 - D. Brief Psychiatric Rating Scale
 - E. Hamilton Depression Rating Scale
- 25. Matthew is a 3-year-old boy referred to the local Child and Adolescent Mental Health Services (CAMHS) team with a history of poor scholastic performance. Which of the following scales is considered appropriate to evaluate his intelligence quotient?**
- A. Stanford–Binet Scale
 - B. Denver Developmental Scale
 - C. Wechsler's WAIS-R
 - D. Wechsler's WISC III
 - E. Wechsler's WPPSI

26. Classical conditioning has occurred when

- A. Unconditioned stimulus produces unconditioned response
- B. Conditioned stimulus produces the conditioned response
- C. Unconditioned stimulus produces the conditioned response
- D. Conditioned stimulus produces another conditioned stimulus
- E. None of the above

27. Repeated presentations of the conditioned stimulus in the absence of the unconditioned stimulus leads to a decrease in the strength of the conditioned response. This is known as

- A. Extinction
- B. Generalization
- C. Higher order conditioning
- D. Inhibition
- E. Recovery

28. When Little Albert was conditioned to be afraid of white rats he also came to fear white lab coats and other white objects. This phenomenon is known as

- A. Extinction
- B. Satiation
- C. Generalization
- D. Discrimination
- E. Punishment

29. The process by which the response to a stimulus declines with repeated exposure to that stimulus is known as

- A. Conditioning
- B. Sensitization
- C. Boredom
- D. Generalization
- E. Habituation

30. In a behavioural treatment, every time a person drinks alcohol, he is administered an electric shock. Which of the following principles underlie this treatment?

- A. Cognitive therapy
- B. Punishment therapy
- C. Systematic desensitization
- D. Aversive conditioning
- E. Psychodynamic therapy

- 31. A 19-year-old girl visits the London Dungeon. Her startle response increases with each fearful stimulus. This phenomenon is related to**
- A. Sensitization
 - B. Habituation
 - C. Systematic desensitization
 - D. Relaxation
 - E. Counter conditioning
- 32. A 40-year-old lady is waiting to see her dentist after three painful extractions. She could hear the noise made by the dentist's drill. This makes her feel anxious. This anxiety could be termed as which one of the following?**
- A. Unconditioned stimulus
 - B. Conditioned stimulus
 - C. Conditioned response
 - D. Unconditioned response
 - E. None of the above
- 33. Whenever Jack had to feed his pet dog, he would ring a bell in order to get its attention. He would stop ringing the bell before he served the meat. As days passed, the dog started salivating to the sound of the bell. Which of the classical conditioning paradigm is being used here?**
- A. Trace conditioning
 - B. Backward conditioning
 - C. Delayed conditioning
 - D. Temporal conditioning
 - E. Simultaneous conditioning
- 34. Habitual consumption of paracetamol to relieve headache is related to which one of the following phenomena?**
- A. Aversion
 - B. Positive reinforcement
 - C. Classical conditioning
 - D. Negative reinforcement
 - E. Punishment
- 35. Dave meets his girlfriend at a pub daily at 8 O'clock. As the time approaches, he keeps looking out for her more and more frequently through the window. This behaviour is suggestive of which of the following schedules of reinforcement?**
- A. Fixed interval
 - B. Fixed ratio
 - C. Differential
 - D. Variable ratio
 - E. Regular

36. Which of the following schedules would most probably produce the greatest resistance to extinction?

- A. Fixed interval
- B. Fixed ratio
- C. Variable ratio
- D. Differential ratio
- E. None of the above

37. According to Skinner, a reinforcement is defined as any event that

- A. Decreases a behaviour
- B. Increases a behaviour
- C. Increases or decreases a behaviour
- D. Is satisfying to the person
- E. Substitutes a punishment

38. Which one of the following is a true statement about learned helplessness?

- A. It was originally used as a cognitive model for depression.
- B. It occurs when met with uncontrollable aversive stimuli.
- C. It was first described by Beck.
- D. It is one of the cognitive triads of depression.
- E. None of the above.

39. According to Seligman, people are more prone to develop phobia towards which one of the following?

- A. Electric heaters
- B. Knives
- C. Hot ovens
- D. Electric iron
- E. Darkness

40. A person who has never flown develops a fear of flying. Which one of the following best explains the above process?

- A. Vicarious learning
- B. Flooding
- C. Operant conditioning
- D. Shaping
- E. Mowrer's hypothesis

41. Which of the following is not a part of gestalt theory of perception?

- A. Continuity
- B. Figure ground
- C. Proximity
- D. Shape constancy
- E. Closure

- 42. Mark's neighbours were robbed when they were on holiday. On hearing the news, he said to his wife, "They are such a careless lot. They must have left their doors unlocked. This will never happen to us". He blamed the neighbours to minimize the apparent likelihood of a similar mishap to himself. This is best explained by**
- A. Defensive attribution
 - B. Fundamental attribution error
 - C. Actor–observer bias
 - D. Stereotyping
 - E. Self serving bias
- 43. Dave attributed his success in the Part 1 exam to his hard work and extensive knowledge of the subject. But when he fails his Part 2 he blames it on the examination system being poorly standardized. This is an example of**
- A. The actor/observer effect
 - B. Defensive attribution
 - C. Stereotyping
 - D. Self-serving bias
 - E. Individualism
- 44. Holiday makers who pay hundreds of pounds for a trip to a water theme park will rate the park favourably even if it was boring and mundane. This can be explained using which one of the following?**
- A. Self serving bias
 - B. Learning theory
 - C. Actor observer bias
 - D. Dissonance theory
 - E. Fundamental attribution theory
- 45. A depressed person who failed his recent maths exam says 'I am stupid; I get everything wrong and will never pass any test'. The style of attribution in the above statement is**
- A. Internal, unstable, and specific
 - B. Internal, stable, and global
 - C. Internal, stable, and specific
 - D. External, stable, and unspecific
 - E. External, stable, and specific
- 46. In a famous experiment of animal behaviour, newly hatched goslings were observed to follow the actively moving experimenter. This process, where some young animals learn to follow the first encountered moving object, is explained by which of the following?**
- A. Vicarious learning
 - B. Learning theory
 - C. Imprinting
 - D. Cognitive dissonance theory
 - E. Premack's principle

- 47. 'If you eat your spinach, you can have your dessert'. This is an example of which one of the following?**
- A. Cognitive dissonance theory
 - B. Attitude behaviour similarity theory
 - C. Inoculation theory
 - D. Attitude incongruity
 - E. Premack's principle
- 48. Brian is dressed shabbily when he walks into the New Year party for junior doctors. When he finds everyone in the room to be dressed at their best, he feels depressed and unattractive. Which of the following can explain the above?**
- A. Social inadequacy theory
 - B. Ideas of self reference
 - C. Social comparison effect
 - D. Conformity theory
 - E. Social incompetence effect
- 49. In a medical careers fair, most psychiatry trainees are noted to form a small social group on their own. The principle by which we categorize and identify ourselves as psychiatrists is explained by which one of the following?**
- A. Social identity theory
 - B. Self-reference effect
 - C. Social comparison effect
 - D. Social confirmity
 - E. Social incompetence
- 50. Harry was recently diagnosed with an advanced carcinoma of the lung. He goes through a phase where he blames himself for the illness and asks 'why me?'. Which one of the following stages of reaction to impending death is he in?**
- A. Denial
 - B. Anger
 - C. Bargaining
 - D. Depression
 - E. Acceptance
- 51. After breaking up with her boyfriend, Tanya says, "I don't think I have control over what is happening in my life". Which of the following statements would describe Tanya?**
- A. She is a person with a high self esteem
 - B. She is a person with a great sense of direction
 - C. She is a person with an external locus of control
 - D. She is a person with an internal locus of control
 - E. She is a person who has achieved self actualisation

52. A girl of age 2 years searches for her father when he leaves the room and is delighted when he enters the room.Which of the following phenomena explains this behaviour?

- A. The girl has achieved object permanence
- B. The girl has achieved semiotic function
- C. The girl has achieved syllogistic reasoning
- D. The girl has achieved hypotheticodeductive reasoning
- E. The girl has achieved the principle of centration

53. In Harlow's classical study of rhesus monkeys, the baby rhesus monkeys preferred soft-clothed, non-feeding surrogate mothers to hard, wire mesh, but food-providing surrogate mothers.This illustrated the concept of

- A. Imprinting
- B. Individuation
- C. Insecure attachment
- D. Contact comfort
- E. Object relation

54. Predictors of delinquency include which of the following?

- A. Family history of aggression
- B. Family poverty
- C. Low IQ
- D. Lack of parental supervision
- E. All of the above

55. Ryan is late for his WPBA meeting with his supervisor.After waiting for half an hour at the bus stop, he realizes that all buses in this route have been cancelled due to bad weather. He swears and kicks a can of Coke lying on the ground in anger.Which of the following would best explain this behaviour?

- A. Ryan is angry with the litter on the ground
- B. Ryan is less polite when he is waiting for buses
- C. Frustration is associated with arousal
- D. Waiting for buses lead to an increase in blood pressure
- E. Bad weather leads to an increase in blood pressure

56. Immigrant children in the UK tend to prefer the norms of their peers in the new culture compared to parental norms.Which one of the following could explain this?

- A. Immigrant children don't like their original culture
- B. Immigrant children are compelled by their teachers to act like their peers
- C. Immigrant children want to pretend they are not immigrants
- D. Immigrant children need to act this way in order to survive at school
- E. Peers have more influence in transmitting cultural practices than parents

- 57. In spite of making a resolution to stop drinking, you place an order for a pint of lager when you see your friends place their order for drinks. Which of the following could explain the above phenomenon?**
- A. Conformity
 - B. Obedience
 - C. Ignorance
 - D. Acculturation
 - E. Readiness
- 58. In a famous experiment conducted by Milgram in the 1960s, a ‘teacher’ was instructed by an ‘experimenter’ to deliver shocks of high voltage to the ‘learner’ every time he made a mistake. Which of these factors influenced the decision by the ‘teacher’ to obey the ‘experimenter’?**
- A. Diffusion of responsibility
 - B. Perception of legitimate authority
 - C. Persuasion techniques used by the authority
 - D. Obedience to authority
 - E. All of the above
- 59. There are five female PhD students living in a hostel for thirty at the university. Considering the girls to be the minority group, when will the group become influential in the hostel?**
- A. If they are consistent with their views
 - B. If they are joined by other girls and outnumber the majority
 - C. When they complete their PhD
 - D. When they spend a lot of money to influence the office bearers
 - E. If the minority consist of older people
- 60. Tony was considered to be a silent, shy and well behaved boy by his family and friends. At a rock concert he attended on his own, Tony was thrown out because of disorderly behaviour, which they considered to be out of character. His behaviour can be explained by the theory that when we are in a group which guarantees anonymity, we tend to**
- A. Accept our individuality
 - B. Become frustrated
 - C. Assume an alternate identity
 - D. Become disinhibited secondary to deindividuation
 - E. Hide from the rest of the group
- 61. A pianist is performing at a recital. According to the social facilitation theory which of the following is likely to happen?**
- A. His performance can either improve or worsen in front of the audience
 - B. His performance will improve when being observed
 - C. His performance will worsen when being observed
 - D. He will be supported by his community on contracting a disease
 - E. He would be eligible for social benefits if he worked in a band rather than on his own

62. A commercial sex worker receives an educational session regarding safe sexual practices from a health professional. She does not make any immediate change in her attitude or behaviour but agrees with the importance of such safe practice. Which of the following phases of Prochaska's Transtheoretical Model of Change is she in?

- A. Preparation
- B. Precontemplation
- C. Contemplation
- D. Action
- E. Maintenance

63. A frail-looking young man suddenly collapses on a busy market street and starts throwing a fit. In spite of the presence of many members of the public, no one comes forward to help him. Which of the following best explains the above observation?

- A. Social equity norm
- B. Diffusion of responsibility
- C. Social exchange theory
- D. Guilt
- E. Altruism

64. After receiving a small gift from a pharmaceutical representative, we feel indebted to prescribe the promoted drug. Which of the following could explain this behaviour?

- A. Social exchange theory
- B. Equity and equality norm
- C. The reciprocal norm
- D. Social responsibility
- E. Guilt

65. Margaret is 73-year-old. According to Erikson, she is most probably in the stage of

- A. Integrity versus despair
- B. Intimacy versus isolation
- C. Trust versus distrust
- D. Autonomy versus shame and doubt
- E. Industry versus inferiority

- 66.** Chris is planning his stag party. He knows the average number of cans of lager a person is likely to drink. From that he calculates the number of cans he will need to buy, and in turn the costs involved. During this complex mathematical calculation, he manipulates numbers in his memory. Which of the following types of memory is he most likely to be using?
- A. Iconic memory
 - B. Implicit memory
 - C. Episodic memory
 - D. Working memory
 - E. Semantic memory
- 67.** A college student who last swam when he was 12 years old is surprised by his ability to swim when pushed into the pool during a party. Which of the following cognitive capacity could explain the above phenomenon?
- A. Procedural memory
 - B. Retrospective memory
 - C. State-dependent memory
 - D. Eidetic memory
 - E. Working memory
- 68.** A student preparing for a physics test learned the definitions of the following terms an hour before the test in this order: Hubble's law, gravity wave, fusion, special relativity, string theory, and M theory. Which of the following definitions is he likely to forget?
- A. Fusion, special relativity
 - B. Hubble's law and m theory
 - C. String theory and m theory
 - D. Hubble's law and gravity wave
 - E. Gravity wave and string theory
- 69.** The phase of human sexual response that occurs after desire is called
- A. Resolution phase
 - B. Plateau phase
 - C. Orgasmic phase
 - D. Excitement phase
 - E. Ejaculatory phase
- 70.** According to Maslow's Hierarchy of Needs Theory, at the times of natural disasters which of the following will be the most appropriate intervention?
- A. Provision of food and shelter
 - B. CBT to enhance self-esteem
 - C. Group therapy to enhance love and belongingness
 - D. Behavioural therapy to enhance safety behaviour
 - E. Meditation to achieve self actualization

1.C. All of the theories listed in the question except Individual Psychology Theory were proposed by Sigmund Freud. Individual psychology theory was put forward by Alfred Adler. According to Freud's Affect Trauma Theory, feelings that are connected to unacceptable memories are strangulated by mental mechanisms leading to neurosis. Freud divided neurosis into 'actual' and 'psychoneurosis'. Actual neurosis manifested itself in anxiety neurosis or hypochondriasis. Psychoneurosis comprised of hysteria, obsessional neurosis, and phobias. Freud thought that psychoneurosis was amenable to psychoanalysis. In the Topographical Model, the mind is divided into the unconscious, preconscious, and conscious. The Structural Model of the Mind consists of the id, ego, and superego (a useful mnemonic is that S of structural model is shared with superego). Freud also came up with the stages of psychosexual development. In this, each stage of development is thought to build on and to subsume the accomplishments of the preceding stage: the oral stage (12 to 18 months of life), anal stage (18 to 36 months), phallic stage (3 to 5 years), latency stage (5 to 11 years), and genital stage (11 years to adulthood). Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 195–200.

2.B. Primary process thinking fulfils the pleasure principle. According to Freud, in the Topographical Model of the mind, the unconscious system is characterized by primary process thinking. Primary process thinking refers to a mode of thinking whose main aim is to facilitate wish fulfilment. It is governed by the pleasure principle and does not follow a logical course. The concept of time is not used to streamline primary process thinking. In addition, primary process thinking allows contradictions to exist simultaneously. The conscious system receives sense impressions from the outside world and follows secondary process thinking. This is ruled by time, rational–logical thinking, and the reality principle.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 195.

3.A. The important functions of ego include the capacity to control the discharge of instinctual drives, the capacity to test reality, mediating between the id and the realities of the outside world (reality principle as against pleasure principle), and thus facilitating the formation of relationships. Judgement, which involves the ability to anticipate the consequences of actions, is also a function of the ego. In Freud's psychoanalytic theory of personality, the ego ideal is the part of the superego that includes the rules and standards for good behaviours (e.g. parental discipline).

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 200.

4.A. This is an example of transference during psychotherapy. Transference is the process by which the patient displaces wishes and feelings toward persons from the past onto the analyst. Sometimes this leads to the emergence of resistance as patients experience the psychiatrist as a parental figure from the past (in this case the patient's dead father), and they seek to rebel against the perceived parental control. Resistance refers to an unconscious behaviour intended to frustrate the progress of therapy. Free association is the process where the client spontaneously expresses their thoughts and feelings as they occur. Repression is a defence mechanism.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 337.

5.D. The phenomenon described is called condensation. According to Freud, a dream is the disguised fulfilment of an unconscious wish. Freud described two layers of dream content – the manifest and the latent. The manifest content is what the dreamer recalls; the latent content involves the unconscious thoughts and wishes that threaten to awaken the dreamer. The unconscious process by which latent dream content is changed into manifest dream is called the dream work. This dream work involves primary process revision (different from primary process thinking) and secondary revision/ elaboration. Primary process includes the mechanisms of condensation, displacement, and symbolic representation. Condensation, as described in this question, is the mechanism by which several unconscious wishes can be combined into a single image in the manifest dream content. Displacement refers to the transfer of energy from an original object to a different one. In symbolic representation of a wish or object, the original but highly unacceptable theme changes in physical qualities to a more acceptable object. This may be characterized by seemingly unrelated and absurd images. Secondary revision is the process by which dreams are made relevant and more rational when narrated to a third person.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 193

6.A. Adler coined the term inferiority complex which is a sense of inadequacy and weakness that is universal and inborn. Masculine protest is the tendency to move from a passive, feminine role to a masculine, active role. A child's self esteem may be compromised by a physical defect; this phenomenon is called organ inferiority. According to Adler's birth order theory the firstborn child reacts with anger to the birth of siblings and struggles against giving up the powerful position of being the only child. The second-born child must always compete with the firstborn. This apparently results in lifelong influences on character and lifestyle. All the above terms, including individual psychology, were proposed by Alfred Adler.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 214.

7. B. Reaction formation is one of many Freudian defences. Kleinian defences can be remembered using the mnemonic (SIPDOG – splitting, introjection, projective identification, denial, omnipotence, and grandiosity). According to Klein, projection and introjection are the primary defence operations in the first few months of life. Soon after birth and thereafter, the infant experiences a fear that he is falling apart. This fear of fragmenting or disintegration is central to further Kleinian processes. To deal with this fear, the infant resorts to splitting, introjection, and projection. All events and perceptions are schemed into good and bad elements (splitting); the good part gets introjected, while bad part is projected onto the mother leading to persecutory anxiety. At this stage, the infant is in a paranoid-schizoid position, where the capacity to integrate varied experiences into unified concept is lacking. Soon the baby comes to know that the mother he loved (when feeding) and the mother he hated (when hurt) are one and the same. Now the infant becomes concerned that he might destroy the mother due to his aggressive impulses, and the infant is said to be in a grief-like depressive position. Projective identification is a Kleinian defence mechanism where unwanted feelings are projected to the other person, and he/she is made to feel and act accordingly.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 340.

8. B. Margaret Mahler described the process by which children develop a separate identity from their mothers. She called this the theory of separation individuation (SI). Stages of separation individuation are: normal autism (birth to 2 months) where the infant sleeps most of the time, this phase is reminiscent of intrauterine life; Stage of symbiosis (2 to 5 months) where the mother and her child exist more or less as a single entity; differentiation (5 to 10 months), wherein physical and psychological distinctness from mother is gradually appreciated; practicing (10 to 18 months), where the child shows an increase in exploration of the outside world; rapprochement (18 to 24 months) where the child explores further away from the mother but on realizing the separation, comes back clinging; and object constancy (2 to 5 years) where the child realizes the permanence of the mother even when the mother is not from the vicinity (this is different from object permanence).

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 29.

9. C. This is denial. The defence of denial is usually an unconscious process (I love that man becomes I do not love that man). Projection is where specific wishes, impulses, and aspects of self are imagined to be located in some other object external to oneself (e.g. a miser calling others 'misers'). Projection is thought to be involved in the formation of persecutory delusions. Repression is expelling or withholding an idea or feeling from consciousness. Primary repression is when the idea has never reached consciousness at all. Secondary repression is when it has reached the conscious level at some time in the past, but is now not available for conscious processing. Suppression is consciously or semiconsciously postponing attention and response to an impulse or conflict. This is a mature defence mechanism. Reaction formation is the transformation of an unacceptable impulse to the very opposite (I love that man becomes I hate that man).

Rycroft C. *A Critical Dictionary of Psychoanalysis*, 2nd edn. Penguin Reference, 2005, p. 125.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/ Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 207.

10.A. Isolation is a neurotic defence. It is separating an idea from the emotion that accompanies it. Defence mechanisms can be psychologically healthy or maladaptive, though their primary aim is to reduce a psychological conflict. Psychologically healthy mechanisms can be grouped as mature defences. Various mature defence mechanisms include sublimation, altruism, humour, suppression, and anticipation. Altruism is using constructive service to provide for others without any conscious direct or indirect benefits. Humour is the process of using comedy to express feelings and thoughts without personal discomfort. Anticipation is realistically planning for a predicted inner discomfort. For example, a man with a terminal illness prepares his advance directives. Sublimation is achieving gratification by altering a socially objectionable aim or objective to a socially acceptable one. For example training as a surgeon if you have a desire to cut and make others bleed!

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 207.

11.E. According to Mary Ainsworth, attachment in infants helps to reduce separation anxiety. Infants use the attachment figure as a 'secure base' around which they can explore the environment. Chess and Thomas proposed the theory of goodness of fit. They studied the innate psychological characteristics of every infant known as temperament. According to them, goodness of fit results when the expectations and demands from mothers match the temperamental characters of the infant. Margaret Mahler described the theory of separation individuation. Anaclitic depression (hospitalism) was first described by Rene Spitz in infants who had made normal attachments but were then suddenly separated from their mothers and placed in institutions or hospitals. These infants developed depression that was anaclitic (loss of dependent object) and recovered when their mothers returned. Sometimes, inanimate objects, called transitional objects (Winnicott) also serve as a secure base; these transitional objects are often soft toys or other commonly encountered things that often accompanies children as they investigate the world. For example, Hobbes in Calvin and Hobbes comic strips.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 280.

12.A. Abused children often maintain their attachments to abusive parents. Attachment behaviour can increase in the presence of hunger, sickness, or pain. Similarly when children are rejected by their parents or are afraid of them, their attachment may increase to some extent. Attachment develops in almost all children, but whether this is of a secure or insecure nature depends on multiple factors. Separation anxiety is a universal human developmental phenomenon emerging in infants less than 1 year of age and marking a child's awareness of a separation from his or her mother or primary carer. Separation anxiety peaks between 9 and 18 months and diminishes by about 2.5 years of age, enabling young children to develop a sense of comfort away from their parents in preschool.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 137.

13.C. The concept of conservation develops in the stage of concrete operations. The primary sign that a child is still in the preoperational stage is that he or she has not achieved the concept of conservation or reversibility. Conservation is the ability to recognize that objects possess different compatible properties and the alteration of one property (e.g. height) does not necessarily alter other properties (e.g. volume). Conservation occurs in various dimensions – conservation of volume, quantity, number, area, and weight. Piaget's stages of cognitive development include sensorimotor stage, which begins at birth and lasts up to 2 years. Object permanence and insight is gained in this stage. During the stage of preoperational thought (2–7 years), the child develops symbolic play and semiotic function. Children in this stage are egocentric. In addition to conservation and reversibility, the child also develops syllogistic reasoning in the concrete operational stage (7–11 years). Formal operational stage (11 to the end of adolescence), is characterized by the development of the capability of hypothetico-deductive reasoning.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 136.

14.B. The projective tests of personality assessment make use of unstructured stimuli, for example inkblots or pictures from which stories have to be derived. It is thought that when confronted with a vague stimulus, subjects will introduce (project) some personality characteristics into the stimulus. This will be revealed not only in the way the ambiguity is perceived but also in the content of their responses. The Minnesota Multiphasic Personality Inventory (MMPI) is a self-report inventory with more than 500 true or false statements about oneself. It is an objective personality assessment instrument. The Rorschach Test is a standard set of ten inkblots which serves as the ambiguous stimulus for associations. In the Thematic Apperception Test (TAT) 20 stimulus cards depicting a number of scenes of varying ambiguity are used. Other projective tests include Draw a person test and sentence completion test.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, pp. 195–196.

15.A. Wechsler Adult Intelligence Scale (WAIS) has a number of subtests, each tapping different aspects of intelligence. Verbal IQ is calculated based on the sum of the following subtests: vocabulary, similarities, arithmetic, digit span, information, and comprehension. Performance IQ is calculated from the sum of the following subtests: picture completion, digit symbol coding, block design, matrix reasoning, and picture arrangement. Three further subtests (symbol search, letter-number sequencing, and object assembly) have been added in later versions. National Adult Reading Test (NART), Cambridge Contextual Reading Test, Spot the Word Test, and Wechsler Test of Adult Reading are best used to test premorbid IQ. These measures are based on the observation that reading ability is relatively preserved in the face of organic cognitive impairment and is highly correlated with intellectual ability in the general population.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, pp. 142–143.

16.C. The Wisconsin Card Sorting Test (WCST) is used to test set-shifting ability, which is thought to be a function of the frontal lobe. In Rey Osterreith Complex Figure Test (ROCF) a complicated figure is presented and the subject is required to copy it. The original and copy are then removed and the subject is asked to draw the figure again from memory, after varying delay intervals. This is not specific for frontal lobe functions. Stanford Binet Scale measures general intelligence. Mini Mental State Examination (MMSE) is a test of general cognition. In fact, it does not include any specific tests for frontal lobe function.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 146.

17. E. Tests on WAIS are either 'hold' or 'no hold'. The so called 'hold tests' in WAIS are thought to reflect the use of old knowledge and are relatively resistant to the effects of brain damage and ageing. These include vocabulary, information, object assembly, and picture completion. 'No hold' tests require speed of response, working memory, or the creation of new relations between unrelated items. These are more likely to show early decline with ageing and cognitive impairment. These include digit symbol, digit span, similarities, and block design. This is the reason why WAIS is not the best test to measure premorbid intelligence.

Groth-Marnat G. *Handbook of Psychological Assessment*, 4th edn. John Wiley & Sons, 2003, p. 178.

18. A. The Halstead Reitan Battery is composed of seven to ten tests. The battery can differentiate those who are brain damaged from neurologically intact persons. It usually needs to be administered by a trained neuropsychologist and is time consuming. Frontal Assessment Battery is a battery of six tests used to test frontal lobe function at the bedside. It includes verbal fluency, similarities, Luria three-step test, go–no go tests, and a test of environmental autonomy. In category test the subject must discover the common theme in a set of pictures presented. Category test measures concept formation and abstract reasoning. It is one of the tests included in the Halstead Reitan Battery. Verbal fluency is measured using the FAS test.

Groth-Marnat G. *Handbook of Psychological Assessment*, 4th edn. John Wiley & Sons, 2003, p. 520.

19. B. The Hamilton Rating Scale for Depression (HAM-D) and the Montgomery-Åsberg Depression Rating Scale (MADRS) are two widely used depression scales. HAM-D is relatively limited in measures of sensitivity and multidimensionality but it is very popular. The MADRS (10 items), designed to be sensitive to treatment changes, is briefer and more uniform. A limitation of the MADRS is the lack of a structured interview, which may affect reliability. The HAM-D and the MADRS are often used conjointly as endpoints in depression trials. There are various versions of the HAM-D, ranging from 17 to 31 items. The Brief Psychiatric Rating Scale (BPRS) comprises 16 items rated from 0 (not present) to 6 (extremely severe) and includes symptoms such as somatic concern, anxiety, depressive mood, hostility, and hallucinations. The scale was developed essentially for psychosis but also includes symptoms of depression. Positive and Negative Symptoms Scale (PANSS) is not a scale to measure depressive symptoms. It is used to measure the severity of psychotic symptoms. The Beck Depression Inventory (BDI) is a 21 question, self-report inventory. It is not a very useful measure of change in severity of depression with treatment.

Iannuzzo R, Jaeger J, et al. Development and reliability of the HAM-D/MADRS Interview: An integrated depression symptom rating scale. *Psychiatry Research* 2006; **145**: 21–37.

20. A. Internal consistency is the degree to which one test item correlates with all other test items. Reliability is the consistency of a measuring instrument or the repeatability of a test. Inter-rater reliability is the likelihood that two raters will rate the same answer in the same way. Test-retest reliability is the degree to which a test will give the same result on two different occasions, separated in time. Parallel-form reliability is the extent to which two comparable versions of a test give the same result. Split-half reliability is when a test is notionally split in two and the two halves correlated with each other.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 94.

21. B. Validity is a property that refers to whether a test measures what it is supposed to measure. Predictive validity is the degree to which a test predicts some criterion that might be achieved in the future (e.g. whether a child's IQ test predicts occupational success when he/she grows into an adult). A test is said to possess good concurrent validity if scores on the test correlate with a gold standard or other diagnostic test used for the same purpose (e.g. if scores on HAMD are higher in those people with a severe rather than mild or moderate depressive disorder according to ICD 10, then HAMD is said to possess high concurrent validity). The above two types of validity together constitute criterion validity. Face validity refers to whether a test seems purposeful and sensible with regard to the tested domain to the person completing it. Content validity refers to the representativeness and relevance of the assessment instrument to the construct being measured. Construct validity checks whether a test measures a specified and well-defined construct. For example, if a test is measuring depression, there should not be clusters of items that seem to measure symptoms of mania; the test should correlate with other measures of depression (convergent validity); it should not correlate with measures that are irrelevant to depression (divergent validity).

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 94.

22. D. The Young Mania Rating Scale (YMRS) comprises 11 items corresponding to the published core symptoms of mania. Four items are graded on a scale of 0–8 and have double weight; the remaining seven items are graded on a scale of 0–4. The Positive and Negative Symptom Scale (PANSS) is a 30-item rating instrument specifically designed to assess the psychopathology of schizophrenic patients. Subscores of the PANSS are positive, negative, general psychopathology, and affective symptoms composite scores. The Hospital Anxiety and Depression Scale (HADS) is a 14-item self-report scale that was developed originally to indicate the possible presence of anxiety and depressive states in medical outpatients. The Brief Psychiatric Rating Scale (BPRS) is a 16-item scale with nine general symptom items, five positive-symptom items, and two negative-symptom items. It is a clinician-completed scale often used in schizophrenia medication trials.

Spiegel R and Aebi HJ. *Psychopharmacology: An introduction*, 4th edn. Wiley, 2003, pp. 198–202.

23. B. He is using the James–Lange theory of emotions. According to the James–Lange theory of emotion, the perception of the stimulus leads to physiological arousal. The interpretation of the physiological arousal leads to the affective experience of the emotion. For example, 'I feel afraid because my heart is pounding'. According to Cannon–Bard theory, perception of an emotionally relevant stimulus leads to the physiological and emotional arousal at the same time. Cannon and Bard attributed this to stimulation of the hypothalamus and the autonomic areas at the same time. In the Schacter–Singer theory (two factor theory), a person labels the pounding of the heart as fear because he appraises the situation of being in the midst of a snake as dangerous. So according to Schacter, the same physiological feeling can elicit different emotions depending upon the appraisal made by the subject from his situation. For example, pounding of the heart can be due to fear of the snake, anxiety secondary to exams and joy (or fear!) of meeting one's spouse. Opponent-process theory is a theory of colour vision.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/ Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 190.

24.A. The CES-D is the most widely used screening instrument for depression in community-resident elderly because of the availability of normative population data. The GDS (Geriatric depression scale), developed specifically to screen older persons for the presence of depressive symptoms, has not been standardized for use in community populations. The Carroll Rating Scale for Depression, based on the Hamilton Depression Scale, has not been used extensively in elderly people. HAM-D includes many somatic elements of depression, which are often positive even in the absence of depression among elderly people due to high prevalence of physical health problems. It is observer rated and not self administered. BPRS does not look for the presence or absence of depression.

Radloff LS. The CES-D scale: A self report depression scale for research in the general population. *Applied Psychological Measurement* 1977; **1**: 385–401.

25.A. The Stanford-Binet scale is suitable for children between 2 and 4 years since it does not rely exclusively on language. It is also applicable for other age groups. The Denver Developmental Scale is used to assess the attainment of developmental milestones in children up to age 5. The WAIS-R (Wechsler Adult Intelligence Scale) is used for individuals aged 17 and over. The WISC III (Wechsler Intelligence Scale for Children) is useful for evaluating children aged 6–16. The WPPSI (Wechsler Preschool and Primary Scale of Intelligence) is used for children aged 4–6.

Groth-Marnat G. *Handbook of Psychological Assessment*, 4th edn. John Wiley & Sons, 2003, pp. 132–133.

26.B. The unconditioned stimulus (UCS) is a stimulus that evokes an unconditioned response (UCR) without previous conditioning, for example in the classic Pavlov's paradigm, salivation (UCR) with food (UCS). UCR is not a learned response. Conditioned stimulus (CS) is a previously neutral stimulus that has acquired the capacity to evoke a conditioned response (CR), for example the bell is the CS that is paired with food (UCS) which later elicits the salivation (now a CR). A first CS (CS1) that has previously been paired with a UCS can support conditioning to a second CS (CS2) when the CS2 and CS1 are paired together. Thus CS2, never directly paired with the UCS, still elicits a CR. This is higher-order conditioning.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 8.

27.A. Extinction is the process by which CR is eliminated. After conditioning a CS to elicit a CR, repeated, subsequent delivery of the CS without the UCS extinguishes the CR. Three factors influence the extinction of the CR. In general, the stronger the CS–CR bond, the slower the extinction of the CR. When the CS is only occasionally presented during initial conditioning, resistance to extinction is increased. As the duration of the CS exposure in extinction increases, the CR weakens proportionately. Spontaneous recovery is the reappearance of an extinguished response after a period of non-exposure to the conditioned stimulus.

Weiten W. *Themes and Variations*, 3rd edn. Brooks/Cole, 1995, p. 218.

28.C. Stimulus generalization occurs when an organism that has learned a response to a specific stimulus responds in the same way to new stimuli that are similar to the original stimulus. In this case, the colour white serves as the similarity between rats and lab coats. The closer the new stimuli are to the original conditioning stimulus, the greater the likelihood of generalization. Stimulus discrimination occurs when an organism that has learned a response to a specific stimulus does not respond in the same way to new stimuli that are similar to the original stimulus. For example, a dog which wags its tails when it hears your car approaching the porch may initially wag when any car passes by (generalization). But as time goes, your faithful dog learns to discriminate the distinct sound of your car from your father-in-law's car, who you may not like very much! The 'Little Albert' experiment mentioned in this question was conducted by Watson and Rayner in 1920. Albert was 11 months and 3 days old at the time of the first test. Because of his young age, the experiment today would be considered unethical.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 107.
Harris B. Whatever happened to Little Albert? *American Psychologist* 1979; **34**: 151–160.

29.E. Habituation and sensitization are two fundamental learning processes. In each case, animals change their reactions to a stimulus with repeated stimulation. Habituation is defined as a decrease in responsiveness to a stimulus, for example you may get habituated to the pressure on your toes from a new shoe when you wear it regularly. Sensitization refers to an increase in reactivity to the stimulus on repeated exposure, for example repeated listening to the new ring tone of your mobile may make you attend to the call quicker than on the first few days of buying the phone.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 107.

30.D. Aversive conditioning makes use of the classical conditioning paradigm. Here an unwanted behaviour is paired with an aversive stimulus, thus eliciting an aversive response. Here the shock is not given as a punishment but it is given as an unconditioned stimulus (UCS) to which an unconditioned response (UCR), pain, will be elicited. By repeated pairing of alcohol (conditioned stimulus, CS) with electric shock, the pain (aversion) becomes a conditioned response (CR). Later drinking alcohol (CS) alone is expected to produce the CR of aversion and pain. Typically, a short, delayed conditioning paradigm is used (see Question 33), that is the patient is asked to pour alcohol into his mouth and half a second later a shock is delivered to his hand via an electrode.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, pp. 10–11.

31.A. This is an example of sensitization. Systematic desensitization is a therapy based on conditioning procedures that can be effective in the elimination of conditioned fear and the reduction of phobic behaviour. It has three steps: relaxation training, hierarchy formation, and exposure to the stimuli. By remaining relaxed while imagining the lowest item in the hierarchy, the fear of that situation or object is counter conditioned. In a similar fashion counter conditioning then proceeds to situations higher in the hierarchy.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 107.

32.C. The anxiety produced by the sound is the conditioned response (CR). Pain produced by the situation of drilling is the UCR. This is called fear conditioning and is one of the theories to account for the origin of phobias. When this classical conditioning paradigm is combined with operant conditioning, in the form of avoidance (negative reinforcement), a phobia is likely to have developed. So in fully developed dental phobics, not only there is anxiety produced by the noise of the drill, but also avoidance of the situation by not keeping the appointment (or waiting outside the waiting room). The stimulus itself may become generalized to a fear of all drills.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, pp. 15–16.

33.A. This is an example of trace conditioning. There are five paradigms that are used in classical conditioning. They differ with respect to how a CS is paired with a UCS. In delayed conditioning, the onset of the CS precedes the onset of the UCS and termination of the CS occurs either with the onset of the UCS or during UCS presentation. In trace conditioning, the CS is presented and terminated prior to the onset of the UCS. In simultaneous conditioning, the CS and the UCS have onsets at the same time. In backward conditioning, the UCS is presented and terminated before the onset of the CS. In temporal conditioning, the UCS is presented at regular time intervals allowing the timing of the UCS to serve as the CS eliciting the CR. Short delayed conditioning is the best arrangement that facilitates the acquisition of most conditioned responses. Ideally the delay between the onset of CS and UCS should be about half a second.

Weiten W. *Themes and Variations*, 3rd edn. Brooks/Cole, 1995, p. 218.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, pp. 3, 4.

34.D. Negative reinforcement occurs when a response is strengthened because it is followed by the removal of an aversive stimulus. In this case, the headache. Other types of negative reinforcement include escape and avoidance learning. The term negative reinforcement should not be confused with punishment, which is an event following a behaviour which reduces the behaviour; for example stopping rash driving after getting a speeding ticket. Positive reinforcement occurs when a response is strengthened because it is followed by the presentation of a rewarding stimulus. For example a prize given for a desired behaviour increases the behaviour. It should be noted that both positive and negative reinforcements increase the behaviour in question. Punishment, on the other hand, decreases the behaviour.

Weiten W. *Themes and Variations*, 3rd edn. Brooks/Cole, 1995, p. 230.

35.A. In operant conditioning, the relationship between a response and the likelihood of reinforcement is known as a schedule of reinforcement. There are two major classes of schedules: (1) ratio schedules require a certain number of responses to produce reinforcement, and (2) interval schedules require a certain amount of time to elapse since the last reinforced response. Both types are subdivided into fixed and variable. In a fixed ratio schedule, a fixed number of responses produce the reinforcement. For example, a rat is reinforced every 10 times it presses the lever. In variable ratio schedule, an average number of responses produce the reinforcement. It is similar to fixed, but here the frequency of behaviour required to elicit the reinforcement changes after each reinforcement, for example slot machine in the casino pays off once every 10 times on an average, so it can take five attempts for some while 15 attempts for others. The fixed interval schedule involves a contingency in which reinforcement for a response is produced only after a specified period of time has elapsed since the previous reinforced response, for example students earn grades after a test every 3 weeks. In this case, they don't read during the initial weeks, but start reading just before the exam, that is the response increases just before the reinforcement. The variable interval schedule is the same as a fixed interval schedule, except that the interval changes after each reinforced response, for example repeatedly dialling a phone number till one gets through to a lucky draw contest. When reinforcement depends on both time and number of responses, the contingency is called a differential reinforcement schedule.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 14.

36. C. Reinforcement for an operation in operant conditioning can be provided at various schedules. When every operation is reinforced this is called continuous schedule. Intermittent reinforcement can occur at a fixed ratio (every third operation is rewarded), variable ratio (random rewards for operations), fixed interval (operation that takes place at every fourth minute is rewarded), or variable interval (random time intervals for reward delivery). Though learning is relatively slower, resistance to extinction increases with partial reinforcement. The variable ratio schedule is the most difficult to extinguish. This is the principle behind slot machines and gambling addiction.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 14.

37. B. Reinforcement occurs when an event following a response increases an organism's tendency to make that response. Primary reinforcers are events that are inherently reinforcing because they satisfy biological needs, for example food, water, sex, etc. Secondary or conditioned reinforcers are events that acquire reinforcing qualities by associating with primary reinforcers, for example money, good grades in exams, praise, etc.

Weiten W. *Themes and Variations*, 3rd edn. Brooks/Cole, 1995, p. 222.

38. B. The concept of learned helplessness was proposed by Martin Seligman. Seligman noted that when an animal is confronted with aversive stimuli from which escape is impossible, the animal stopped trying to escape. This was initially used as a behavioural model for depression. Cognitive triad of depression was first proposed by Aaron T Beck. The triad consists of a negative view of self, the world, and the future, that is worthlessness, helplessness, and hopelessness. The triad forms the theoretical basis for cognitive therapy in depression.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 790.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 16.

39. E. Seligman's concept of stimulus preparedness involves a species-specific inclination to be conditioned in certain ways. He believed that this was a product of evolution and was necessary for the survival of species. Accordingly, genuine threats to the survival of our ancestors easily elicit phobic responses in humans, for example snakes, darkness, etc. Hence it is more common for people to develop snake phobias than to develop sheep phobias, even though they may never have had any direct adventure with a snake.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 107.

40. A. Observational or vicarious learning (proposed by Albert Bandura) occurs when one's behaviour is influenced by observing models. A model may be any significant person or even an incident on television. So a person may develop a fear of flying after seeing an air disaster in a movie or a hijacking event on the television. Shaping is the progressive reinforcement of responses that are close to a desired response. This progressive reinforcement is continued until the desired response (usually a complex behaviour) is elicited. It is based on operant conditioning and works as the principle behind training animals to do circus tricks. Mowrer's hypothesis puts forth a two-staged acquisition process for phobia wherein, initially, classical conditioning associates a fear response to a neutral stimulus. Later, through operant conditioning, this fear is maintained, as avoidance of the feared stimulus serves as a potential negative reinforcer. Note that in the scenario portrayed in this question there has been no previous exposure to the feared stimulus (flying). Hence operant conditioning and Mowrer's hypothesis can be safely ruled out.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 108.

41.D. Gestalt principle of perception is a theory of sensory information processing. Initially, any figure must be separated from its background. This is called the figure ground principle. The actual perception of the figure as a whole usually follows the principles of grouping. These are proximity, similarity, continuity, simplicity, common fate, and closure. The gestalt principle is based on the top-down processing of perception, that is a whole picture makes more sense and is easier to understand than parts of the same picture. In a similar sense, presenting letters one by one in random order of R, O, K, W, is more difficult to process than presenting the word WORK. The opposite, bottom-up processing, refers to a progression from individual elements to the whole. For example, bottom-up processing occurs when children initially learn to spell words. They initially identify each letter and then go on to learn the whole word. A perceptual constancy is the tendency to experience an object as the same thing in spite of continually changing sensory input, for example we recognize an open door and a closed door as a door, irrespective of the differing geometry. Perceptual constancy includes concepts of size constancy, shape constancy, etc.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 244.

42.A. Defensive attribution is a tendency to blame victims for their misfortune, so that one feels less likely to be victimized in a similar way. It also helps people to maintain their belief that they live in a just world. For example assuming that victims of a burglary were careless. Attributions are inferences that people draw about causes of events and behaviours – both their own and other person's behaviours. Internal attribution attributes the cause to personal disposition. External attributions ascribe the cause to situational demands and environmental reasons. Fundamental attribution error refers to the process where an observer attributes others' negative behaviour to their internal attributes. The systematic bias in attribution, when one's own behaviour is assessed favourably compared to others' behaviours, is called the actor–observer bias.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 218.

43.D. Self-serving bias is said to occur when a person attributes his success to personal factors, while attributing his failures to external factors. It is a type of fundamental attribution error. Illusory correlation occurs when people estimate that they have encountered more confirmations of an association than they have actually seen, for example after meeting one dishonest lawyer, a person makes a statement 'I have never seen an honest lawyer'. Stereotypes are widely held beliefs that people have certain characteristics because of their membership in certain groups, for example lawyers are dishonest. Individualism is the process of defining one's identity in terms of personal attributes rather than group membership. Collectivism is when one's identity is defined in terms of group membership. Fundamental attribution error is seen less in collectivist cultures. Self-serving bias is seen more in individualistic Western culture. Naïve psychology, or common sense psychology, refers to certain propositional beliefs we hold about the actions and intentions of others in every-day life. These beliefs are socially conditioned and are necessary for human interaction. For example when someone waits in a queue to buy a train ticket, we infer that the person is travelling somewhere. These propositional ascriptions are not experimentally tested but heuristic and, in some cases, probabilistic assumptions.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 218.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 402.

44. D. This is an example of postdecisional cognitive dissonance. Cognitive dissonance occurs when there is discord among a person's different beliefs or behaviours. When a person experiences cognitive dissonance he/she changes his/her thinking or behaviour to lessen the disharmony. For example the owner of an expensive Porsche experiences a cognitive dissonance when the car breaks down on the motorway. He always believed that 'Porsches do not break down'. Now he looks for alternative explanations. As a result of this dissonance he may change his belief as follows: 'This is just a one-off event; this cannot happen again'.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, pp. 222–224.

45. B. According to Seligman's modified theory of learned helplessness, depressed patients usually have attribution styles that are internal, stable, and global. It is 'internal' as they make causal attributions to internal personal traits rather than external events. These attributions are called stable as they are fixed and held in spite of evidence to the contrary. They are global as they encompass all areas of functioning, for example in the scenario in Question 45, the person attributes to himself being stupid (negative and internal), will never pass a test (stable), and gets everything wrong (global).

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 219.

46. C. Imprinting, first described by Konrad Lorenz is a form of learning that occurs in the very early life of certain animals. The exposure to a stimulus must occur during a critical period, though this could be of a short duration. Imprinted associations are very resistant to change. Lorenz described newly hatched goslings that are programmed to follow a moving object, typically the mother, but in this experiment followed Lorenz because he was the first moving object they came in contact with. Imprinting does not depend on any reinforcement and it is not clear whether this occurs in human infants and all primates.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 159.

47. E. Premack's principle is based on the concept that high-frequency behaviour can be used to reinforce a low-frequency behaviour. In this particular example, children eat a lot of sweets (high-frequency behaviour), but this can be made contingent on eating their greens (low-frequency behaviour), thus increasing this behaviour (also called the Grandma's rule).

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 146.

48. C. The Social Comparison Theory was developed by Festinger. It refers to an individual's drive to look around him in the society to evaluate his own abilities. When the individual compares himself to someone who is deemed socially better, it is called an upward social comparison. The opposite is called a downward social comparison. Often individuals try to compare themselves with someone with whom they should be reasonably similar, for example their peers. The Self-Referential Encoding (SRE) effect holds that information relating to the self is preferentially encoded and organized above other types of information.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, pp. 469, 433.

49.A. Social Identity Theory is concerned with explaining when and why individuals act as part of social groups. At the psychological level it tries to answer why individuals identify with the group that they are a part of. At a social level, it tries to explain why individual interactions are different from interaction between individuals as members of different groups. The main concepts of social identity include:

1. Categorization, where we categorize ourselves, for example 'Doctors can be physicians or surgeons' (this categorization allows significant assumptions to be drawn about one's identity);
2. Identification, where we associate with our specific group (in-groups), which serve to raise our self esteem, for example 'I am a surgeon and not a physician';
3. Comparison, where we compare our groups with other groups, usually with a bias favouring ourselves, for example 'Psychiatrists are better thinkers than surgeons'.

Social comparison refers to comparing oneself with one's peers while social coherence refers to identifying commonalities with the wider social network.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 433.

50.B. The stage of dying described in this scenario corresponds to that of 'anger'. Kubler-Ross described the five stages of dying in her book 'Death and dying'. According to her theory, people's reaction to impending death follows five stages. The first one being a state of denial, where the person is in a state of shock and denies the diagnosis of terminal illness. He may blame the doctor for giving him a wrong diagnosis. The second stage is that of anger, where the person becomes irritable and frustrated, often asking the question 'Why me?' blaming himself or even God for being in the state he is in. In the third stage of bargaining, the person may try to negotiate with the doctor or family members or God to alleviate his illness in exchange of good deeds. Stage four is that of depression, where the cognitive triad of hopelessness, helplessness, and worthlessness are demonstrable. This may require treatment with antidepressant if severe. The fifth and final stage is of acceptance where the patient acknowledges and comes to terms with the inevitability of his/ her death.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 62.

Kubler-Ross E. *On Death and Dying*. New York: Macmillian, 1969.

51.C. Locus of control is a concept proposed by Julian Rotter as a part of his social learning theory of personality. Those with external locus of control attribute their successes and failures to external factors, for example luck, fate, etc. They believe that outcomes are largely out of their control. Those with an internal locus of control believe that success and failures are determined by their own action and abilities. There is some evidence suggesting that people with a high external locus are prone to more psychological problems. People with a high internal locus of control tend to be more successful. People with an external locus of control may be more prone to develop an equivalent of learned helplessness. For a given subject, locus of control may differ based on the issue considered. Consider the example – a person may feel that the political situation in his country is uncontrollable (external), but his own personal situation may be considered to be well under his control (internal).

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 203.

52.A. Object permanence is the understanding that an object tends to exist even when it cannot be seen or touched. Piaget argued that very young infants did not have a concept of durability of objects, that is 'out of sight is out of mind'. He claimed that the concept of object permanence was achieved by infants only during the late sensorimotor stage (at around 9 months). More recently this has been challenged by some studies (Hood and Willatts), which state that infants may start developing object permanence even as early as 5 months. Semiotic function is the process where children start to use a symbol or sign to represent an object. For example drawing is a semiotic function which may signify something in the real world. Semiotic function emerges during the preoperational stage. Syllogistic reasoning is the process by which a logical conclusion is formed from two ideas. For example crows are birds (premise 1); birds lay eggs (premise 2); therefore crows lay eggs (conclusion). This is developed during the stage of concrete operations. Centration is the tendency to focus on just one aspect of a problem, neglecting other important features. Centration is considered to be one of the basic flaws in cognition, which leads to the inability of the child to understand the concept of conservation in preoperational stage. Hypotheticodeductive reasoning is considered to be the highest order of reasoning, where a person can develop a hypothesis and test it to reach conclusions. This function usually develops in the formal operational stage according to Piaget.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, pp. 135–137.

Hood B and Willatts P. Reaching in the dark to an object's remembered position: Evidence for object permanence in 5-month-old infants. *British Journal of Developmental Psychology* 1986; **4**: 57–65.

53.D. Harry Harlow in his famous experiments in the 1950s separated rhesus monkeys from their mothers during their first weeks of life. Harlow substituted a surrogate mother made from wire or cloth for the real mother. The infants preferred the cloth-covered surrogate mother, which provided contact comfort, to the wire-covered surrogate, which provided food but no contact comfort. Harlow suggested that the infant monkeys depended on its mother not only for nourishment, but also for physical warmth and emotional security, which he termed 'contact comfort'. This is an important concept in attachment. Harlow's experiment refuted the hypothesis that attachment occurs as a result of positive reinforcement to feeding. Imprinting is associated with Konrad Lorenz and geese. Harlow was not an object relation theorist; Klein, Fairburn, and Guntrip are considered to be object relation analysts.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 28.

54.E. Farrington *et al.* (see reference below) in their Cambridge study in delinquent behaviour identified the following predictors of delinquency:

1. Antisocial behaviour and conduct traits beginning in early childhood (before age of 8);
2. Inattention (symptoms suggestive of ADHD);
3. Low intelligence and poor school attainment;
4. Family criminality;
5. Family poverty;
6. Large family size; and
7. Harsh parenting style with lack of parental supervision.

Farrington DP. Key results from the first forty years of the Cambridge Study in Delinquent Development. In: TP Thornberry and MD Krohn, eds. *Taking Stock of Delinquency: An Overview of Findings from Contemporary Longitudinal Studies*. New York: Kluwer Academic/ Plenum Press, 2002, 137–183.

55. C. John Dollard's frustration-aggression hypothesis states that aggression invariably stems from frustration and frustration in turn leads to aggression by arousing an individual. But frustrated individuals may react in various ways including resignation, depression, and despair. As a corollary not all aggression results from frustration, for example aggression exhibited during sporting activities such as boxing.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 151.

56. E. An immigrant child often tends to conform to the norms of the peer group in his/her host country. Acculturation is the process of behavioural and attitudinal changes as a result of exposure to the practices of a different dominant group, usually seen in people who have immigrated. Children of immigrants born in the host country may achieve a high level of acculturation. The level of acculturation may differ in children born in the host country and those born elsewhere but later migrated to a host country. The degree and nature of the acculturation process is affected by age at immigration, number of years in the host country, language proficiency, and participation in the host culture's social activities, which is likely to be higher in school children, who are in constant contact with their peers, compared to adults.

Martin A and Volkmar FR, eds. *Lewis's Child and Adolescent Psychiatry: A Comprehensive Textbook*, 4th edn. Lippincott Williams & Wilkins, 2007, p. 58.

57.A. Conformity occurs when people yield to real or imagined social pressure. If one listens to rock music in order to avoid being ridiculed by one's friends and not because of one's passion for the music then this exemplifies conformity. The famous Asch's studies in the 1950s provided most experimental background for studying conformity. Asch found that conformity was dependent on group size and group unanimity. People are more likely to conform when they are in ambiguous situations or when they have reasons to doubt their own judgement. Conformity is different from obedience. Obedience follows orders, comes from an authoritative figure, and the subject who obeys usually has no or reduced responsibility compared to the one who makes active decisions.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, pp. 204–206.

58. E. Obedience is a form of compliance that occurs when people follow direct commands, usually from someone in a position of authority. Diffusion of personal responsibility, legitimacy of the authority asking one to obey, strong persuasion techniques employed by the authority, and ingrained habit of obeying our parents and teachers as children influence our decision to obey authorities. Social groups depend on a reasonable amount of obedience to function smoothly. In Stanley Milgram's experiment, the 'learners' were never really shocked. In fact the 'teachers' were the real experimental subjects, who believed that a shock was being administered. The "teachers" were asked to deliver the shock by an authoritative 'experimenter'. Milgram's experiments provided some explanations for certain aspects of human behaviour during atrocities such as the Second World War genocides.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 207.

59.A. The minority in a social community may feel marginalized when their rights and needs are ignored. Members of the majority may be persuaded or influenced to change their attitude towards the minority by various means in order to reduce conflict between the minority and the majority. In order to achieve this, the minority should present the required message consistently across all the members and through various time intervals. The minority should appear to be acting on principle and making personal sacrifice to become influential within a social group. Age composition or educational status of the minority does not have much effect on the overall influence posed by the minority in a group.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 205.

60. D. Deindividuation is a psychological state in which an individual's identity is lost among a collective mass of people and the markers of one's individual personality are conspicuously absent. Anonymity leads to deindividuation and we tend to lose our inhibitions. Deindividuation prevents people from following the prosocial norms of society because they are unidentifiable and therefore feel less pressurized to follow the societal norms. Generally, deindividuation increases aggression unless a group adheres to prescribed codes of practice.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 506.

61. A. According to the social facilitation theory, in the presence of others, a dominant response (i.e. a well-learned task) will improve, while a poorly learned response will worsen. For example a well-trained musician would, according to this theory, perform better in the presence of others, but a beginner will make more mistakes. It also depends on the involvement of the audience in the task and on the expectations of praise or criticism.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 204.

62. B. The Stages of Change Model by Prochaska and DiClemente are stages that a person goes through when involved in a behavioural change. This may include a change in substance misuse behaviour, starting daily exercise, going on a diet or changing a health-related behaviour, for example attempting to obtain a cervical smear. The first stage is precontemplation stage, where the person is not thinking of any imminent change and is happy the way things are. The second stage is contemplation where he is considering a change in the near future. Preparation is when he gets ready or prepares to make the change. Action phase is where he implements the change and in maintenance phase he decides to continue the change in behaviour and attempts to prevent relapse.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, pp. 125–126.

63. B. This observation is otherwise called the bystander apathy or bystander effect. People are less likely to provide help to someone in need if they are in a group rather than when alone. The probability of providing help decreases as the group size increases. One of the main reasons for the bystander effect is diffusion of responsibility, that is a thought that someone else might help. The other influencing factor is the perceived need for help. If it is an emergency situation, we are more likely to intervene and help. Altruism is a different concept and refers to selfless concern about the welfare of others that leads to helping behaviour.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, pp. 211–212.

64. C. The reciprocity norm is the situation where you help those who help you. This is a powerful social phenomenon utilized by pharmaceutical representatives. Social responsibility is the situation where you help those in need. Social exchange theory is a theory of interpersonal relationships. It regards relationships in terms similar to trading interactions. According to this theory, a relationship continues as long as both partners feel that the benefits of remaining in the relationship outweigh the costs of the same relationship. According to equity theory, a relationship is successful as long as both partners perceive that the individual outcomes from the relationship are proportional to their individual inputs.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 391.

Schetky DH. Conflicts of interest between physicians and the pharmaceutical industry and special interest groups. *Child and Adolescent Psychiatric Clinics of North America* 2008; **17**: 113–125.

65.A. This question tests one's knowledge of Erikson's stages of psychosocial development. Erikson's stages were based on the concept of epigenetic principles. Epigenetic principle states that development occurs in sequential, clearly defined stages, and that each stage must be satisfactorily resolved for development to proceed smoothly. If a stage is not resolved satisfactorily, it results in physical, social, emotional, and cognitive maladjustment. In the question, the lady is 73 years old and is most likely to be in the stage of 'Integrity versus despair', where a person has to resolve the crisis between integrity (feeling at peace with oneself and the world, with no regrets or recriminations) and despair (feeling that life was full of wasted opportunities, regrets, wishing to be able to turn back the clock and have a second chance).

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 207.

66.D. Short-term memory (referred to by some psychologists as working memory) is a limited capacity store that can maintain unrehearsed information for about 20 to 30 seconds. This duration can be increased by rehearsing. The short-term memory, classically, is also thought to have a capacity of storing seven plus or minus two items. Because of this limited capacity, improving short-term memory storage requires a process called chunking, where identical data are grouped strategically to constitute a single chunk or item. Baddeley proposed an architecture for working memory. According to him, working memory involves three main components: a central executive, two 'slave' systems (the phonological loop and the visuospatial sketch pad), and an episodic buffer. The central executive coordinates the slave systems; the phonological loop contains a phonological store and an articulatory control process and is responsible for inner speech and rehearsing; the visuospatial sketch pad is responsible for setting up and manipulating mental images; the episodic buffer integrates and manipulates material in working memory. A sensory memory store holds a large amount of incoming perceptual information for a very short time, usually a fraction of a second before it can be processed. This store for visual items is called iconic memory and for auditory information is called echoic memory. Sensory memories have a lot of content and are of very brief duration.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, pp. 283, 293.

67.A. Procedural memory is a type of memory wherein the knowledge of how to do things (procedures or skills, e.g. swim, ride a bike, typing, etc.) is stored. It may not be conscious. It is not easily communicable and practical demonstration is required. Declarative memory is something we are consciously aware of when we acquire it and we are able to communicate it to another person using language. Episodic memory is a declarative memory for events which can be recalled, for example remembering what one did last summer. It is defined by a specific time scale. Semantic memory is abstract knowledge retained irrespective of how or when it was acquired, for example 'oceans are large bodies of water'. There is no time element attached to semantic memory.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 292; Fig. 17.7.

68.A. The serial position effect occurs when people show better recall for items at the beginning and the end of a list compared to those at the middle. This effect includes two components – the primacy effect, which occurs when items near the beginning of the list are recalled better than other items, and the recency effect, which occurs when items at the end are recalled better than other items.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 160.

69. D. The stages of a normal male sexual response are desire, excitement, orgasm, and resolution. This is called the DEOR cycle. Traditionally it has also been described as the EPOR cycle, that is excitement, plateau, orgasm, and resolution. Sexual dysfunction can occur due to problems in any of the stages. Depression can lead to a loss of desire. Problems in the excitement phase can lead to erectile dysfunction; problems in the third stage can lead to premature ejaculation.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 682.

70. A. According to Maslow, human needs are arranged in a hierarchy. People must satisfy their basic needs before they can satisfy higher needs. Individuals usually progress upwards when their basic needs are relatively satisfied, but may regress back to lower levels. This is especially evident at times of huge natural disasters such as Tsunami or hurricanes. In order of needs, Maslow considered

1. Physiological needs (food, water etc)
2. Safety needs (shelter)
3. Belongingness and love needs
4. Esteem needs
5. Cognitive needs
6. Aesthetic needs
7. Need for self actualization

The latter is the individual's need to fulfill his/her maximum potential. Other therapies as mentioned in the question are pointless when disaster strikes, unless food and shelter needs are met at least partially.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 124; see Fig. 5.3

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1. Aripiprazole is

- A. A partial agonist at the dopamine receptor
- B. A full agonist at the dopamine receptor
- C. A dopamine receptor antagonist
- D. An inverse agonist
- E. A reuptake inhibitor at the dopamine receptor

2. Lofexidine is an

- A. Alpha 2 autoreceptor agonist
- B. Alpha 1 postsynaptic agonist
- C. Alpha 2 autoreceptor antagonist
- D. Alpha 2 heteroreceptor agonist
- E. Noradrenaline reuptake inhibitor

3. Which of the following is NOT a reuptake inhibitor?

- A. Cocaine
- B. Sertraline
- C. Clomipramine
- D. Bupropion
- E. Buspirone

4. Which of the following combinations is NOT paired correctly?

- A. Alprazolam: benzodiazepines
- B. Zopiclone: hypnotics
- C. Haloperidol: butyrophenones
- D. Phenytoin: anticonvulsant
- E. Acamprosate: opiates

5. Paralytic ileus is most likely to be associated with which one of the following antipsychotics?

- A. Olanzapine
- B. Haloperidol
- C. Clozapine
- D. Amisulpride
- E. Thioridazine

6. Which route is most liable for first-pass metabolism?

- A. Sublingual
- B. Intramuscular
- C. Subcutaneous
- D. Oral
- E. Inhalational

7. Which of the following statements regarding treatment adherence is FALSE?

- A. Non-adherence occurs in up to 10% of people with schizophrenia.
- B. Non-adherence increases relapse rate in schizophrenia.
- C. Non-adherence is associated with poor insight.
- D. Adherence is affected by the route of administration.
- E. Adverse effect is a major factor contributing to non-adherence.

8. If a young male is administered 400 mg of lithium once daily, the average time taken for lithium to reach a steady state in plasma is

- A. 1 day
- B. 2 days
- C. 10 days
- D. 4 days
- E. 8 days

9. A 45-year-old man with schizoaffective disorder is on lithium, sertraline, lorazepam, and olanzapine. He develops low sodium levels and complains of extreme lethargy. The most likely offending agent is

- A. Sertraline
- B. Lithium
- C. Olanzapine
- D. Benzodiazepines
- E. None of the above

10. Which of the following predisposes to a placebo effect?

- A. The expectation of adverse effects at the start of a treatment
- B. Aversive conditioning
- C. Premorbid neuroticism
- D. Coexistent emotional disturbances
- E. All of the above

11. Flumazenil can reverse the effects of an overdose of which of the following drugs?

- A. Opioids
- B. Ecstasy (MDMA)
- C. Nitrazepam
- D. Valproate
- E. Clozapine

12. Regarding depot preparations, which of the following statements is FALSE?

- A. Depot medications are useful in cases of non-compliance
- B. They undergo less first-pass metabolism than oral preparations
- C. There is less reversibility of side-effects
- D. Injection site reactions are a side-effect
- E. All antipsychotic depot preparations are oil based

13. Which one of the following is NOT a CYP3A4 inducer?

- A. St. John's wort
- B. Rifampicin
- C. Barbiturates
- D. Carbamazepine
- E. Fluoxetine

14. Which of the following statements about first-order kinetics is false?

- A. A fraction of the drug is eliminated per unit time
- B. Half-life of a drug is directly proportional to the volume of distribution of the drug
- C. Digoxin has a high volume of distribution
- D. Half-life of a drug is directly proportional to the clearance
- E. None of the above

15. Which of the following is a butyrophenone?

- A. Risperidone
- B. Quetiapine
- C. Haloperidol
- D. Chlorpromazine
- E. Clozapine

16. Which of the following medications is NOT associated with zero-order kinetics?

- A. Phenytoin
- B. Salicylates
- C. Theophylline
- D. Alcohol
- E. Haloperidol

17. In which of the following situations is a measurement of plasma concentration of a drug the least valuable?

- A. The drug has a wide therapeutic index
- B. The drug has a therapeutic window
- C. Unexplained toxicity at therapeutic dose
- D. Failure to respond to treatment
- E. Suspected interaction with a co-administered drug

18. The most probable diagnosis in a clozapine-treated patient who has persistent tachycardia, fatigue, fever, and eosinophilia is:

- A. Pulmonary embolism
- B. Paralytic ileus
- C. Agranulocytosis
- D. Myocarditis
- E. Atypical NMS

19. Which of the following patients is at a higher risk of developing lithium-induced hypothyroidism?

- A. 21-year-old man with bipolar disorder
- B. 33-year-old man with schizoaffective disorder
- C. 45-year-old woman with depression
- D. 14-year-old boy with learning difficulties and aggression
- E. All of the above are at same risk levels

20. Which one of the following regarding mirtazapine is true? It is

- A. A central alpha 2 autoreceptor antagonist
- B. A serotonin noradrenalin reuptake inhibitor
- C. A selective serotonin reuptake inhibitor
- D. A tricyclic antidepressant
- E. A dopamine noradrenaline reuptake inhibitor

21. Which one of the following regarding buspirone is true? It is:

- A. A tricyclic antidepressant
- B. A selective serotonin reuptake inhibitor
- C. A dopamine antagonist
- D. A partial 5HT agonist
- E. A partial adrenaline agonist

22. Which of the following drugs stabilizes dopamine release through its action on dopamine receptors?

- A. Aripiprazole
- B. Quetiapine
- C. Haloperidol
- D. Olanzapine
- E. Chlorpromazine

23. Which one of the following is NOT a cholinesterase inhibitor?

- A. Rivastigmine
- B. Donepezil
- C. Gallantamine
- D. Organophosphates
- E. Memantine

24. Which of the following drugs is NOT metabolized by CYP3A4?

- A. Clozapine
- B. Quetiapine
- C. Ziprasidone
- D. Sertindole
- E. Risperidone

25. Select one side-effect of antipsychotics that appears earlier than the others when initiating treatment:

- A. Tardive dyskinesia
- B. Akathisia
- C. Parkinsonism
- D. Hypothyroidism
- E. Weight gain

26. Which of the following antidementia drugs is/are prescribed for administration once daily?

- A. Rivastigmine only
- B. Donepezil only
- C. Galantamine only
- D. Both rivastigmine and donepezil
- E. Both galantamine and rivastigmine

27. The effect of paroxetine on sleep is mainly due to its action on

- A. 5HT_{1A}
- B. 5HT_{2A}
- C. 5HT₃
- D. Histamine receptors
- E. Cholinergic receptors

28. Which one of the following is NOT an idiosyncratic reaction?

- A. Neuroleptic malignant syndrome with antipsychotics
- B. Parkinsonism with antipsychotics
- C. Hepatotoxicity with valproate
- D. Stevens Johnson syndrome with carbamazepine
- E. Rash with lamotrigine

29. Which of the following is a dose-dependent side-effect?

- A. Hepatotoxicity due to naltrexone
- B. Agranulocytosis with clozapine
- C. NMS with antipsychotics
- D. Pancreatitis with valproate
- E. Toxic epidermal necrolysis with lamotrigine

30. Which one of the following affects blood levels of lithium?

- A. NSAIDS
- B. ACE inhibitors
- C. Thiazide diuretics
- D. Dehydration
- E. All of the above

31. Which of the following statements is true about plasma levels of clozapine?

- A. Plasma level monitoring is recommended once weekly for the first 6 months
- B. Plasma levels increase when a smoker stops smoking
- C. In schizophrenia, the recommended plasma level is 150 µg/l
- D. Plasma level is decreased by fluoxetine
- E. None of the above

32. A 'therapeutic window' is well established in which one of the following?

- A. Imipramine
- B. Lofepramine
- C. Nortriptyline
- D. Sertraline
- E. Citalopram

33. A 30-year-old man is started on amitriptyline. He develops dry mouth, constipation, and blurred vision. Action on which of the following receptors could explain the side-effects described?

- A. Dopamine
- B. Histamine
- C. Muscarinic
- D. Norepinephrine
- E. Serotonin

34. Which of the following is an example of a pharmacodynamic drug interaction?

- A. Antacids reduce absorption of chlorpromazine
- B. Valproate displaces warfarin from albumin
- C. Carbamazepine induces the metabolic enzymes
- D. Serotonin syndrome when SSRIs and TCAs are combined
- E. Lithium elimination is decreased by thiazides

35. Considering psychopharmacology in perinatal psychiatry, which one of the following is true?

- A. Absolute risk of Ebstein's anomaly in patients treated with lithium is 0.05 to 0.1%
- B. Low-potency, typical antipsychotics are preferred to high-potency drugs
- C. Tricyclic antidepressants should be avoided in pregnancy
- D. SSRIs do not cause neonatal withdrawal syndromes
- E. Animal studies have found no effect of psychotropic medication on brain development and behaviour of the fetus

36. Which one of the following is NOT a factor affecting the pharmacokinetics of drugs in elderly people?

- A. Fall in gastric pH
- B. Decreased hepatic blood flow
- C. Reduced glomerular filtration rate
- D. Increased proportion of body fat
- E. Decreased serum albumin

37. ECT is the first-line treatment for which one of the following?

- A. Life-threatening depression with refusal of fluid or food
- B. All cases of catatonia
- C. Treatment-resistant schizophrenia
- D. Psychotic depression
- E. Depression with psychomotor retardation

38. ECT has been found to be useful in which of the following conditions?

- A. Uncontrolled status epilepticus
- B. On-off phenomena in Parkinson's disease
- C. Neuroleptic malignant syndrome
- D. Hypopituitarism
- E. All of the above

39. Which of the following is an absolute contraindication for ECT?

- A. Pregnancy
- B. Intracranial mass
- C. Presence of a metal skull plate
- D. Presence of implanted pacemaker
- E. None of the above

40. Which of the following statements regarding memory problems associated with ECT is true?

- A. Amnesia is dependent on the dose of electricity.
- B. Amnesia is not related to electrode placement.
- C. Amnesia for personal events is more common than that for public events.
- D. ECT is commonly followed by persistent anterograde amnesia.
- E. None of the above.

41. The most common cause for mortality in ECT is

- A. Fracture of the dorsal vertebrae
- B. Cardiac arrhythmia
- C. Status epilepticus
- D. Herniation of the brain
- E. Electrical burns caused due to poor contact of electrodes

42. When comparing unilateral and bilateral ECT which of the following is true?

- A. Memory deficits are less common with bilateral than unilateral ECT
- B. Unilateral ECT is most effective at 2.5 times the seizure threshold
- C. Unilateral ECT is more effective compared to bilateral
- D. Bilateral ECT acts faster than unilateral ECT
- E. Unilateral ECT has better synergistic properties with antidepressants

43. Which of the following has the shortest plasma half-life?

- A. Zolpidem
- B. Zaleplon
- C. Zopiclone
- D. Temazepam
- E. Clomethiazole

44. An elderly gentleman recently started on a hypnotic complains of sneezing and conjunctival irritation. He was most probably started on which of the following drugs?

- A. Temazepam
- B. Melatonin
- C. Zopiclone
- D. Clomethiazole
- E. Zaleplon

45. Which of the following is the most potent depot antipsychotic in terms of mg per mg?

- A. Risperidone long acting
- B. Haloperidol decanoate
- C. Fluphenazine decanoate
- D. Flupentixol decanoate
- E. Pipotiazine palmitate

46. Which of the following antipsychotics is a drug of choice for a patient with hepatic impairment?

- A. Risperidone
- B. Amisulpride
- C. Olanzapine
- D. Quetiapine
- E. Aripiprazole

47. Which of the following antipsychotics has the LEAST effect on weight gain?

- A. Aripiprazole
- B. Olanzapine
- C. Quetiapine
- D. Risperidone
- E. Clozapine

48. Which of the following is a dibenzothiazepine in its chemical structure?

- A. Risperidone
- B. Clozapine
- C. Olanzapine
- D. Quetiapine
- E. Amisulpride

49. Which of the following is true about tardive dyskinesia?

- A. Develops in up to 50% of patients treated with schizophrenia
- B. Risk factor include being a young male with a history of mood disorder
- C. TD is said to be due to the down regulation of dopamine receptors
- D. Stopping the antipsychotics worsens TD temporarily
- E. Anticholinergics such as procyclidine are the treatment of choice

50. Which of the following drugs has the greatest effect on QTc interval?

- A. Quetiapine
- B. Thioridazine
- C. Olanzapine
- D. Aripiprazole
- E. Risperidone

51. Which of the following is potentially antagonistic at dopamine receptors?

- A. Imipramine
- B. Clomipramine
- C. Amoxapine
- D. Amitriptyline
- E. Nortriptyline

52. Which of the following tricyclic antidepressants is the preferred drug compared to the others listed when prescribed to a patient with cardiovascular illness?

- A. Imipramine
- B. Clomipramine
- C. Lofepramine
- D. Amitriptyline
- E. Nortriptyline

53. Which of the following is more common with SSRIs compared to TCAs?

- A. Switch to mania
- B. Seizures
- C. Parkinsonian side-effects
- D. Cardiac side-effects
- E. None of the above

- 54. Serotonin syndrome is possible when SSRIs are combined with which of the following?**
- A. Lithium
 - B. MAOIs
 - C. Sumatriptan
 - D. Tryptophan
 - E. All of the above
- 55. In a patient with depression, an SSRI would be the drug of choice, EXCEPT when**
- A. The patient has concomitant cardiac disease
 - B. Sedation is desired
 - C. There is a risk of overdose
 - D. History of intolerance to anticholinergic side-effects
 - E. Depression is associated with obsessive compulsive symptoms
- 56. Which of the following statements regarding drug interactions is true?**
- A. Salbutamol inhalers are safe in patients taking MAOIs.
 - B. Combining MAOIs and tricyclics could lead to severe postural hypotension.
 - C. MAOIs are sedating at therapeutic doses.
 - D. Moclobemide is not associated with tyramine reaction.
 - E. Incidence of hypertensive reaction in patients on MAOIs is less than 1%.
- 57. Which of the following is associated with leucocytosis?**
- A. Clozapine
 - B. Mianserin
 - C. Mirtazapine
 - D. Lithium
 - E. Carbamazepine
- 58. Which of the following is true with regard to lamotrigine?**
- A. Valproate decreases levels of lamotrigine
 - B. Carbamazepine increases the level of lamotrigine
 - C. Lamotrigine monotherapy has been found to be effective in bipolar mania
 - D. Lamotrigine induces cytochrome enzymes
 - E. Lamotrigine blocks voltage-dependent sodium channels
- 59. Which of the following is associated with inappropriate secretion of antidiuretic hormone (SIADH)?**
- A. Fluoxetine
 - B. Venlafaxine
 - C. Haloperidol
 - D. Amitriptyline
 - E. All of the above

60. Which of the following is LESS likely to cause a discontinuation reaction than others in the list?

- A. Venlafaxine
- B. Fluoxetine
- C. Paroxetine
- D. Citalopram
- E. Amitriptyline

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1.A. When a neurotransmitter has a stimulating effect on receptors, this leads to agonistic actions. Drugs which stimulate receptors similar to these neurotransmitters are therefore called agonists. Drugs which block the action of the neurotransmitter on the receptors are antagonists. They act only in the presence of the neurotransmitter and do not have any intrinsic activity on their own. Inverse agonists have the opposite action of an agonist. For example, instead of opening an agonist operated channel, they close the channel after binding to the receptor. Inverse agonists thus have intrinsic activity (can act even in the absence of neurotransmitter molecules in the vicinity) and so can also be blocked by the antagonist. Partial agonists act as net agonists in the absence of the neurotransmitter, but act as a net antagonist in the presence of the neurotransmitter. Aripiprazole is a partial agonist at the dopamine (D_2) receptor.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 532.

2.A. Lofexidine is an alpha 2 agonist which acts at the autoreceptor. When the presynaptic autoreceptors are stimulated, they generally stop the release of the particular neurotransmitter. Thus they act as a brake. Lofexidine stimulates the alpha 2 autoreceptors, thus stopping the release of noradrenaline into the synapse. The antagonists of autoreceptors increase the release of the neurotransmitter. In the case of serotonin, $5HT_{1B}$ are autoreceptors. Some alpha 2 receptors are found on serotonergic neurones and control the release of 5HT; these alpha 2 receptors are called heteroreceptors.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 459.

3.E. Buspirone is a partial agonist at $5-HT_{1A}$ autoreceptors and can influence the firing of serotonergic (5-HT) neurones. Neurotransmitters in the synaptic cleft are actively transported back into the presynaptic neurone by a reuptake pump. Most antidepressants block this pump, thus increasing the availability of the monoamine neurotransmitters. Cocaine is a dopamine reuptake inhibitor. Bupropion inhibits reuptake of both dopamine and noradrenaline.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, pp. 1279–1281.

4.E. Phenytoin is an anticonvulsant. Alprazolam is a benzodiazepine and it is not used as a mood stabilizer; valproate, lithium, lamotrigine, and carbamazepine can be considered as mood stabilizers. Haloperidol is a butyrophenone and not a phenothiazine. Acamprosate is used to treat alcohol dependence. It is not an opiate. It has a structure similar to GABA and it is thought to act via glutamate receptor mechanism. Zopiclone is not a benzodiazepine. It is a hypnotic classed with other 'Z drugs'; Z drugs are non-benzodiazepines which act on the GABA complex but at a slightly different site than benzodiazepines.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 1018.

5.C. Clozapine causes anticholinergic effects by blocking muscarinic (M3) receptors. This can cause side-effects such as dry mouth, constipation, loss of accommodation, and urinary retention. Constipation is a side-effect in around 15% of patients taking clozapine, and, in most, simple advice about diet and fluid intake is sufficient. More significant ileus is an uncommon but potentially more serious side-effect. It may particularly be associated with bowel surgery. It could potentially be fatal. Though isolated reports of similar problems with olanzapine and risperidone have been recorded, these are not well-established associations.

Taylor D et al., eds. *The Maudsley Prescribing Guidelines*, 8th edn. Taylor and Francis, 2005, p. 54.

6.D. Orally administered drugs reach the liver via the portal circulation. If hepatic metabolism is extensive, a large amount of drug will be removed during this first passage through the liver. Thus, even if a drug is extensively absorbed, first-pass removal will reduce its systemic availability. So, drugs administered parenterally may need lower dosage compared to the same compound taken orally. Apart from the liver, first pass metabolism also takes place in gut mucosa, muscle tissue, and lung parenchyma, albeit to a smaller extent.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1278.

7.A. Non-adherence occurs in up to 40–60% of patients with schizophrenia at any time. Adherence is a multidimensional and dynamic concept and it is not useful to consider adherence vs non-adherence as the only categories in the spectrum. Non-adherence is not exclusive to psychosis; it has also been recorded in other psychiatric disorders including depression. In fact, adherence is a problem even in non-psychiatric but long-term illnesses such as diabetes and hypertension. Side-effects are major factors in causing non-adherence. Depot preparations have better adherence rates, largely due to direct supervision and non-reversibility.

Lacro JP et al. Prevalence of and risk factors for medication non adherence in patients with schizophrenia: a comprehensive review of recent literature. *Journal of Clinical Psychiatry* 2002; **63**: 892–909.

8.D. The time taken for a drug to reach the steady state is the function of its half-life. If the drug is given regularly within its half-life, it will reach a steady state in the plasma in about four to five half-lives. In this case, Lithium has a half-life of nearly 24 hours. So if we give lithium once daily for 4 days, it would have reached a steady state, and a blood taken on the 4th or 5th morning 12 hours after the last dose will give the trough lithium level, which will be an estimate of the plasma level of lithium.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1279.

9.A. Hyponatraemia has a well-known association with the use of antidepressants, especially SSRIs. Elderly people and those medically frail are worst affected. Hyponatraemia can also confuse the picture of depression by inducing lethargy and fatigue. The propensity to cause hyponatraemia seems to be a class effect of antidepressants – so replacing an SSRI with another SSRI will not eliminate the risk completely. Carbamazepine is also associated with SIADH and hyponatraemia. Lithium causes nephrogenic diabetes insipidus and sodium levels are either normal or marginally high as a result. Antipsychotics are also reported to be associated with hyponatraemia, although SSRIs are more likely to be associated with this phenomenon.

Taylor et al., eds. *The Maudsley Prescribing Guidelines*, 8th edn. Taylor and Francis, 2005, p. 159.

10. E. Placebos can also have adverse effects. Some patients will not tolerate placebos despite the fact that they are inert, and suffer from adverse effects (called the nocebo phenomenon). Nocebo effects with medication include all complaints mistakenly attributed to the medication, such as symptoms of the illness itself, symptoms of stress and the emotional response thereto, symptoms that reflect the patient's normal physiology, and symptoms that reflect normal variations in health. Predisposing factors for a nocebo response include expectations of adverse effects at the onset of treatment, conditioning, wherein the patient learns from prior experiences to associate medication taking with certain somatic symptoms, predisposition due to gender (women complain more), neuroticism, hypochondriasis, a tendency to somatize, coexistent emotional disturbances, and situational and contextual factors that alter expectations or result in aversive conditioning.

Barsky AJ, Saintfort R, Rogers MP, and Borus JF. Nonspecific medication side effects and the nocebo phenomenon. *Journal of the American Medical Association* 2002; **287**: 622–627.

11. C. Flumazenil is an antagonist of benzodiazepine receptors at the GABA_A complex. It is used to reverse sedative effects of benzodiazepines used in anaesthesia and in management of benzodiazepine overdose. As a result of this effect, it can precipitate benzodiazepine withdrawal seizures and can also precipitate anxiety in patients with anxiety/ panic disorder. It is not used to treat benzodiazepine withdrawal symptoms. It is not useful for any other drug toxicity or abuse as mentioned in the question. Naloxone is used in opioid overdose.

Taylor et al., eds. *The Maudsley Prescribing Guidelines*, 8th edn. Taylor and Francis, 2005, p. 317

12. E. Depot antipsychotic drugs have the following advantages: they decrease the risk of problems associated with medication non-compliance and undergo significantly less first-pass metabolism. The disadvantages include the fact that, once injected, the drug cannot be removed and hence adverse effects or adverse drug interactions are less reversible. An associated complication is injection site reaction. Depot risperidone is an aqueous suspension of risperidone in a glycolic acid–lactate copolymer matrix. The copolymer is slowly hydrolysed, resulting in the gradual release of risperidone. As depot risperidone is water based, it causes fewer reactions than the other oil-based preparations.

Grant S and Fitton A. Risperidone: a review of its pharmacology and therapeutic potential in the treatment of schizophrenia. *Drugs* 1994; **48**: 253–273.

13. E. Fluoxetine is an inhibitor of CYP450 enzymes. CYP1A2 is inhibited by fluvoxamine and duloxetine, and induced by phenytoin. CYP2D6 is inhibited by fluoxetine, paroxetine, sertraline, and duloxetine. CYP3A4 is inhibited by fluoxetine, nefazodone, and sertraline and is induced by carbamazepine, phenobarbital, and phenytoin. CYP2C9/10/19 is inhibited by fluvoxamine, fluoxetine, moclobemide, sertraline, and minimally by venlafaxine. St John's wort induces CYP3A4. CYP3A4 metabolizes carbamazepine, oral contraceptives, atypical antipsychotics, Z hypnotics, benzodiazepines, and calcium channel blockers.

Taylor et al., eds. *The Maudsley Prescribing Guidelines*, 8th edn. Taylor and Francis, 2005, p. 180

14. D. In first order kinetics, a constant fraction of the drug in the body is eliminated per unit time. The rate of elimination is proportional to the amount of drug in the body. The majority of psychiatric drugs are eliminated in this way. Volume of distribution is the amount of drug in the body divided by the concentration in the blood. So a drug that is highly lipid soluble and redistributes into fat has a high volume of distribution (Vd). These drugs stay out of the blood most of the time and, as a result, will have a long half-life. The lesser the clearance of the drug, the longer the half-life; so half-life is inversely proportional to the clearance. Digoxin is highly lipid soluble and has a long half-life.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1287.

15. C. Risperidone is a benzisoxazole; quetiapine is a dibenzothiazepine; clozapine and is a dibenzodiazepines; olanzapine is a thienobenzodiazepine; sulpiride and amisulpiride are substituted benzamides; chlorpromazine is a phenothiazine; and haloperidol is a butyrophenone. Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 259.

16. E. Zero-order kinetics occurs when the body metabolizes a constant amount of the drug. The metabolic pathway is rapidly saturated, leading to a limit being set for drug elimination. So only a constant amount of drug is eliminated irrespective of plasma levels, for example our body can metabolize around 1 unit of alcohol per hour; if you have taken 4 units, it will take 4 hours for the alcohol to get out of your system. So the time taken is directly proportional to the amount consumed, unlike in first-order kinetics where it takes four to five half-lives for the drug to get out of the system, irrespective of the dose consumed. The most important difference to remember is that a constant fraction (percentage) is eliminated in first-order kinetics while a constant amount is eliminated in zero-order kinetics.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1287.

17. A. Measurement of plasma level is not routinely done for most of the available psychotropic medications. But it is useful, and often indicated, when there is a therapeutic window, suspected drug interactions, unusual toxic reaction at therapeutic doses, and non-response to treatment in spite of administering adequate dose. Therapeutic window is a range of plasma concentration within which a drug produces the therapeutic response. If the level of drug is outside the defined 'window', the therapeutic response is inadequate. Therapeutic index is a ratio of median toxic dose to median effective dose of a drug. Failure to respond to treatment may be due to non-compliance, which can be detected in some cases by measuring the plasma levels.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 986.

18. D. Myocarditis is a fatal complication of clozapine use. It can occur very subtly with observable signs developing well after cardiac failure sets in. This is an idiosyncratic, eosinophilic inflammation of the myocardium. Persistent tachycardia, fever (flu like), chest pain, palpitations, dependent oedema, and signs of heart failure must prompt a detailed investigation, including cardiac enzymes (elevated), ECG (ST elevation), ESR (elevated), WBC (eosinophilia), and echocardiogram. With a good monitoring system in place for agranulocytosis, myocarditis is becoming a leading cause of clozapine-related fatalities.

Taylor et al., eds. *The Maudsley Prescribing Guidelines*, 8th edn. Taylor and Francis, 2005, p. 58.

19. C. It is well established that the risk of hypothyroidism related to lithium use varies widely across the population. Middle-aged women, who probably have a higher risk of having asymptomatic antithyroid antibodies before initiation of lithium, are at the maximum risk of clinical hypothyroidism (up to 20% prevalence). Importantly, this hypothyroidism does not correlate with the dose of lithium prescribed.

Taylor et al., eds. *The Maudsley Prescribing Guidelines*, 8th edn. Taylor and Francis, 2005, p. 113.

20. A. Mirtazapine is called a noradrenergic and specific serotonergic antidepressant (NaSSA). The therapeutic action of mirtazapine is due to central alpha 2 antagonist action, thus cutting the brakes for the release of norepinephrine (alpha 2 inhibitory autoreceptors) and serotonin (alpha 2 heteroreceptors constantly inhibit serotonin release too). Mirtazapine also acts as an antagonist at 5HT_{2A}, 5HT_{2C}, and 5HT₃ receptors, which may contribute to the favourable side-effect profile compared to SSRIs. Mianserin acts in a similar way. Mirtazapine does not block the reuptake pump.

Stahl SM. *Essential Psychopharmacology: Neuroscientific Basis and Practical Application*, 2nd edn. Cambridge University Press, 2000, p. 253.

21.D. Buspirone is a partial agonist at 5HT_{1A}. It is used in generalized anxiety disorder and as an augmenting agent to treat resistant depression. It does not have an action on the GABA receptors; hence it is free from interaction with alcohol and benzodiazepines. It does not lead to dependence or withdrawal symptoms with long-term use. It has a delayed onset of action similar to antidepressants.
Stahl SM. *Essential Psychopharmacology: Neuroscientific Basis and Practical Application*, 2nd edn. Cambridge University Press, 2000, p. 273.

22.A. Aripiprazole has been dubbed a dopamine system stabilizer due to its partial agonist action. It acts as an agonist where dopamine is depleted and acts as an antagonist where there is an excess of dopamine, making the availability of dopamine 'just right' for normal function.

Stahl SM. Dopamine system stabilizers, aripiprazole, and the next generation of antipsychotics, part 1, 'Goldilocks' actions at dopamine receptors. *Journal of Clinical Psychiatry* 2001; **62**: 841–842.

23.E. Memantine acts by partially blocking NMDA receptors, thereby preventing cell death related to calcium-mediated excitotoxicity. Donepezil is a non-competitive, reversible acetyl cholinesterase inhibitor (AChI). Rivastigmine is a non-competitive inhibitor for both butyryl cholinesterase and acetyl cholinesterase. Gallantamine is a competitive, reversible inhibitor which modulates nicotinic receptors. Tacrine is a non-competitive, non-selective, reversible inhibitor which acts both centrally and peripherally. It is no longer used because of high hepatotoxicity. Organophosphates are often used in pesticides and have acetyl cholinesterase-inhibiting properties.
Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 1033.

24.E. Among the antipsychotics, typical antipsychotics are mostly metabolized through CYP2D6. Risperidone is metabolized by CYP2D6. Clozapine and olanzapine are primarily metabolized through CYP1A2, and to a lesser extent, through the CYP 3A4 enzyme system. Olanzapine is also metabolized through the CYP3A4 enzyme system. The other antipsychotics listed in Question 24 are metabolized through the CYP3A4 system.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 547.

25.B. Akathisia occurs within hours to days after onset of antipsychotic treatment in most vulnerable cases. Prevalence is thought to be around 25%. It has both a subjective component of inner restlessness and an objective motor restlessness, manifested as constant pacing, shuffling, or inability to stand still. A specific rating scale to measure akathisia is the Barnes Akathisia Rating Scale. It is to be distinguished from psychotic agitation as akathisia has been linked to suicide and violence. Akathisia can also be caused by serotonergic antidepressants that stimulate 5HT₂ receptors. A slow-developing form of akathisia, called tardive akathisia, may be particularly difficult to treat. There is also some evidence to say that persistent akathisia (especially the tardive variant) may predict the development of tardive dyskinesia in the future. Dystonic reactions can occur within minutes of administration of injectable antipsychotics in vulnerable individuals. They are less common with the atypical antipsychotics compared to highly potent, typical antipsychotics (prevalence 10%).

Taylor et al., eds. *The Maudsley Prescribing Guidelines*, 8th edn. Taylor and Francis, 2005, p. 76.

26.B. Donepezil is administered once daily. This is possible because of the extended half-life of donepezil compared to other antidementia drugs. Gallantamine and rivastigmine are administered twice daily. An extended release form of gallantamine is now available and this can be administered once daily.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 1035.

27. B. Unlike tricyclic antidepressants, most SSRIs have a disruptive effect on sleep, hence administered in the morning. Stimulation of serotonin 5HT_{2A} receptors in the brainstem sleep centres may cause rapid muscle movements called myoclonus during the night; it may also disrupt slow-wave sleep and cause nocturnal awakenings. 5 HT_{2A} and 5HT_{2C} are also responsible for the panic attacks and anxiety associated with SSRIs. 5HT₃ receptors are involved in the gastrointestinal side-effects like nausea and vomiting, mediated through their location at the chemoreceptor trigger zone. SSRIs generally have very much less or absent antihistamine or anticholinergic action, except paroxetine which has significant anticholinergic activity. The antidepressant action of SSRIs is thought to be mediated through the down-regulation of 5HT_{1A} autoreceptors.

Stahl SM. *Essential Psychopharmacology: Neuroscientific Basis and Practical Application*, 2nd edn. Cambridge University Press, 2000, p. 233

28. B. Side-effects are generally divided into two types. Dose-dependent side-effects can be predicted, for example postural hypotension or parkinsonian side-effects with antipsychotics. Dose-independent side-effects are either idiosyncratic or immune-mediated side-effects that cannot be predicted in a patient beforehand, for example anaphylactic reactions. Lamotrigine-induced rash is dose independent and often occurs during the early phase of treatment. Hepatotoxicity due to valproate and Steven Johnson syndrome related to carbamazepine are potentially life-threatening, idiosyncratic effects.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1282; Table 3.

29. A. Agranulocytosis can occur at any given dose of clozapine. It is not a dose-dependent effect. The risk of agranulocytosis is higher in the first year of clozapine therapy and gradually reduces over the course of treatment. Similarly, neuroleptic malignant syndrome is an idiosyncratic reaction which cannot be predicted in an individual patient. The most important clinical implication to remember is the fact that if a patient has an idiosyncratic side-effect, then this can reoccur at even small doses if rechallenged. Stopping the drug rather than lowering its dose is the appropriate management strategy in such cases. Naltrexone produces hepatocellular damage in proportion to the dose administered, especially in patients with pre-existing liver damage.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1282; Table 3.

30. E. The clearance of lithium is delayed by most non-steroidal anti-inflammatory drugs including cyclo-oxygenase 2 (COX-2) inhibitors. Thiazide diuretics increase the plasma concentration of lithium. Other drugs which increase the concentration of lithium include ACE inhibitors. SSRIs increase the risk of serotonin syndrome with lithium, while haloperidol and carbamazepine increase the risk of neurotoxicity without altering plasma levels.

Taylor et al., eds. *The Maudsley Prescribing Guidelines*, 8th edn. Taylor and Francis, 2005, p. 114.

31. B. Clozapine plasma level monitoring is indicated in patients who are not responding to standard doses of clozapine. A plasma level of 350 µg/l is reasonable for most patients. A full blood count is done initially weekly while starting clozapine, in accordance with the clozapine patient monitoring service guidelines. Smoking induces the enzymes that metabolize clozapine. Hence, stopping smoking can increase the levels of clozapine. Fluoxetine is an inhibitor of CYP1A2, which metabolizes clozapine and may increase the levels of clozapine. This may also be therapeutic at times, in patients who do not respond to a maximum dose of clozapine.

Taylor et al., eds. *The Maudsley Prescribing Guidelines*, 8th edn. Taylor and Francis, 2005, p. 47.

32.C. A therapeutic window is a range of concentrations of a drug measured in the blood that are associated with a good therapeutic response. Plasma concentrations outside this range are either too low to ensure a therapeutic response or so high that they induce toxic side-effects. There is no evidence to say that there is an established therapeutic window for neuroleptics. Lithium has a therapeutic window. Nortriptyline is the only medication in the list that appears to have an established therapeutic window, in the range of 50 to 150 ng/ml. This level is usually reached by doses ranging from 50 to 100 mg/day.

Leonard BE. *Fundamentals of Psychopharmacology*, 3rd edn. Wiley, 2003, p. 81.

33.C. The side-effects mentioned in the question are features suggestive of the action of the tricyclic antidepressant on muscarinic cholinergic receptors. This includes dry mouth, urinary retention, blurred vision, and constipation. Dry mouth may lead to caries teeth in the long term. In the case of overdose with TCA, the anticholinergic action can lead to confusion, coma, and death due to respiratory failure. Action on α -adrenoceptors, may result in postural hypotension, causing falls and injuries. Therapeutic action of TCAs is thought to be due to its inhibitor action on serotonin and norepinephrine reuptake pumps. Amoxapine is a tricyclic antidepressant of the dibenzoxazepine class, which has a dopamine receptor blocking effect. Amoxapine may be useful in cases of psychotic depression due to its dopamine blocking properties.

Henry JA. *Toxicity of newer versus older antidepressants*. *Advances in Psychiatric Treatment* 1997; 3: 41–45.

34.D. There are two main types of drug interactions, pharmacodynamic and pharmacokinetic. Pharmacodynamic interactions arise when one drug increases or decreases the pharmacological effect of a second drug that is given at the same time, for example the depressant action of alcohol is augmented by benzodiazepines. When one drug alters a pharmacokinetic component of another drug, thus causing a change in the concentration of the other drug, this is called a pharmacokinetic interaction, for example inhibition of CYP450 enzyme, displacement of a drug from protein binding, reduced renal excretion of a drug, etc.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 521.

35.A. Most psychotropic medications are best avoided in the first trimester. Caution should also be exercised at the time of delivery and early neonatal period. Most medications, including lithium, are secreted in breast milk and should be used with caution. TCAs and fluoxetine have the best evidence for safety in pregnancy. Lithium can cause Ebstein's anomaly (cardiac valvular deformity) and floppy baby syndrome in newborns. SSRI withdrawal may be seen in newborns, especially if the mother was on short-acting SSRIs immediately prior to delivery. With respect to antipsychotics, high potency drugs are preferred to low potency ones in pregnancy. Anticonvulsant mood stabilizers have a high risk of neural tube defects. Benzodiazepines have a high risk of cleft lip.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 523.

36.A. Gut motility and acid secretion decrease with age. Elderly people have more fat relative to muscle mass, less water, and less body protein than younger adults. This leads to an increase in volume of distribution and longer half-life of administered drugs; 35% of renal function is lost by 65 years of age. Gastric pH increases (not decreases, as indicated in the question) due to loss of acidity.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 486.

Taylor et al., eds. *The Maudsley Prescribing Guidelines*, 8th edn. Taylor and Francis, 2005, p. 299.

37.A. All of the given options may be considered as indications for ECT. But according to the Royal College of Psychiatrists and NICE (UK), ECT as a first-line treatment of choice must be restricted to suicidal patients and those whose illness is life threatening due to refusal of food and fluids.

National Institute for Clinical Excellence. *Guidance in the Use of Electroconvulsive Therapy* (Technology Appraisal Guidance 59). London: NICE, 2003.

38.E. ECT has been found to be useful in some physical conditions, including those listed in the question, as well as symptoms associated with tardive dystonia.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 1120.

39.E. There are no absolute contraindications for ECT. All the known contraindications are relative. Any medical illness that could compromise the patient's status under general anaesthesia is considered a relative contraindication. ECT has been reported to be safe in people with pacemakers and metal skull plates, though caution is needed. ECT is safe in pregnancy and is a preferred treatment in depressed, pregnant patients with a high risk to self or the baby.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 1120.

40.A. Amnesia is dependent on the dose of electricity that exceeds the threshold stimulus needed to elicit a seizure in a given patient. The higher the dose, the greater the memory disturbance. It is also dependent on the electrode placement and more severe with bilateral placement than unilateral. Remote memory loss for impersonal/ public events is more common than amnesia for personal events. ECT is rarely followed by persistent anterograde amnesia.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 568.

41.B. Mortality with ECT is about the same as that with general anaesthesia for any minor surgery. The American Psychiatric Association Task Force on ECT estimated that the ECT-related mortality rate is 1 in 10,000 patients or 1 in 80,000 treatments. ECT is considered a low-risk procedure, even in an elderly cardiac patient who, in the developed world, is fast becoming the modal candidate for ECT. It is noted that ECT is about 10 times safer than childbirth and, each year, approximately six times as many deaths in the USA are caused by lightning than by ECT. In those who die, the commonest cause is a cardiac event, usually an arrhythmia.

Abrams R. The mortality rate with ECT. *Convulsive Therapy* 1997; **13**: 125–127.

42.D. Overall, bilateral ECT has superior efficacy compared to unilateral, although bilateral is associated with more side-effects. Recent studies have shown that high-dose unilateral is better than low-dose bilateral in terms of side-effects and equivalent in terms of efficacy. When choosing right unilateral placement, a higher dose titration is preferred. If there is a need for urgent improvement, bilateral placement is recommended.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 567.

43.B. Z hypnotics are non-benzodiazepines which act at or close to the benzodiazepine receptor site in the GABA_A complex. Its action is reversed by flumazenil. Zaleplon has the shortest half-life (1 hour) among the sedatives listed in the question. Temazepam (5–11 hours) and clomethiazole (4–6 hours) are also used as hypnotics. They are usually prescribed short term for the induction of sleep, usually for not more than 2 weeks.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 529.

44. D. Clomethiazole is a hypnotic with anticonvulsant properties. It causes dependence and respiratory depression with alcohol. It is used in elderly people because of its relatively shorter half-life. Unwanted side-effects include sneezing, conjunctival irritation, and nausea.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 530.

45. E. Pipothiazine is the most potent in terms of dose-response of the depot neuroleptics; 5 mg of pipothiazine is equivalent to: 100 mg of haloperidol, 25 mg of risperidone, 25 mg of fluphenazine, 40 mg of flupentixol, and 200 mg of zuclopentixol.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 533.

46. B. Most antipsychotics, with the notable exception of amisulpiride, are highly lipid soluble and extensively metabolized by the liver. Amisulpiride is excreted unchanged by the kidney. Amisulpiride is also considered unique in that it is a highly selective dopamine D₂/D₃ receptor antagonist that binds preferentially to receptors in the mesolimbic system. It is also an 'atypical' antipsychotic despite having a different receptor-affinity profile compared to the other atypical antipsychotics (i.e. absence of serotonin antagonism). At low doses (50 mg), amisulpiride preferentially blocks presynaptic autoreceptors, producing an increase in dopamine release, leading to some amelioration of the dopaminergic hypoactivity seen in negative symptoms of schizophrenia and depression. At higher doses (400–1200 mg), the drug exerts its activity on postsynaptic D₃/D₂ receptors located in the limbic region and prefrontal areas, producing selective dopaminergic inhibition.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 533.

47. A. Clozapine and olanzapine produce the maximum weight gain among antipsychotics. Aripiprazole is considered to be weight neutral, according to the currently available data.

Ziprasidone, which is not marketed in the UK, is said to be associated with some weight loss.

Average increases reported during the first year are 5.3 to 6.3 kg for clozapine and 6.8 to 11.8 kg for olanzapine, with some subgroups gaining more than 20% of their initial body weight.

Moreover, Lieberman et al., found that weight gain appears to be a continuous process where no relationship exists between the dose of antipsychotics prescribed and degree of weight gain.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 532.

Lieberman JA, Stroup TS, McEvoy JP et al. Effectiveness of antipsychotic drugs in patients with chronic schizophrenia. *New England Journal of Medicine* 2005; **353**: 1209–1223.

48. D. Quetiapine is a dibenzothiazepine. It acts similar to clozapine; both drugs having a 'hit-and-run' profile on D₂ receptors. Quetiapine does not stay at the receptor site for a long time to produce extrapyramidal effects but instead it produces a transient blockade. This has been demonstrated using ¹¹C Raclopride PET studies.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 531.

Kapur S, Zipursky RB et al. A positron emission tomography study of quetiapine in schizophrenia: a preliminary finding of an antipsychotic effect with only transiently high dopamine D₂ receptor occupancy. *Archives of General Psychiatry* 2000; **57**: 553–559.

49. D. In tardive dyskinesia (TD) the movements can be choreiform, athetoid, dystonic, stereotypic, or a combination of these. They most commonly involve the orobuccal, lingual, and facial muscles. High risk groups include women, elderly, patients with underlying brain damage, those with mood disorder or schizoaffective illness, learning disability, and, curiously, patients with diabetes. It is seen in up to 20% of people on long-term antipsychotic medications. The pathophysiology behind TD is considered to be receptor up-regulation (increase in postsynaptic receptor numbers due to chronic pharmacological antagonism). So, increasing the dose of the offending drugs may suppress the dyskinetic movements for a short while. Anticholinergic drugs, on the other hand, may aggravate TD. Strategies for the management of tardive dyskinesia include gradual withdrawal of antipsychotic medication, a switch to clozapine, and discontinuation of the anticholinergic medication. Tetrabenazine has been considered to be effective as it depletes dopamine from nerve endings. This makes super-sensitivity reactions less likely in spite of an increase in receptor numbers. But the risk of depression is very high with tetrabenazine (similar to reserpine). Clonazepam, diazepam, vitamin E, and melatonin are other proposed management options.

Taylor et al., eds. *The Maudsley Prescribing Guidelines*, 8th edn. Taylor and Francis, 2005, p. 78.

50. B. Pimozide and thioridazine have been found to increase the QT interval. The QT interval (from the Q wave to the end of the T wave) varies with the heart rate, gender, and time of day. There are several different ways of correcting QT for heart rate (QTc), but the simplest method is using Bazett's formula. In this method, the corrected QT interval (QTc) is calculated by the equation $QT_c = QT/\sqrt{RR}$. It is, however, uncertain whether QTc has any greater clinical significance than the uncorrected QT interval. The normal QT interval is 340–430 ms, and irrespective of the heart rate, a QT interval >450 ms is probably risky. A prolonged QT interval can predispose to polymorphic ventricular arrhythmias (torsades de pointes).

Taylor et al., eds. *The Maudsley Prescribing Guidelines*, 8th edn. Taylor and Francis, 2005, p. 87.

51. C. Amoxapine is a TCA with fairly selective inhibition of noradrenaline reuptake. It also has D2 antagonist property. This pharmacological profile suggests a good option for the treatment of psychotic depression. But in addition to the side-effects of TCA, there is also an additional risk of side-effects associated with D2 antagonism.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 542.

52. C. Cardiovascular side-effects of tricyclics include hypotension and tachycardia. Conduction abnormalities, ECG changes, ventricular arrhythmias, and heart blocks are complications seen especially in people with pre-existing heart disease. Lofepramine is a tertiary amine which is metabolized to desipramine, a secondary amine. Inspite of being a tertiary amine, lofepramine is more selective for norepinephrine reuptake inhibition. It has a better side-effect profile compared to other TCAs. It is also less cardiotoxic than other TCAs.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 543.

53. C. SSRIs are safer than TCAs as far as cardiotoxicity, switch to mania, and seizures are concerned. But SSRIs are more prone to cause extrapyramidal reaction, possibly due to an increase in serotonin at 5HT heteroreceptors on dopaminergic neurones. Some of the SSRIs may also have a low degree of intrinsic antagonistic action at the dopaminergic receptors.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 546.

54. E. Serotonin syndrome is a potentially fatal syndrome occurring in the context of initiation or dose increase of a serotonergic agent. This syndrome is characterized by altered mental state, agitation, tremor, shivering, diarrhoea, hyper-reflexia, myoclonus, ataxia, and hyperthermia. It could also occur during combination antidepressant therapy. These include medications that exert their primary action through the serotonin receptor (SSRI, SNRI, buspirone, etc), MAOIs, and serotonin precursor tryptophan. Serotonin toxicity is also reported to occur when SSRIs are combined with medications whose mode of action is not known (lithium) or medications which may inhibit CYP enzymes and increase SSRI levels in plasma. Sternbach's criteria are used to diagnose serotonin syndrome.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 870.

55. B. SSRIs are generally not sedating. Sometimes they can be activating, producing initial insomnia, anxiety, or panic attacks. They are relatively safer in overdose compared to TCAs. Apart from paroxetine and to some extent fluoxetine, most SSRIs have almost absent anticholinergic activity. SSRIs have been found to be more useful in obsessions than the other antidepressant groups.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 358.

56. B. Incidence of hypertensive reaction is about 10% in patients who take MAOIs. Tyramine is a substance usually metabolized by MAO A in the intestinal mucosa. In patients who are taking MAOIs, the breakdown of tyramine is not adequate, leading to the 'cheese reaction'. Salbutamol, being an agonist at the adrenergic receptor, could precipitate a hypertensive crisis in patients taking MAOIs. The combination of TCAs and MAOIs could potentially induce severe postural hypotension. Side-effects of MAOIs include anticholinergic side-effects and insomnia, rather than sedation. Phenelzine, tranylcypromine, and isocarboxazid are irreversible inhibitors and non-selectively bind to both MAO A and MAO B. Moclobemide is a selective and reversible MAOI. Although the incidence is less, tyramine reaction can occur even with moclobemide.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 551.

57. D. Lithium is associated with leucocytosis and could be used therapeutically for carbamazepine- or clozapine-induced leucopenia. All the other drugs in the question are associated with leucopenia and agranulocytosis as a result of idiosyncratic drug reaction.

Taylor et al., eds. *The Maudsley Prescribing Guidelines*, 8th edn. Taylor and Francis, 2005, p. 60.

58. E. Lamotrigine acts by blocking voltage-gated sodium channels associated with glutamate receptors. Carbamazepine is an enzyme inducer and decreases lamotrigine levels. Valproate is an enzyme inhibitor and increases lamotrigine levels. So combining lamotrigine with carbamazepine or valproate requires caution. Lamotrigine has been found to be effective as a monotherapy for bipolar depression. It has not been found to be effective in acute mania or relapse prevention of mania in bipolar disorder. Lamotrigine does not induce CYP450 enzymes.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 320.

59. E. SIADH is an idiosyncratic reaction in response to treatment with antidepressants, especially SSRIs. Old age, diabetes, hypertension, impaired renal function, and chronic obstructive pulmonary disease (COPD) are risk factors for SIADH. SIADH usually presents as unexplained weakness and lethargy. In severe forms it can cause confusion and delirium. Serum $\text{Na}^+ < 125 \text{ mmol/l}$ and a 24-h urine $\text{Na}^+ > 20 \text{ mmol/l}$ or osmolality $> 100 \text{ mosm/kg}$ are diagnostic indicators for SIADH. Withdrawal of the offending agent is the most effective intervention, apart from maintaining fluid balance. It is important to rule out other primary causes of SIADH before concluding it to be a drug-induced effect. It is known to occur with almost all classes of antidepressants.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 874.

60. B. Fluoxetine has a half-life of up to 72 hours. It also has an active metabolite with similar action, which prolongs the total duration of action up to 2 weeks (norfluoxetine). So, discontinuation reaction is less likely with fluoxetine. Paroxetine and citalopram have a half-life of 20 to 30 hours. Discontinuation reaction usually develops after at least a month of SSRI treatment and within 2–5 days after SSRI discontinuation or dose reduction. In general, gradual taper and stopping of the medications are indicated when SSRIs are used. Reinstatement of the same or a longer-acting SSRI can alleviate the symptoms, apart from using benzodiazepines. All classes of antidepressants are known to be associated with discontinuation reactions, including venlafaxine and amitriptyline.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 872.

- 1. Which one of the following was a proponent of humane and moral treatment of insanity?**
 - A. Anton Mesmer
 - B. Phillipine Pinel
 - C. Jacques Lacan
 - D. Emil Krapelin
 - E. Melanie Klein
- 2. Morel was a French–Austrian physician associated with the term demence precoce. He is also associated with which of the following theories?**
 - A. Regeneration theory
 - B. Devolution theory
 - C. Degeneration theory
 - D. Segregation theory
 - E. Integration theory
- 3. Neurasthenia was originally described by which one of the following?**
 - A. Beard
 - B. Freud
 - C. Jung
 - D. Adler
 - E. Engel
- 4. Inducing malarial fever was proposed as a treatment for which of the following diseases?**
 - A. Hysteria
 - B. Neurasthenia
 - C. Tourette's syndrome
 - D. General paralysis of the insane
 - E. Multiple sclerosis

- 5. Which one of the following hormones was used to induce coma in the treatment of schizophrenia?**
- A. Thyroxine
 - B. Cortisone
 - C. Testosterone
 - D. Insulin
 - E. Parathormone
- 6. Who among the following described hebephrenic schizophrenia?**
- A. Greisinger
 - B. Falret and Baillarger
 - C. Tuke
 - D. Hecker
 - E. Clouston
- 7. Which one of the following terms was coined by Esquirol?**
- A. Nymphomania
 - B. Monomania
 - C. Hypomania
 - D. Pseudomania
 - E. Pyromania
- 8. First-rank symptoms in schizophrenia were proposed by**
- A. Kurt Schneider
 - B. Carl Schneider
 - C. Manfred Bleuler
 - D. Eugen Bleuler
 - E. Emil Kraepelin
- 9. All of the following are correctly matched EXCEPT**
- A. Ribot: anhedonia
 - B. Sifneos: alexithymia
 - C. Kahlbaum: cyclothymia
 - D. Moreno: chorea
 - E. Cameron: overinclusion
- 10. The first antidepressants to be discovered were**
- A. SSRIs
 - B. MAOIs
 - C. TCAs
 - D. Amphetamines
 - E. Benzodiazepines

11. Case studies have been traditionally useful in studying brain-behaviour relationships. In one of such case study Phineas Gage, a railway worker, sustained damage to which of the following brain areas?

- A. Parietal lobe
- B. Hypothalamus
- C. Pineal gland
- D. Frontal lobe
- E. Temporal lobe

12. Lithium was used in which of the following medical illnesses before being rediscovered for mania?

- A. Gout
- B. Osteoarthritis
- C. Epilepsy
- D. Stroke
- E. Goitre

13. Which one of the following is the oldest treatment method employed to cure mental illness?

- A. Electroconvulsion
- B. Coma induction
- C. Trephination
- D. Lobotomy
- E. Rest cure

14. Durkheim is a name associated with the study of which of the following phenomena?

- A. Homicide
- B. Violence
- C. Truancy
- D. Arson
- E. Suicide

15. Which of the following is a correct match with respect to diagnostic scales in psychiatry?

- A. Negative symptoms: Jaspers
- B. Akathisia: Barnes
- C. Frontal battery: Folstein
- D. MMSE: Andreasen
- E. Formal thought disturbance: Hare

16. Which one of the following is regarded as an illustrative case for classical conditioning in phobia?

- A. Little Hans and horses
- B. Little Albert and rabbit
- C. Anna O
- D. Daniel Schreber
- E. Ratman

17 . Who among the following used the term agoraphobia to describe a category of anxiety disorder?

- A. Burton
- B. Schneider
- C. Westphal
- D. Jung
- E. Anna Freud

18. Freud is regarded as the father of psychoanalysis.Which one of the following techniques was developed by Freud for his own clinical practice?

- A. Narcoanalysis
- B. Polysomnography
- C. Free association
- D. Dissociation
- E. Mesmerism

19. Phrenology refers to the study of which of the following concepts?

- A. Study of free will
- B. Study of conscience
- C. Study of logic
- D. Study of skull contour
- E. Study of homunculus

20. Schizophrenia was coined by Bleuler in 1911.The literal meaning of the term schizophrenia is

- A. Split mind
- B. Split skull
- C. Fused mind
- D. Exploded will
- E. Split will

21. Which of the following refers to the literal meaning of the term hysteria?

- A. Wandering mind
- B. Wandering kidney
- C. Wandering uterus
- D. Wandering brain
- E. Wandering heart

22. Which of the following diagnostic technique involved injecting air into subarachnoid space?

- A. Myelography
- B. Pneumoencephalography
- C. Electroencephalography
- D. Encephalotomography
- E. Encephaloultrasonography

23. In a large, multicentre trial reported in 1988, Kane demonstrated that clozapine was superior in treatment-resistant schizophrenia patients compared to which of the following drugs?

- A. Haloperidol
- B. Chlorpromazine
- C. Olanzapine
- D. Fluphenazine
- E. Thoridazine

24. Who is the proponent of primal therapy?

- A. Arthur Janov
- B. Melanie Klein
- C. William Tuke
- D. Franz Alexander
- E. Mary Ainsworth

25. Which of the following described delusions as un-understandable?

- A. Jean Piaget
- B. Erik Erikson
- C. Karl Jaspers
- D. Eric Fromm
- E. Aaron Beck

26. Choose the best explanation for the term spirituality:

- A. Affiliation to a religious group
- B. Habitual practice of any religious activity
- C. Submission to existence of supreme powers, for example God
- D. Deeply held beliefs about the meaning of life
- E. Religious orientation without discrimination

27. The International Pilot Study on Schizophrenia concluded that global, cultural, and social differences exist in which one of the following characters of schizophrenia?

- A. Core symptoms
- B. Severity
- C. Outcome
- D. Dose of medications
- E. Gender distribution

28. Which one of the following psychopathologies is influenced more significantly by cultural differences than the others listed?

- A. Delusions
- B. Somatization
- C. Hallucinations
- D. Mania
- E. Obsessions

29. When using interpreters during psychiatric interview it is best NOT to

- A. Explain goals of the interview to the interpreter
- B. Rotate different interpreters with the same patient
- C. Provide debriefing to the interpreter after an emotional clinical encounter
- D. Enquire about the interpreter's country of origin or social position
- E. Encourage literal translation of the Mental State Examination

30. Clinical samples of patients with anorexia nervosa show a trend towards which of the following social categories?

- A. Upper social class
- B. Lower social class
- C. Immigrant population
- D. Poor literacy
- E. More elderly parents

31. Sick role includes all of the following EXCEPT

- A. Excuse from social responsibility
- B. Expectation to seek help
- C. Taking blame and responsibility for the illness
- D. Perception of disease as undesirable
- E. Attempts to restore previous state of health

32. Which one of the following is NOT a component of high expressed emotions?

- A. Warmth
- B. Over involvement
- C. Critical comments
- D. Enmeshment
- E. Hostility

33. High expressed emotions could be measured using which of the following instruments?

- A. Camberwell Assessment of Needs
- B. Camberwell Family Interview
- C. Simpson Angus Scale
- D. Quality of Life Scale
- E. Caregiver Burden Scale

34. Effects of high expressed emotions could be mitigated to some extent in which one of the following situations?

- A. The contact with family is less than 35 hours a week
- B. The family members are having mental health difficulties themselves
- C. The patient is married
- D. The patient has comorbid depression
- E. The patient has chronic rather than acute schizophrenia

35. Association between crime and mental illness is difficult to study. This is due to which of the following reasons?

- A. Most criminals are mentally ill
- B. Criminals are deceptive about mental illness
- C. Crime is over reported
- D. Captives are not representative of all criminals
- E. Mental illness is rarely independent of the crime committed

36. Stigma associated with mental illness could potentially be reduced by all of the following interventions EXCEPT

- A. Destigmatization campaigns
- B. Increasing community living of severely mentally ill people
- C. Educating the public about mental illness
- D. Legislation against social discrimination
- E. Improving broadcasting standards

37. Which of the following is NOT true with respect to stigma against mental illness?

- A. Stigma leads to social exclusion
- B. Stigma can prolong the duration of depression in a patient
- C. Stigma is seen even against mentally ill professionals
- D. Stigma has reduced substantially in the last two decades
- E. Stigma perceived by patients varies with their diagnosis

38. The term acculturation refers to which of the following?

- A. Adoption of beliefs and values of one cultural group by another
- B. Migration of civilizations in need of food and shelter
- C. Adoption of civilized social norms by a culturally weaker group
- D. Acceptance of rules and regulations of a mental health institute
- E. The tendency for a cultural group to enforce their values on another group

39. Koro is an anxiety state seen most commonly in which of the following geographical zone?

- A. Latin America
- B. South-east Asia
- C. India
- D. Alaskan natives
- E. Siberia

40. Which one of the following is a culture-bound syndrome characterized by an exaggerated startle reaction in middle-aged women?

- A. Piblokto
- B. Latah
- C. Brain fag
- D. Windigo
- E. Susto

41. In the UK, the annual prevalence of hallucinations is higher in which of the following racial groups?

- A. Asians
- B. Caribbeans
- C. Americans
- D. Whites
- E. Australian Jews

42. Which of the following is true regarding increased incidence of schizophrenia among migrant population?

- A. It depends on the country of origin
- B. It could be explained by drug use
- C. It is due to genetic factors
- D. It is generation limited
- E. It is strongly related to lower socioeconomic status

43. Which of the following theories holds that mental illness is a result of societal influence?

- A. Causation theory
- B. Drift theory
- C. Labelling theory
- D. Social disintegration theory
- E. Social agent theory

44. A patient with learning disability cannot understand the implications of hospitalization. But he does not resist being admitted to a hospital. Which of the following best describes his mental capacity status?

- A. Compliant and capable
- B. Compliant but not capable
- C. Non-compliant and incapable
- D. Non-compliant but capable
- E. None of the above

45. A patient decides to be on the waiting list for 12 months until she could see a psychotherapist. Choose an ethical principle relevant to this scenario:

- A. Confidentiality
- B. Distributive justice
- C. Therapeutic privilege
- D. Non-maleficence
- E. Autonomy

46. A test for capacity to make treatment decisions includes all of the following EXCEPT

- A. Ability to understand the choice
- B. Belief in the information given
- C. Ability to analyse benefits and harm
- D. Ability to retain information long enough to analyse them
- E. Ability to communicate a decision

47. Which is the most important ethical principle underlying informed consent?

- A. Beneficence
- B. Autonomy
- C. Non-maleficence
- D. Justice
- E. Paternalism

48. Over-riding patient confidentiality cannot be substantiated reasonably if it is carried out under which of the following situations?

- A. Grave danger to a third party
- B. Disclosure of information is required by law
- C. Child protection involved
- D. Under court order
- E. Following the Death of the patient

49. Which of the following cannot be considered as an exception to direct informed consent?

- A. Waiver
- B. Detention under mental health act
- C. Emergencies where full information cannot be given
- D. Incompetent patient
- E. Passively compliant patient

50. In ethology, imprinting refers to which of the following processes?

- A. Learning modified by consequences
- B. Learning independent of developmental age
- C. Slow learning of parental behaviours
- D. Learning neonatal reflexes in human beings
- E. None of the above

51. If a patient reveals murderous intentions against his wife, a psychiatrist is duty bound to inform both police and the wife. This principle is derived from which of the following medicolegal illustrations?

- A. Tarasoff's case
- B. Bournewood case
- C. McNaughten's case
- D. Gillick's case
- E. Shipman's case

52. Which of the following best describes the difference between the terms handicap and impairment?

- A. Handicap refers to loss of social role
- B. Impairment refers to loss of social role
- C. Handicap refers to a structural defect
- D. Impairment refers to inability to perform a complex task
- E. Handicap refers to irreversible loss

53. Fathers of schizophrenia patients originate from higher social class than the patients themselves. This exemplifies which of the following theories?

- A. Social causation
- B. Social disintegration
- C. Social drift
- D. Social labelling
- E. Social construction

54. The Helsinki declaration is applicable in which of the following scenarios?

- A. A 24-year-old man is comatose and needs blood transfusion
- B. A 13-year-old girl asks for contraception
- C. A Jehovah's witness refuses blood transfusion for his 5-year-old child
- D. A 34-year-old man volunteers for a neuroimaging study
- E. A 94-year-old lady refuses to move to a nursing home

55. Which one of the following occupations carries a high risk of eating disorders?

- A. Modelling
- B. Law
- C. Nursing
- D. Marketing
- E. Teaching

56. Under the principle of common law which of the following can be done without a patient's consent?

- A. Blood sample can be drawn after paracetamol overdose in an emergency
- B. Liver transplantation can be done on a suicidal patient
- C. A psychiatric inpatient can be detained overnight if they attempt to leave
- D. Contraceptives can be implanted to a young lady with mania
- E. Depot antipsychotics could be given for agitation

57. 'Run amok' involves sudden dissociative reaction which can lead to multiple homicide or suicide. It is best classified under which of the following categories?

- A. Dissociation reaction
- B. Somatoform disorders
- C. Culture-bound syndrome
- D. Substance use disorder
- E. Delusional disorder

58. Who first used the word 'psychiatry' (or 'psychiatrie') to describe the profession?

- A. Reil
- B. Rush
- C. Deniker
- D. Kline
- E. Charcot

59. One of the following is a major proponent of the antipsychiatry movement?

- A. William Osler
- B. Thomas Szasz
- C. Aubrey Lewis
- D. Henry Maudsley
- E. Adolf Meyer

60. Which of the following is NOT routinely considered as boundary violations in a therapeutic relationship?

- A. Touching except handshake
- B. Treating friends or relatives
- C. Personal disclosure
- D. Interpretation of emotionally neutral statements
- E. Colluding with a patient against a third party

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1. B. Phillippe Pinel (1745–1826) was working at Salpetriere in Paris at the time of the French Revolution. He insisted on releasing patients from chains in asylums, emphasized systematic clinical observations using case records and championed humane treatment of the mentally ill. Anton Mesmer was a proponent of mesmerism, a form of clinical suggestion. Jacques Lacan is known as the 'French Freud'. Melanie Klein was an object relations theorist.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 17.

2. C. Degeneration theory maintained that most forms of insanity resulted from continuous deterioration of mental faculties. More alarmingly, it also stated that hereditary transmission of nervous dysfunction was produced by noxious environmental factors. Morel was the proponent of degeneration theory.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p.19.

3.A. American neurologist, Beard, described neurasthenia in 1880. This is retained in the ICD-10, and is the closest diagnosis to the present day chronic fatigue syndrome. Various terms, including myalgic encephalomyelitis and viral fatigue syndrome, are in vogue in an attempt to emphasize infectious/ inflammatory origin of this illness.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 21.

4. D. General paresis or paralysis of the insane (GPI, also called as paralytic dementia) is a rare encephalitic illness. GPI was common in the past due to syphilis. Malaria therapy for GPI was proposed by Wagner von Jauregg, a Nobel laureate. Manic presentation was common in GPI. GPI has almost disappeared now, though with the rising HIV pandemic it is speculated to have resurgence in the future.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 21.

5. D. Insulin coma therapy for severe mental illness was introduced by Sakel in 1933. This was a potentially fatal treatment complicated by seizures and encephalopathy. Chemically induced seizures were also employed around the same period (von Meduna) for treating schizophrenia.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 21.

6. D. Hecker described hebephrenia – characterized by adolescent onset with disorganized behaviour and incongruent affect. Hecker was a pupil of Karl Kahlbaum, and some consider that he only popularized the notion of hebephrenic schizophrenia, which was originally proposed by Kahlbaum. Sir Thomas Clouston is associated with 'developmental insanity'. William Tuke opened the Retreat in York, promoting moral treatment and unchaining the insane. Falret and Baillarger are associated with folie circulaire (manic depression) while Greisinger developed views on the neuropathological basis for psychiatric disorders.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 3.

7.B. Monomania was described by Esquirol and it is similar to the present day concept of delusional disorder. Nymphomania was coined in 1775, by a French doctor Bienville, from Greek *nymphē* meaning 'bride'. It was used to describe excessive sexual desire seen in some women. The term hypomania was coined by Mendel (1881).

Bynum B. Monomania. *Lancet* 2003; **362**: 1425.

Angst J, et al. Toward a re-definition of subthreshold bipolarity: epidemiology and proposed criteria for bipolar-II, minor bipolar disorders and hypomania. *Journal of Affective Disorders* 2003; **73**, 133–146.

8.A. Kurt Schneider proposed first-rank symptoms – neither diagnostic nor prognostic but only indicative of schizophrenia. Eugen Bleuler used the term schizophrenia in 1911. Carl Schneider classified many forms of formal thought disturbances; later he was closely associated with the Nazi movement in Germany, promoting 'euthanasia' for mentally retarded and epileptic patients.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 568.

9.D. Moreno described psychodrama, not chorea. He also introduced sociometry. Anhedonia stands for inability to obtain pleasure from activities; alexithymia is a difficulty in verbalizing emotional states; Cyclothymia, retained in ICD-10, is a minor subsyndromal form of bipolar illness described by Kahlbaum; Cameron described overinclusion as a part of formal thought disturbances.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1446.

10.B. Monoamine oxidase inhibitors were the earliest antidepressants. They were serendipitously discovered when iproniazid, an antitubercular antibiotic, was found to have mood-lifting properties. This was reported by Bloch in 1954.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1293.

11.D. Phineas Gage was a railway workman whose frontal lobe (especially the ventromedial prefrontal area) was accidentally drilled out by an iron bar. He survived the terrible accident but had significant personality and behavioural change, stimulating interest in studying functions of the frontal lobe.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 133.

12.A. Lithium was brought to the attention of psychiatric practice in 1949 by Australian, John Cade, who highlighted its mood-stabilizing effect. Lithium water was a popular 'tonic for aches and pains' and was used for gout before this discovery.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 256.

13.C. Trephination refers to drilling holes in skulls to release evil spirit that were believed to haunt the insane. This practice is noted even in prehistoric skulls dated 6500 BC. Electroconvulsions was introduced by Cerletti and Bini in the early part of the twentieth century, while Moniz proposed neurosurgical methods to treat psychiatric disorders.

Rutkow IM. Moments in surgical history – trephination: how did they do it? *Archives of Surgery* 2000; **135**: 1119.

14. E. Durkheim described anomie, altruistic, and egoistic suicide. In anomie, the patient feels let down by society and fails to follow norms. In altruistic suicide, over involvement with a particular social group leads to significant alteration in one's self identity and the suicide is for the group cause rather than personal cause, for example hara-kiri of a soldier. Egoistic suicide refers to those suicides in people who are not strongly integrated into any social group, for example lack of family integration in unmarried persons.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 900.

15. B. Barnes' Akathisia Rating Scale is used to measure akathisia, a side-effect of antipsychotics characterized by both subjective and, later, objective restlessness. Folstein described MMSE in a seminal paper; Andreasen devised the Thought Language and Communication scale to measure formal thought disturbance; Kay's PANSS (positive and negative symptom scale) can measure negative symptoms; Hare is a name associated with a psychopathy checklist used by forensic services. Barnes TRE. The Barnes akathisia rating scale – revisited. *Journal of Psychopharmacology* 2003; **17**: 365–370.

16. B. Little Albert learnt to avoid rabbits after a loud noise induced fear in him whenever he played with a white rat. This fear later generalized to white rabbits (Watson and Rayner 1920). Anna O was a patient with 'hysteria' treated by Freud and Breuer. Ratman was also a patient of Freud who had OCD, while Schreber had delusional disorder.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 142.

Watson JB, Rayner R. Conditioned emotional reactions. *Journal of Experimental Psychology* 1920; **3**: 1–14.

17. C. Robert Burton wrote 'The Anatomy of Melancholy' in which some description of symptoms suggestive of agoraphobia is seen together with the account of depressive illness. In 1871, Carl Otto Westphal coined the term agoraphobia to describe several of his patients who experienced severe anxiety when walking through streets or open squares. Schneider proposed first-rank symptoms; Jung belonged to the psychoanalytic school. Anna Freud, Freud's daughter, was involved in classifying defence mechanisms and also in child psychoanalysis.

Callard F. 'The sensation of infinite vastness'; or, the emergence of agoraphobia in the late 19th century. *Environment and Planning: Society and Space* 2006; **24**: 873–889.

18. C. Free association was a popular technique used by Freudian analysts. Having learnt hypnosis from Charcot, neurologist-turned-psychoanalyst Freud developed the method of free association in which patients were encouraged to speak about their thoughts without distraction or censure. This was intended to be a therapeutic method, though later adapted largely as an interview technique. Narcoanalysis involves using barbiturates as truth serum. Dissociation is a psychological mechanism and not a clinical technique. Mesmerism or animal magnetism was developed by Anton Mesmer.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 5.

19. D. Phrenology was a popular theory which claimed to determine personality and diagnose/predict mental symptoms using the shape of the skull. It was developed by the German physician Gall and was very popular in the mid 1800s. Phrenologists used their bare hands and palms to feel for fissures or dents in their patients' skulls. With this information, the phrenologist would report on the character of the patient; its popularity reached extremes when marriages and recruitment were advised by phrenologists.

Simpson D. Phrenology and the neurosciences: contributions of F. J. Gall and J. G. Spurzheim. *Australia and New Zealand Journal of Surgery* 2005; **75**: 475.

20.A. The term 'schizophrenia' stands for split personality. Even today this is confused with more dramatic multiple personality disorder by some of the lay public. The term was coined by Eugene Bleuler in 1911. It is derived from the Greek words 'schizo' (split) and 'phrene' (mind). Bleuler intended to use the name in order to capture the functional dissociation between personality, thinking, memory, and perception in a patient with schizophrenia.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 568.

21.C. The term hysteria stands for 'wandering uterus'. It was incorrectly observed that hysteria affects only women. The uterus is a major morphological difference between a man and a woman; hence, rather simplistically, it was believed that uterus was the site of problems in hysteria. Also it was believed that unmarried women often had this wandering uterus that could be tied down by wedlock, leading to a reduction in hysterical symptoms following marriage. It was even believed in a Greek myth that this wandering uterus could strangulate a person, leading to hysterical globus or aphonia! Unusual treatments, including pelvic massage to induce orgasm, were offered to cure hysteria later in history.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 634.

22.B. Dandy, in 1919, used pneumoencephalogram as a diagnostic technique to visualize the brain. This technique showed enlarged ventricles in patients with schizophrenia, which was later confirmed by investigations using various other imaging modalities that developed later. There was a high fatality rate associated with pneumoencephalogram.

Semrad EV and Finley KH. A note on the pneumoencephalogram and electroencephalogram findings in chronic mental patients. *Psychiatric Quarterly* 1963; **17**: 76–80.

23.B. Kane revived the use of clozapine through his milestone study. He compared chlorpromazine and clozapine in a treatment-resistant sample and demonstrated clozapine's superiority in this instance (in 1988) leading to FDA approval (in 1989). The multicentre trial showed that 30% of clozapine-treated patients will respond in 6 weeks while 60% will respond in 6 months. On the other hand, only 4% improved on chlorpromazine in combination with benztropine.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 262.

24.A. Primal therapy refers to a trauma-focused treatment proposed by Arthur Janov. Primal therapy claims that only through direct experience of pain and emotions, could any psychological treatment work. Other talking therapies use higher cortical cognitive processes to talk about emotional experience while primal therapy attempts to engage lower brain centres during psychotherapy.

Janov A. Towards a new consciousness. *Journal of Psychosomatic Research* 1977; **21**: 333–339.

25.C. Jaspers was both a psychiatrist and a philosopher. He studied psychopathology in depth; the descriptive psychopathology and psychiatric phenomenology used in current psychiatric practice are largely Jasper's contributions. According to him, a specific quality of delusions is their 'un-understandability'. This distinguished primary delusions from delusion-like ideas or secondary delusions that arose out of a different psychopathology, for example hallucinations.

Jones H et al. Jaspers was right after all – delusions are distinct from normal beliefs. *British Journal of Psychiatry* 2003; **183**: 285–286.

see also

Owen G et al. Jaspers' concept of primary delusion. *British Journal of Psychiatry* 2004; **185**: 77–78.

26. D. Contrary to widely held belief, spirituality is not defined as affiliation to religious practice or accepting God. It rather refers to deeply held beliefs about the meaning of one's life.

Kay J and Tasman A, eds. *Essentials of Psychiatry*. Wiley, 2006, p. 23.

27. C. The IPSS (International Pilot Study on Schizophrenia) was a global, multicentre study carried out by the WHO. The main finding was a strikingly similar core symptom profile irrespective of cultural differences and more or less similar life-time morbid risk (though this has been disputed; See McGrath NAPE lecture 2004). Surprisingly, outcome of schizophrenia was better in the developing, rather than the developed countries.

McGrath JJ. The surprisingly rich contours of schizophrenia epidemiology. *Archives of General Psychiatry* 2007; **64**: 14–16.

McGrath JJ. Myths and plain truths about schizophrenia epidemiology – the NAPE lecture 2004. *Acta Psychiatrica Scandinavica* 2005; **111**: 4–11.

28. B. Somatization is consistently found to be higher among South Asian populations, especially in females. Linguistic differences could explain an apparent inability to verbalize emotions, leading to requests for medical interventions for physical symptoms. Cultural sensitivity is essential to detect undiagnosed depression in different ethnic groups.

Bhui K and Hotopf M. Somatization disorder. *British Journal of Hospital Medicine* 1997; **58**: 145–149.

29. B. Using different interpreters for different sessions of clinical encounter with the same patient will lead to confusion and needless anxiety due to the presence of a new person during each doctor-patient meeting. It is advisable to stick to the same interpreter when dealing with a particular patient. Knowing the interpreter's social and ethnic background might help in utilizing the interpretation better. Also, the Mental State Examination can be misinterpreted by a lay person – it is often necessary to instruct the interpreter to translate certain parts of the clinical interview verbatim.

Kay J and Tasman A, eds. *Essentials of Psychiatry*. Wiley, 2006, p. 27.

30. A. An unequal distribution of social class is noted in anorexia. Higher representation from upper classes of society, good literacy rates, and higher frequency of non-immigrant populations is noted among clinical samples of anorexia patients. This strengthens the aspect of culture specificity of anorexia nervosa.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 836

31. C. Sick role, as defined by Parsons, excludes patient from taking all responsibility for becoming ill. It is perceived that illness is unavoidable and any ill person must seek help, as illness is undesirable and an attempt must be made to restore the previous state of health. Until this happens the person is relieved of certain social responsibilities. This social perception of illness drives a person to occupy what is collectively termed as the sick role.

Kay and Tasman A, eds. *Essentials of Psychiatry*. Wiley, 2006, p. 679.

32. D. Enmeshment has not been discussed as a component of expressed emotions (EE). Enmeshment stands for deranged family dynamics, characterized by blurring of normal hierarchy and intergenerational boundaries in a family. Enmeshment is linked to various child psychiatry problems, including eating disorders. EE is characterized by warmth, hostility, and critical comments and emotional over-involvement. High EE is implicated in relapse of various psychiatric illnesses, especially schizophrenia. It is also demonstrated that being on long-term antipsychotics can alleviate the relapse-provoking effect of a high EE environment to some extent. Vaughn and Leff studied EE in depth.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 603.

Leff J and Vaughn C. *Expressed Emotion in Families*. New York: Guilford Press, 1985.

33. B. The Camberwell Assessment of Needs scale, also called as CAN, was developed by the Section of Community Psychiatry (PRiSM) at the Institute of Psychiatry. It is a tool for assessing the needs of people with severe and enduring mental illness, including both health and social needs. It has clinical and research versions, and also a shorter version for routine use. The Camberwell Family Interview is a different scale from CAN, and assesses the feelings and experiences of relatives with regard to a patient's admission to hospital. In the Camberwell Family Interview, three measures of EE – criticism, hostility, and emotional over-involvement – are assessed.

Leff J and Vaughn C. *Expressed Emotion in Families*. Guilford Press, New York, 1985.

34. A. It has been shown that the effect of high expressed emotions on relapse of psychotic episodes is lesser if contact with family members lasts less than 35 hours a week. This dose-response relationship adds strength to the role of the family's emotional expression on the course of schizophrenia. The degree of EE can be higher if any of the family members has mental health difficulties themselves.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 404.

35. D. It is widely acknowledged that captives may not be the ideal, representative sample of everyone who indulges in criminal activity. Captives may be a special population with lower than normal skills to escape or avoid a sentence or arrest. Often the IQ of captured criminals may be lower than the IQ of non-captured criminals, on average. So studying captives for the rate of mental illness or effect on crime secondary to treating mental illness could not be generalized to wider social criminalities. Most criminals are mentally sound. Crime is under-reported rather over reported, on the whole.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 703.

36. B. Various measures to combat stigma has shown only modest benefits over the century. Destigmatization campaigns, public education, and vigilant media policy can be helpful. It is clear that in the past few decades, the closure of asylums and psychiatric hospitals has increased community living of patients with mental health problems. But this has not translated into lower rates of stigma and discrimination – if anything this has got worse, assuming different forms.

Byrne P. Stigma of mental illness and ways of diminishing it. *Advances in Psychiatric Treatment* 2000; **6**: 65–72.

37. D. Stigma has not reduced in anyway over last two decades in spite of improved literacy rates. The perceived stigma is more generic for mental illness and does vary with the diagnosis to some extent. Stigma leads to delayed help seeking and social exclusion, making outcome worse.

Byrne P. Stigma of mental illness and ways of diminishing it. *Advances in Psychiatric Treatment* 2000; **6**: 65–72.

38. A. Acculturation is a social-anthropological phenomenon which refers to the adoption of cultural practices of one group by another due to the effect of living close to each other. It does not refer to being civilized or non-civilized in cultural practice. The tendency for a cultural group to enforce their values on another group is called assimilation. Acceptance of rules and regulations of a mental health institute is related to the process of institutionalization, described by Goffman.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 168.

Goffman E. *Asylums. Essays on the social situation of mental patients and other inmates*. Harmondsworth: Penguin, 1961.

39. B. Koro is a culture-bound syndrome that is most often seen as genital retraction anxiety rather than delusional state. It usually affects young males, and is accompanied by anxiety that genitals are shrinking. It is an acute condition with favourable prognosis compared to chronic psychotic illnesses. It is often reported in Malaysia, Taiwan, Philippines, and other parts of south-east Asia. It is referred to as Shook Yang in Japan. Koro literally means head of a turtle (which retracts). Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1062.

40. B. Latah is a culture-bound syndrome seen mainly in women in south-east Asia. It is characterized by severe startle response together with loss of control over behaviour, echolalia, and echopraxia. Such patients are noted to obey any commands issued to them.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1063.

41. B. The prevalence of 'all cause' hallucinations are higher in the Caribbean population living in the UK compared to other ethnic groups. It is noted to be 2.5 times more common in this group. South Asian migrants come next in the list, followed by native White populations. Cultural differences exist not only in disease prevalence but also in non-clinical but abnormal mental experiences measured in community samples.

Johns LC, Nazroo JY, et al. Occurrence of hallucinatory experiences in a community sample and ethnic variations. *British Journal of Psychiatry* 2002; **180**: 174–178.

42. E. It is now accepted that immigration is a clear risk factor for developing schizophrenia, irrespective of the prevalence rates in the country of origin, genetic loading, or cannabis use. This effect is not limited to the generation that migrates – it extends to the second generation immigrants as demonstrated in the AESOP Study in the UK. It has also been shown that in neighbourhoods where minority status is significant due to the high population of majority ethnic group in the locality and poor socioeconomic status of immigrants, incidence of schizophrenia is increased. This applies to any minority group irrespective of racial status.

Cooper B. Immigration and schizophrenia: The social causation hypothesis revisited. *British Journal of Psychiatry* 2005; **186**: 361–363.

43. C. Labelling theory was applied to explain mental illness in 1966 by Thomas Scheff. He claimed that mental illness is manifested solely as a result of societal influence. The society views certain actions as deviant. A label of mental illness is placed on those who exhibit deviant behaviours in order to explain these behaviours. The expectations then placed on these individuals unconsciously change their behaviour – giving them the role of mentally ill. Social causation and drift theories attempt to explain the association between lower socioeconomic status and mental illness. Social causation theory proposes that low socioeconomic status breeds mental illnesses. Social drift theory takes the view that a decline in social status occurs following development of mental illnesses.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 123.

44. B. Often patients who lack capacity to make treatment decisions agree to follow a treatment plan passively. This special group is termed 'compliant not capable'. Learning disability services, dementia care, and geriatric care often face challenge with such patients. The Bournewood case refers to a patient with autism who was kept in hospital against the wishes of his carers as he complied with hospital admission. Though he did not have capacity to decide on his treatment he was not detained under the mental health act as he was compliant to stay at the hospital. This case revealed a wide gap in English mental health law.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 36.

45. B. Justice is one of four primary ethical principles. Justice is the moral obligation to act on the basis of fair judgement between competing claims. Justice is classified into: (1) fair distribution of scarce resources (distributive justice); (2) respect for people's rights (rights based justice); and (3) respect for morally acceptable laws (legal justice). In health ethics, distributive justice means equity for all where 'equals are equally treated'; it concerns economic distribution and health-care resource allocation.

Gillon R. Medical ethics: four principles plus attention to scope. *British Medical Journal* 1994; **309**: 184–8.

46. B. Capacity by definition is a legal concept; it refers to the ability to enter into valid contracts. Every adult is presumed to have capacity unless proved otherwise. Capacity is also task specific; one can have capacity to decide on treatment but can lack capacity to dispose of an estate. A test for capacity includes: (1) able to understand the nature of a decision that needs to be made; (2) able to weigh risks and benefits of any decision; (3) able to retain information long enough to make a decision; and (4) able to communicate the decision clearly. It is not necessary for the patient to believe in the information given to him.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 736.

47. B. For an informed consent to be valid, as a general rule, five areas of information must be provided: (1) description of the medical condition or problem; (2) nature and purpose of the proposed treatment; (3) risks and benefits of the proposed treatment; (4) viable alternatives to the proposed treatment; and (5) prognosis with and without treatment. The most important ethical principle preserved by obtaining informed consent is that of patient autonomy.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 1372.

48. E. Personal information should not be disclosed to a third party without the patient's express consent, except when: (1) serious risk to third parties outweighs the interests on patient's privacy, for example child abuse; (2) disclosure of information is required by law, for example a notifiable disease; and (3) patient explicitly agrees to disclosure to a third party. Death of a patient does not waive one's responsibility to maintain confidentiality.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 1387.

49. E. When a person is passively compliant it is necessary to consider absence of informed consent. This is often seen when patients are prescribed ECT – without knowing all required information, they will agree for a course of treatment passively as the doctor has prescribed it. Legal privilege is the right to maintain secrecy or confidentiality when summoned by court. The right of legal privilege belongs to the patient. Therapeutic privilege is different from this legal privilege. Therapeutic privilege is used when a psychiatrist withholds information in the belief that giving a patient all of the information would harm the patient. This is not commonly practised. While detaining a patient under the mental health act, often there is no consent from the patient for hospitalization. But this is commonly done against patient's approval on the grounds of safety of the patient and the others. An incompetent person is one who is incapable of giving informed consent; in which case, consent can be granted only by that person's guardian, or other persons with legal authority to give consent (e.g. a lasting power of attorney for health-care issues). Consent is presumed when a person is suffering from an emergent situation that requires treatment but is unable to give consent. Waiver is a situation where a patient asks the therapist not to give him a particular part of health information as that would be detrimental for him to know it. Again, this is rarely used.

Kay J and Tasman A, eds. *Essentials of Psychiatry*. Wiley, 2006, p. 88.

50. E. Ethology refers to the biological study of animal behaviour. Imprinting is a specialized form of learning which occurs early in life (critical phase). The exposure to the stimulus situation must occur during the critical period, and the exposure can be of short duration without any reinforcement. This type of learning is particularly resistant to change. It has not been clearly demonstrated in human infants so far.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 160.

51. A. Two months before killing his exgirlfriend Tarasoff, Poddar had declared his intentions to his psychotherapist. The psychotherapist tried to have Poddar detained but he was soon released. Police were informed of the risk, but the court ruled that apart from a duty of care to the patient, and duty to protect by informing the police, there is a duty to warn the third party directly. This is called the Tarasoff ruling.

Sadock BJ and Sadock VA. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 1374.

52. A. Impairment (I) is defined as any loss or abnormality of a bodily structure or function. Disability (D) is the restriction to perform an activity in a normal manner due to the impairment. The social disadvantage for a given individual in terms of role fulfilment resulting from the disability is called handicap (H) (I leads to D; D leads to H). Reversibility of loss is not considered as a discriminating feature in defining handicap.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 688.

53. C. Goldberg conducted a survey of a national sample of males aged 25–34 on their first admission to a mental hospital in England and Wales for schizophrenia. This showed an expected excess of patients in lower social class v Lower economic class was seen as a cause for schizophrenia (social causation). But when the social class distribution of the fathers at the time of the patients' birth was studied, it transpired to be very similar to that of the general population. This is explained by the hypothesis that schizophrenia results in a downward drift of socioeconomic status rather than poverty being a cause for schizophrenia. (This social drift hypothesis was first suggested by the Chicago study of Faris and Dunham, 1922–1934).

Goldberg EM and Morrison SL. Schizophrenia and social class. *British Journal of Psychiatry* 1963; **109**: 785–802.

54. D. The Helsinki declaration is associated with research ethics. The efforts to streamline ethical principles of conducting research on human subjects started following the Second World War. Gillick competence refers to the assessment of ability of a child (16 years or younger) to consent to his or her own medical treatment, without the need for parental permission.

Goodyear MDE, et al. The Declaration of Helsinki. *British Medical Journal* 2007; **335**: 624–625.

55. A. Ballet dancers and models have a high prevalence of anorexia nervosa as a result of pressures to sustain a slim figure consistent with their professional requirements.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 836.

56. A. Common law principle of necessity allows medical interventions only if they are life saving, emergency measures. Irreversible procedures such as transplantation cannot be carried out. It is not good practice to administer depot under 'emergency' situations. Psychiatric detention must follow Mental Health Act principles whenever required.

Hewson B. The law on managing patients who harm themselves and deliberately refuse treatment. *British Medical Journal* 1999; **319**: 905–907.

57. C. Running amok (derived from Malay word *amuk*, meaning ‘mad with anger’) is a Malaysian culture bound syndrome. It usually affects a young male who will develop a sudden frenzy and acquire a weapon in an attempt to kill or injure anyone indiscriminately. Amok episodes can lead to serious violence or suicide.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1063.

58. A. Johann Christian Reil coined the term psychiatry to describe the practice of psychological medicine. He was a German doctor and used the word ‘Psychiatrie’ in 1808.

Semple DM et al., eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press, 2005, p. 20.

59. B. Thomas Szasz has expressed strong views against the current conceptual models of disease in psychiatry. Antipsychiatry refers to a heterogeneous school that challenges the fundamental theories and practices of psychiatry. Aubrey Lewis was an English psychiatrist associated with the Maudsley Hospital. Adolf Meyer proposed psychobiology.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 4 Table 1.2.

60. D. Interpretation is an interview technique and not a boundary violation. It is increasingly realized that subtle violations of doctor–patient boundaries often occur in psychiatric setting. Boundary crossing is defined as intentional or unintentional incursions occurring during a therapeutic relationship. When such boundary crossings produce harm to the patient, then they are called boundary violations. This can be both sexual and non-sexual violation.

Kay J and Tasman A, eds. *Essentials of Psychiatry*. Wiley, 2006, p. 65, Table 5.5.

INDEX

Key: ■ denotes question, ■ denotes answer

- abandonment, fear of **53, 74**
absence seizures **36, 78**
abused children **130**
acamprostate **159**
acculturation **142, 177, 188**
ACE inhibitors **164**
actor–observer bias **138**
acute intermittent porphyria (AIP) **33**
adherence with treatment **148, 160**
Adler, Alfred **114, 127, 128**
affect
 congruence **26**
 labile **26**
 and mood, difference between **11, 26**
 reactivity **26**
 stability **26**
affect illusions **96**
affect trauma theory **127**
affective disorders **49, 69**
after the exam **5–6**
afterimages **98**
age disorientation **91, 108**
ageing
 dementia **62**
 WAIS subtests **116, 132**
aggression
 deindividuation **143**
 frustration–aggression hypothesis **142**
agonists **159**
agoraphobia **27, 185**
agranulocytosis **169**
 clozapine-induced **18, 34, 164**
agraphia **110**
Ainsworth, Mary **115, 130**
akathisia **92, 108**
 antipsychotic side-effect **163**
 Barnes' Akathisia Rating Scale **185**
alcohol hangover **96**
alcohol intoxication **98**
alcohol withdrawal **81, 98**
alcoholic hallucinosis **97**
alcoholism and alcohol misuse
 dementia **62**
 hallucinations **65**
 heritability **70**
 morbid jealousy **102**
 narrowed repertoire of drinking **65**
 physical complications **16, 31**
 screening **10, 25**
 self neglect **25**
 Wernicke–Korsakoff syndrome **64**
alexia (pure word blindness) **31, 104, 110**
alexithymia **106, 184**
allogia **103**
alopecia **33**
alopecia areata **33**
alpha 2 agonists **159**
alprazolam **159**
altruism **130, 143**
altruistic suicide **185**
Alzheimer's disease (AD)
 diagnosis **21, 37**
 differentiation from Lewy body dementia **20, 36**
 genetics **42, 63**
 NSAIDs **62**
 presenile dementia **62**
 smoking **62**
ambidexterity **95, 108**
amisulpiride **162, 167**
amitriptyline **32, 152, 165, 170**
amnesia **110, 166**
amoxapine **165, 168**
amyloid precursor protein (APP) **63**
amyotrophic lateral sclerosis **36**
anaclitic depression **130**
anankastic personality **53, 74**
anaphylactic reactions **164**
Andreasen **185**
angular gyrus lesions **31**
anhedonia **92, 109, 184**
Annual Review of Competence
 Progression (ARCP) **1**
anomic aphasia **30**
anomic suicide **185**
anonymity **124, 143**
anorexia nervosa
 lanugo hair **17, 33**
 natural history **54, 76**

- anorexia nervosa (*Cont.*)
 occupational risk factors 180, 191
 social factors 176, 187
- anosognosia 105, 110
- antagonists 159
- anticipation, as defence mechanism 130
- anticonvulsants, perinatal period 165
- antidepressants
 discontinuation reaction 170
 discovery 172, 184
 hyponatremia 160
 trials 116, 132
- antipsychiatry movement 181, 192
- antipsychotics
 ECG abnormalities 35
 hepatic impairment 154, 167
 metabolic side-effects, predictors of 20, 35
 parkinsonian side-effects 164
 perinatal period 165
 side-effects 151, 160, 163
 weight gain 154, 167
- antisocial personality disorder 73
- anxiety
 HADS 133
 koro 177, 189
- aphasia 30
- APOE4 allele 63
- apraxia 30
- Argyll Robertson pupil (ARP) 14, 29
- ariPIPrazole 147, 159, 163, 167
- Asch 142
- ash-leaf lesions 16, 32
- astasia-abasia 29, 90, 107, 108
- astereognosis 110
- asyndesis 87, 103
- attachment theory 115, 130, 141
- attribution bias 107
- attributions 138, 139
- atypical depression 48, 69
- auditory comprehension and repetition, isolated loss of 15, 30
- auditory hallucinations 81, 93, 97, 110
- autism 111, 189
- autistic thinking 103
- autochthonous delusions 102
- autonomy 190
- autoscopy 82, 98, 106
- aversive conditioning 135
- avoidance learning 136
- avoidant personality disorder 73, 74
- backward conditioning 136
- Baddeley 144
- Baillarger 183
- Bandura 137
- Bannister repertory grids 88, 105
- Barnes' Akathisia Rating Scale 108, 163, 185
- Bazett's formula 168
- Beard 183
- Beck, Aaron T. 137
- Beck Depression Inventory (BDI) 132
- bedside cognitive tests 116, 132
- behavioural inhibition 72
- benzodiazepines
 overdose 161
 perinatal period 165
 withdrawal 98
- Bienville 184
- bilateral facial nerve palsy 17, 32
- Bini 184
- bipolar illness 26
 Falret and Baillarger 183
 features 48, 69
 gender factors 69
 genetic factors 70
 heritability estimate 48, 69
 hypothyroidism 47, 68
 lamotrigine 169
 lithium 17, 19, 33, 34
 mania without depression 48, 69
 natural course 67
 personality disorder associated with 53, 74
 postpartum psychosis 59
 and schizophrenia, differentiation between 49, 69
- birth order theory 128
- Bleuler, Eugene 24, 174, 184, 186
- Bloch 184
- blocking 95
- blood injury injection phobia 71
- body image disturbance 82, 98
- books, recommended 3, 6
- borderline personality disorder 53, 73, 74
- bottom-up processing of perception 138
- boundary violations, therapeutic relationship 181, 192
- Bournewood case 189
- boxing 62
- breastfeeding 165
- Breuer 185
- Brief Psychiatric Rating Scale (BPRS) 132, 133, 134
- Broca's aphasia 30, 110
- Brown-Sequard syndrome 31
- bulbar palsy 29
- bulimia nervosa 27, 54, 76
- bupropion 159
- Burton, Robert 185
- buspirone 150, 159, 163
- butyrophosphonates 149, 162
- bystander apathy/bystander effect 143
- Cade, John 184
- CAGE questionnaire 25

- Camberwell Assessment of Needs scale (CAN) 188
Camberwell Family Interview 188
Cambridge Contextual Reading Test 131
Cameron 184
cannabis use 46, 67
Cannon–Bard theory of emotions 133
capacity 179, 190
Capgras syndrome 102
carbamazepine 159, 160, 161, 164, 169
cardiac arrhythmia 166
cardiovascular illness 155, 168
Carroll Rating Scale for Depression 134
case studies 173, 184
caseness, psychiatric 28
cataphasia 109
catastrophic reaction 110
catatonia 92, 108
catatonic mutism 90, 107
catatonic rigidity, differentiation from neurological spasticity 92, 108
categorical classification 41, 61
category test 132
causation theory 189, 191
cenesthesia 110
centration 141
Centre for Epidemiologic Studies Depression Scale (CES-D) 134
cerebellar dysarthria 29
cerebellar dysfunction 29
cerebellar lesions 29
Cerletti 184
change, stages of 125, 143
Charcot 185
Charles Bonnet syndrome 98
cheese reaction 169
Chess 130
child psychoanalysis 185
chlorpromazine 162, 186
cholinesterase inhibitors 150, 163
chorea, acute onset of 13, 28
chronic fatigue syndrome 55, 77, 183
chunking 144
circumstantiality 88, 104
citalopram 170
clanging 100, 103
classical conditioning 118, 119, 134, 135, 136
illustrative case 174, 185
claustrophobia 37
clinical psychiatry, core 39–78
clinical skills 7–37
clomethiazole 166, 167
clonazepam 168
clonus 36
closed questions 9, 23, 25
Clouston, Sir Thomas 183
clozapine 162, 163
action 167
Kane 175, 186
leucopenia 169
plasma levels 151, 164
side-effects 150, 160, 162, 164
tardive dyskinesia management 168
weight gain 167
clozapine-induced agranulocytosis 18, 34, 164
Clozaril patient monitoring service (CPMS) 34
cloze procedure 105
cluster headache 16, 29, 32
cocaine 98, 159
cognitive dissonance 139
cognitive therapy 137
cohesion analysis 105
collectivism 138
collusion 25
coma therapy 172, 183
common law principle of necessity 181, 191
common sense psychology 138
completion illusion 96
compliant not capable patients 189
compressive optic neuropathy 31
compulsive skin picking 102
computed tomography (CT) 19, 34, 35
conceptual apraxia 30
conceptual thinking 103
concrete operational stage of development 131
concrete thinking 104
concurrent validity of a test 133
condensation 114, 128
conditioned response 136
conduct disorder 70
conduction aphasia 31, 111
confabulation 111
confidentiality, over-riding 179, 190
conformity 142
confrontation 24, 25
congruence of affect 26
consensus statements 61
construct validity of a test 133
contact comfort 141
content of thought 99
content validity of a test 133
continuous reinforcement schedules 137
conversion disorder 56, 77, 108
conversion symptoms 102
core clinical psychiatry 39–78
core reading 3, 6
correlation between test items 116
corticospinal tract lesions 29
Cotard's syndrome 102
couvade syndrome 102
COX-2 inhibitors 164
CP450 161
Creutzfeldt–Jakob disease (CJD) 63, 64

- crime and mental illness, association between **177, 188**
 criterion validity of a test **133**
 cross-cultural studies **61**
 cross-dressing **45, 66**
 cross-sectional studies **61**
 cultural factors **176, 187**
 culture-bound syndromes **60**
 cyclothymia **184**
CYP1A2 161, 163
CYP2C9/10/19 161
CYP2D6 161, 163
CYP3A4 149, 151, 161, 163
- Dandy **186**
 declarative memory **144**
 deep tendon reflexes **36**
 defence mechanisms **114, 129, 130, 185**
 defensive attribution **138**
 degeneration theory **183**
 deindividuation **143**
 déjà vu **105**
 delayed ankle jerk **33**
 delayed conditioning **136**
 delinquency, predictors of **123, 141**
 delirium
 and dementia, differentiation between **41, 61**
 hepatic failure, EEG changes **21, 36**
 hyperactive **96**
 hypoactive **96**
 labile affect **26**
 pareidolia **96**
 withdrawal of sedatives **36**
 delirium tremens **36, 98**
 delusional disorder **184, 185**
 delusional infestation **86, 102**
 delusional memory **102**
 delusional misidentification syndromes **86, 102**
 delusional mood **102**
 delusional perception **102**
 delusions
 continuum of normal beliefs **61**
 Cotard's syndrome **102**
 dimensions **85, 101**
 ego syntonia **109**
 nihilistic **11, 26**
 paranoid **93, 110**
 pathological nature **110**
 primary **85, 91, 102, 107**
 schizophrenia **101**
 secondary **91, 107**
 as un-understandable **175, 186**
 dementia
 catastrophic reaction **93, 110**
 cognitive impairment required for
 diagnosis **41, 62**
 and delirium, differentiation between **41, 61**
- differentiating Lewy body type from Alzheimer's disease **20, 36**
 Ekbom's syndrome **102**
 frontotemporal **104**
 genetics **63**
 ideational apraxia **30**
MMSE 8, 24
 paraparesis **111**
 presenile **41, 62**
 prevalence among patients with depression **56, 78**
 prevention **42, 62**
 and pseudodementia, differentiation between **54, 76**
 rapidly evolving, with neurological features **42, 63**
 reversible and irreversible causes **42, 63**
 risk factors **41, 62**
 see also Alzheimer's disease; dementia with Lewy bodies
 dementia praecox **69**
 dementia pugilistica **62**
 dementia with Lewy bodies (DLB)
 differentiation from Alzheimer's disease **20, 36**
 REM behavioural disorder **78**
 visual hallucinations **97**
 denial **114, 129**
 Denver Developmental Scale **134**
 DEOR cycle **145**
 depersonalization **89, 106, 110**
 depot preparations **149, 161**
 depression
 anaclitic **130**
 and anankastic personality **74**
 aphasia **30**
 attribution styles **121, 139**
 atypical **48, 69**
 autoscopic hallucinations **98**
 bipolar disorder **48, 69**
 cognitive therapy **137**
 contraindications to SSRIs **156, 169**
 dexamethasone suppression test **34**
 dissociative fugue **76**
 double **49, 70**
 dulled perception **96**
 ECT **166**
 gender factors **69**
 genetics **70**
 and grief, differentiation between **51, 72**
 HADS **133**
 HDRS **28**
 hypercortisolism **47, 68**
 learned helplessness **137**
 longitudinal observation of recurrent depressive disorder **47, 68**
 natural course of untreated **67**
 nihilism **26**
 nutrient deficiencies **20, 35**
 OCD **70**
 panic attacks **67**

- postpartum 59
 postschizophrenic 46, 67
 predisposing factors 51, 72
 prevalence among patients with dementia 56, 78
 reactivity of affect, lack of 11, 26
 risk factors 49, 70
 scales 116, 132
 and schizophrenia, differences in anhedonia 92, 109
 screening instruments 117, 134
 self neglect 25
 sleep disturbance 75
 somatic syndrome 46, 67
 somatization 106
 depressive position 129
 depressive psychosis 102
 derailment 100
 derealization 106
 dereistic thinking 103
 descriptive phenomenology
 preparation for the exam 2
 recommended reading 3
 descriptive psychopathology 95
 essential components 95
 form and content 79, 96
 desultory thinking 103
 developmental insanity 183
 dexamethasone suppression test 18, 34
 di George syndrome 66
 diagnostic validity 40, 61
 diazepam 168
 dibenzothiazepines 155, 167
 diclofenac 33
 differential reinforcement schedules 136
 diffusion MRI 34
 diffusion of responsibility 143
 digoxin 161
 dimensional classification 41, 61
 diplopia 31
 directiveness in interviews 8, 24
 disability 191
 discontinuation reactions 157, 170
 discrimination, stimulus 135
 disorganized (hebephrenic) schizophrenia
 45, 66, 172, 183
 displacement 128
 dissociation 185
 dissociative 76, 107
 dissociative fugue 55, 76
 dissonance theory 139
 distributive justice 190
 dizziness 13, 27
 Dollard, John 142
 donepezil 163
 dopamine receptor antagonists 155, 168
 dopamine system stabilizers 150, 163
 dopamine transporter (DAT) SPECT scan 36
- Doppelganger (double phenomenon) 86, 103
 dose-dependent side-effects 151, 164
 dose-independent side-effects 164
 double depression 49, 70
 double orientation 91, 108
 double phenomenon (Doppelganger) 86, 103
 Down's syndrome 27
 downward social comparison 139
 draw a person test 131
 dream work 128
 dreams 114, 128
 drift theory 189, 191
 droperidol 35
 drug interactions 152, 156, 165, 169
 DSM-IV
 categorical classification 61
 and ICD-10, differences between 40, 60
 mania 69
 multiaxial system 40, 60
 OCD 25
 operational definition 42, 63
 organization of disorders in 59
 personality disorders, dimensional approach to 61
 principles 40, 60
 psychosis and affective illness, continuum
 between 60
 rapid cycling bipolar disorder 68
 schizophrenia 75
 DSM-IV-TR 67, 76
 duloxetine 161
 Dunham 191
 Durkheim 173, 185
 dying, stages of 122, 140
 dysmegalopsia 96
 dysthymic disorder 70
 dystonia 27
- eating disorder not otherwise specified (EDNOS) 76
 eating disorders 54, 76, 180, 191
 see also anorexia nervosa; bulimia nervosa
 Ebstein's anomaly 165
 ECG
 abnormalities 19, 35
 QTc interval 155, 168
 schizophrenia 19, 35
 echoic memory 144
 ECT
 contraindications 153, 166
 as first-line treatment 153, 166
 history 184
 indications 153, 166
 memory problems 153, 166
 mortality, causes of 153, 166
 passively compliant patients 190
 successful seizure activity after 21, 36
 unilateral and bilateral, comparison of 154, 166

- EEG
 changes 36
 delirium due to hepatic failure 21, 36
 rhythms, frequency 20, 36
 sleep phases 17, 33
 studies 18, 33
- ego 113, 127
 ego dystonia 100, 109
 ego syntonia 109
 egoistic suicide 185
 eidetic imagery 96
 Ekbom's syndrome 102
 elderly people, pharmacokinetics 153, 165
 elementary hallucinations 81, 97
 eligibility to sit the exam 1
 elimination of wrong answers 4, 5
 emergencies
 CT imaging 35
 common law principle of necessity 191
- emotional insight 25
 emotions, theories of 117, 133
 empathy 95
 encephalotrigeminal angiomas 32
 enmeshment 187
 epigenetic principles 144
 epilepsy
 dissociative fugue 77
 myoclonic 36
 petit mal (absence seizures) 36, 78
 temporal lobe 82, 104, 105
 tuberous sclerosis 16, 32
 epileptic seizures and pseudoseizures, differentiating between 18, 34
 episodic memory 144
 EPOR cycle 144
 equity theory 143
 Erikson, Erik 125, 144
 escape 136
 Esquirol 172, 184
 ethics, psychiatric 178–81, 189–92
 reading list 6
 ethology 179, 191
 evasion 25
 exclusion technique 4, 5
 explanatory psychopathology 95
 expressed emotions (EE) 176–7, 187–8
 extended matching items (EMIs) 1, 2
 external locus of control 140
 extinction 120, 134, 137
 extracampine hallucinations 82, 99, 110
 extrapyramidal dysarthria 29
 eyelid lag 31
 eyelid retraction 31
- Fabry's disease 32
 face validity of a test 133
- facilitative questions 7, 23
 factitious dermatitis 102
 factitious disorder 13, 28
 Fahr's disease 64
 Fairburn 141
 Falret 183
 familiarity, psychopathology of 89, 105
 fantasies 96, 97, 103
 Faris 191
 FAS test 132
 fear conditioning 136
 febrile delirium 97
 Feinberg hypothesis 65
 Festinger 139
 fetishistic transvestism 66
 figure ground principle 138
 firearms, use of 73
 first-order kinetics 149, 161
 first-pass metabolism, administration routes 148, 160
 first-rank symptoms (FRS) of schizophrenia 24, 84, 101, 172, 184, 185
 fixed interval reinforcement schedules 136, 137
 fixed ratio reinforcement schedules 136, 137
 floppy baby syndrome 165
 fluids refusal 166
 flumazenil 148, 161, 166
 fluoxetine 161, 164, 165, 169, 170
 flupentixol 167
 fluphenazine 167
 fluvoxamine 161
 flying, fear of 120, 137
 Flynn phenomenon 29
 folate deficiency 35
 folie à deux 92, 109
 folie circulaire 183
 Folstein 185
 food refusal 166
 form of thought 99
 formal operational stage of development 131
 formal thought disorder 87, 103
 assessment 88, 105
 Cameron 184
 repertory grids 105
 Schneider 184
- formication 98
 frame-shift errors 5
 free association 128, 185
 Fregoli syndrome 102
 Freud, Anna 185
 Freud, Sigmund 174
 dreams 128
 free association 185
 hysteria 185
 OCD 185
 reaction formation 129
 theories 113, 127

- Frontal Assessment Battery 132
 frontal lobe damage, case study 184
 frontal lobe functions, assessing 116, 131
 frontotemporal dementia (FTD) 104
 frustration-aggression hypothesis 142
 functional hallucinations 99
 fundamental attribution error 138
- Gage, Phineas 173, 184
 gait disturbance 14, 29
 astasia-abasia 29, 90, 107, 108
 Gall 185
 gallantamine 163
 gambling, pathological 90, 106
 Ganser's syndrome 98, 104, 105
 Gegenhalten 95, 108
 gender factors
 affective disorders 49, 69
 schizophrenia 45, 66
 gender identity disorder 66
 General Health Questionnaire (GHQ) 28
 general paralysis of the insane (GPI) 183
 generalization, stimulus 135
 genetics
 alcoholism 70
 Alzheimer's disease 42, 63
 bipolar disorder 70
 conduct disorder 70
 depression 70
 phobias 50, 71
 schizophrenia 70
 Geriatric Depression Scale (GDS) 134
 Gerstmann syndrome 31
 gestalt theory of perception 120, 138
 Gillick competence 191
 global aphasia 31
 go-no go test 132
 Goffman, A. 188
 Goldberg, E.M. 191
 Goldstein 88, 104
 goodness of fit 130
 gout 184
 Grandma's rule 139
 Grave's disease 16, 31
 Greisinger 183
 grief and depression, differentiation between 51, 72
 group study 3
 guarded patients 25
 Gudjonsson Suggestibility Scale 25
 guessing the answers 5
 Guillain-Barré syndrome 70
 Guntrip 141
- habituation 135
 haem in 33
 hallucinations 90, 107
 alcoholic hallucinosis 65
 auditory 81, 93, 97, 110
 autoscopic 82, 98, 106
 behaviours associated with 26
 Charles Bonnet 98
 closed questions 25
 elementary 81, 97
 extracampine 82, 99, 110
 functional 99
 haptic 98
 hypnagogic 93, 109, 110
 hypnopompic 109
 kinaesthetic 98
 lilliputian 81, 98
 proprioceptive 82, 98
 and pseudohallucinations, differences between 81, 97
 racial factors 178, 189
 reflex 99
 schizophrenia 101
 somatic 101, 110
 visual 81, 97
 visual acuity, reduced 81, 98
 hallucinogens 96, 97
 haloperidol 28, 159, 162, 164, 167
 Halstead Reitan Battery 132
 Hamilton Depression Rating Scale (HDRS)/Rating Scale for Depression (HAM-D) 28, 132, 134
 handicap and impairment, difference between 180, 191
 hanging 73
 hangover; alcohol 96
 haptic hallucinations 98
 Hare 185
 Harlow, Harry 123, 141
 headache
 cluster 16, 29, 32
 migraine 29, 32, 96
 tension 29
 thunderclap 14, 29
 hebephrenic (disorganized) schizophrenia 45, 66, 172, 183
 Hecker 183
 helplessness, learned 120, 137, 139, 140
 Helsinki declaration 180, 191
 hemisection of the spinal cord 16, 31
 hemp insanity 67
 hepatic failure/impairment
 antipsychotics 154, 167
 EEG changes 21, 36
 heteroreceptors 159
 Hierarchy of Needs Theory 126, 145
 history of psychiatry 171–5, 181, 183–6, 192
 reading list 6
 histrionic personality 53, 74, 111
 Hospital Anxiety and Depression Scale (HADS) 133
 hospitalism 130

- humour
 in clinical interview 95
 as defence mechanism 130
- Huntington's disease 28, 43, 64
- hydrocephalus, normal pressure 43, 64
- hyperactive delirium 96
- hyperacusis 96
- hypercortisolism 68
- hyperlipidaemia 35
- hyperstartling 178, 189
- hypertonia 36
- hypnagogic hallucinations 93, 109, 110
- hypnopompic hallucinations 109
- hypnosis 185
- hypoactive delirium 96
- hypochondriasis 55, 77
- hypomania 28, 67, 184
- hyponatremia 160
- hypotheticodeductive reasoning 141
- hypothyroidism
 delayed ankle jerk 33
 lithium side-effect 150, 162
 manifestations 12, 27
 rapid cycling bipolar disorder 68
 tendon reflexes 21, 36
- hypsarrhythmia 36
- hysteria 174, 185, 186
- I want messages 23
- ICD-10**
 anxiety 67
 bipolar illness 68
 categorical classification 61
 Chapter V, organization of disorders in 39, 59
 cyclothymia 184
 depression 67
 and DSM-IV, differences between 40, 60
 multiaxial system 60
 multiple personality disorder 76
 neurasthenia 77, 183
 operational definition 42, 63
 postschizophrenic depression 67
 principles 40, 60
 PTSD 72
 schizoaffective disorder 40, 60
 schizophrenia 110
 schizotypal disorder 67
 somatic syndrome 46, 67
- iconic memory 144
- ideas of reference 103
- ideational apraxia 30
- ideomotor apraxia (IMA) 30
- illusory correlation 138
- imagery 80, 96, 97
- imaginative thinking 103
- immigrant children, peer groups 123, 142
- impairment and handicap, difference between 180, 191
- imprinting 139, 141, 179, 191
- impulse control symptoms 106
- individual psychology theory 127, 128
- individualism 138
- infantile spasms 36
- inferiority complex 128
- informed consent 179, 190
- insanity, humane and moral treatment of 171
- insight
 assessment of 9, 25
 neurological conditions comparable to loss of 98, 105
 pseudohallucinations 97
- institutionalization 188
- insulin coma therapy 183
- integrity versus despair stage, psychosocial development 144
- intellectual insight 25
- intense perceptions 80, 96
- intermetamorphosis 102
- intermittent explosive disorder 106
- intermittent reinforcement schedules 137
- internal consistency of a test 132
- internal locus of control 140
- International Pilot Study on Schizophrenia (IPSS) 175, 187
- interpretations 23
- interpreters 176, 187
- inter-rater reliability 132
- interval schedules of reinforcement 136
- introjection 129
- inverse agonists 159
- IQ**
 criminal behaviour 188
 premorbid 115, 131
 test 117, 133
- irrational fears 50, 71
- isocarboxazid 169
- isolation 130
- jamais vu 105
- James-Lange theory of emotions 133
- Janov, Arthur 186
- jargon (Wernicke's) aphasia 30, 110
- Jasperian hierarchy 59
- Jaspers, Karl 186
- jaw jerk, exaggerated 36
- jealousy, morbid 102
- jumping to conclusions 107
- Jung, Carl 185
- justice 190
- Kahlbaum, Karl 183, 184
- Kane 175, 186
- Kay 185
- Kelly's personal construct theory 105
- kinaesthetic hallucinations 98

- Klein, Melanie 114, 129, 141, 171
Kleine–Levin syndrome 57, 78
kleptomania 65, 106
koro 177, 189
Korsakoff's syndrome 27, 43, 64, 111
Kubler-Ross, Elizabeth 140

labelling theory 189
labile affect 26
laboratory studies, diagnostic validity 61
Lacan, Jacques 183
lamotrigine 156, 159, 164, 169
lanugo hair 33
latah 189
latent dream content 128
learned helplessness 120, 137, 139, 140
learning disability
 closed questions 25
 compliant not capable patients 189
 schizophrenia 65
 tuberous sclerosis 16, 32
Leff, J. 187
legal justice 190
legal privilege 190
leucocytosis 156, 169
leucopenia 169
Lewis, Aubrey 192
Lewy body dementia see dementia with Lewy bodies
lid lag 31
lid retraction 31
life events 68
lilliputian hallucinations 81, 98
limb-kinetic apraxia 30
limit setting 24
lithium 159
 blood levels 152, 164
 cluster headache 32
 gout 173, 184
 leucocytosis 169
 migraine, ineffectivity in 32
 perinatal period 165
 serotonin syndrome 169
 side-effects 150, 160, 162
 speech disturbance 87
 steady state 148, 160
 therapeutic window 165
 toxicity 17, 19, 33, 34
locus of control 140
lofepamine 168
lofexidine 147, 159
longitudinal studies 61
Lorenz, Konrad 139, 141
lower motor neurone lesions 31, 36

macropsia 96
made phenomena, schizophrenia 101

magnetic resonance imaging (MRI) 19, 21, 34, 35, 37
Mahler, Margaret 114, 129, 130
malaria therapy 171, 183
malingering 25, 28, 56, 97
mania 25
 DSM-IV 48, 69
 intense perceptions 96
 labile affect 26
 natural course of untreated 46, 67
 sleep disturbance 54, 75
 speech disturbance 83, 100
 YMRS 28, 133
manic depression see bipolar illness
manifest dream content 128
MAOIs 169, 184
marking of exam 2
masculine protest 128
Maslow's Hierarchy of Needs Theory 126, 145
Maudsley Assessment of Delusions Scale 101
melatonin 168
memantine 163
memory 126, 144
 ECT 153, 166
Mendel 184
mental capacity status 178, 189
Mental State Examination 187
mescaline 96
Mesmer, Anton 183, 185
mesmerism 183, 185
metabolic syndrome 20, 35
metonymy 103
Meyer, Adolf 192
mianserin 162
micropsia 96, 98
migraine 29, 32, 96
Milgram, Stanley 124, 142
Mini Mental State Examination (MMSE) 8, 24, 26, 131, 185
Minnesota Multiphasic Personality Inventory (MMPI)
 28, 131
minorities in social communities 124, 142
mirtazapine 150, 162
mitgehen 108
mock tests 3
moclobemide 161, 169
Moniz 184
monomania 184
Montgomery–Åsberg Depression Rating Scale
 (MADRS) 132
mood and affect, difference between 11, 26
mood disorders 108
morbid jealousy 102
Morel 171, 183
Moreno 184
motor aphasia 30
motor neurone disease 64
motor neuropathy 36

- Mowrer's hypothesis 137
multiple choice questions (MCQs) 1
 approach to 4–5
 marking 2
 practice tests 3
multiple personality disorder 55, 76
multiple sclerosis 77
Munchausen's syndrome 111
murderous intentions 180, 191
mutism 90, 107
myalgic encephalitis see chronic fatigue syndrome
myasthenia gravis 29
myocarditis 162
myoclonic epilepsy 36
naïve psychology 138
naloxone 161
naltrexone 164
narcissistic personality disorder 73
narcoanalysis 185
narcolepsy 54, 75
narcolepsy-cataplexy 109
narrowed repertoire of drinking 65
National Adult Reading Test (NART) 131
near death experiences 90, 106
needs, hierarchy of 126, 145
nefazodone 161
negative autoscoppy 98
negative reinforcement 136
negative schizophrenia 24, 66
negativism 95, 108
neologism 103, 109
neophobia 72
neurasthenia 77, 171, 183
neurofibromatosis 32
neuroleptic malignant syndrome 28, 164
neuropathic basis for psychiatric disorders 183
neurosurgery 184
neurosyphilis 29
night terrors 71
nihilism 11, 26
nitrazepam overdose 148, 161
nocebo effect 148, 161
nocturnal panic attacks 71
non-adherence with treatment 148, 160
normal pressure hydrocephalus (NPH) 43, 64
normal thinking processes 87, 103
nortriptyline 165
NSAIDs, and lithium clearance 164
nymphomania 184
obedience 142
object permanence 141
object relation theorists 141
observational learning 137
observer reliability 61
obsessions 84, 100, 109, 110
obstruction 95
obstructive questions 23
OCD
 and anankastic personality 74
 clinical presentation 50, 70
 illustrative case 185
 insight 25
 prognostic factors 52, 72
 and schizophrenia, differentiation between 71
 and Sydenham's chorea 49, 70
olanzapine 160, 162, 163
weight gain 167
xanthoma 20, 35
open questions 7, 23
operant conditioning 136, 137
operational definition 42, 63
opiate withdrawal 27
opioid overdose 161
opponent-process theory of emotions 133
opposition 95
orally administered drugs 160
organ inferiority 128
organic brain disease 100
organophosphates 163
out of body experiences 106
out of the blue panic attacks 71
overinclusion 104, 184
overvalued ideas 86, 103, 109
palinopsia 82, 98
PANDAS 70
panic attacks/panic disorder
 depressive disorder 47, 67
 dizziness 27
 features 51, 71
 medical causes 54, 75
 peaks in age distribution of 51, 72
Paper I 1–2
 topics/syllabus 2
paracetamol overdose 73
parallel-form reliability 132
paralytic ileus 147, 160
paranoia 110
paranoid delusions 93, 110
paranoid personality disorder 73, 103
paranoid-schizoid position 129
paraphrenia 55, 76
parapraxis 111
pareidolia 96, 97
parietal lesions 98
Parkinson's disease 57, 64, 78
paroxetine 161
 anticholinergic activity 164, 169
 discontinuation reaction 170
 effect on sleep 151, 164

- Parsons 187
 partial agonists 159
 passively compliant patients 190
 passivity phenomena 84, 100
 pathological laughter and crying (PLAC) syndrome 26
 perinatal psychiatry 152, 165
 persecutory anxiety 129
 perseveration 83, 100, 109
 personal construct theory 105
 personality assessment, projective tests 115, 131
 personality disorders 61
 petit mal epilepsy (absence seizures) 36, 78
 phantom limb 82, 98
 phantom mirror images 98
 pharmacodynamic drug interactions 152, 165
 pharmacokinetics
 drug interactions 165
 elderly people 153, 165
 phenelzine 169
 phenobarbital 161
 phenomenology 95
 descriptive 2, 3
 phenytoin 159, 161
 phobias 71, 120, 137
 fear conditioning 136
 genetics 50, 71
 illustrative case 174, 185
 phonemes 97
 phosphenes 97
 phrenology 174, 185
 Piaget, Jean 115, 131, 141
 pimozide 35, 168
 Pinel, Phillippe 183
 pipothiazine 167
 placebos 161
 plasma concentration of a drug 149, 162
 pneumoencephalography 186
 polymorphic ventricular arrhythmia (torsades de pointes) 35
 polythematic questioning 23
 Positive and Negative Symptoms Scale (PANSS)
 132, 133, 185
 positive reinforcement 136
 postpartum blues 59
 postpartum depression 59
 postpartum disorders 39, 59
 postpartum psychosis 59
 postschizophrenic depression 46, 67
 post-traumatic stress disorder (PTSD)
 predisposing factors 51, 71
 time course 52, 72
 posturing 108
 postviral fatigue see chronic fatigue syndrome
 poverty of content of speech 100
 practice tests 3
 predictive validity of a test 133
 pregnancy
 ECT 166
 pseudocyesis 102
 psychopharmacology 152, 165
 sympathetic 85, 102
 Premack's principles 139
 premorbid IQ 115, 131
 premorbid personality 9, 25
 preoperational stage of development 131
 preparation for the exam 2–4, 5
 presenile dementia 41, 62
 presenilin 1: 63
 presenilin 2: 63
 pressured speech 103
 prevalence of disease, measuring 117, 133
 primacy effect 144
 primal therapy 175, 186
 primary process revision, dream work 128
 primary process thinking 113, 127
 primary repression 129
 prion dementia 42, 63, 64
 procedural memory 144
 Prochaska's Transtheoretical Model of Change 125, 143
 procyclidine 27
 projection 129
 projective identification 129
 projective tests of personality assessment 115, 131
 pronominal reversal 94, 111
 propranolol 32
 proprioceptive hallucinations 82, 98
 proximal muscle weakness 29
 pseudobulbar palsy 26, 29, 36, 64
 pseudocyesis 102
 pseudodementia 54, 76
 pseudohallucinations 81, 97, 98
 pseudologica fantastica 111
 pseudoseizures 18, 34
 psychiatric 'caseness' 28
 psychiatry, first use of term 181, 192
 psychobiology 192
 psychodrama 184
 psychology 113–45
 preparation for the exam 2
 recommended reading 3, 6
 psychopathology 79–111
 recommended reading 3, 6
 psychopharmacology 147–70
 recommended reading 3, 6
 psychosexual stages of development 127
 psychosis
 hallucinatory behaviours 26
 postpartum 59
 psychosocial development, stages of 125, 144
 psychotherapy, transference in 113, 128
 psychotic depression 26
 psychotic patients 25

- punishment and negative reinforcement, difference between 136
 punning 103
 pure word blindness (alexia) 31, 104, 110
 pure word deafness 30, 88, 104
 pure word dumbness 104
 put down questions 7, 23
 pyromania 106
 QT interval 19, 35, 168
 question banks 5–6
 quetiapine 162, 167
 random guessing 5
 rapid cycling bipolar disorder 47, 68
 ratio schedules of reinforcement 136
 rational thinking 103
 reaction formation 129
 reactivity of affect 26
 reading
 disturbance 15, 31
 preparation for the exam 2–4
 recommended 3, 6
 recency effect 144
 reciprocity norm 143
 recurrent depressive disorder 47, 68
 re-direction 24
 reduplicative paramnesia 91, 102, 108
 reflections 23
 reflex hallucinations 99
 refusal of food and fluids 166
 Reil, Johann Christian 192
 reinforcement 120, 137
 schedule of 136
 reliability of a test 61, 132
 REM behavioural disorder 78
 repertory grids 88, 105
 repetition 111
 repression 128, 129
 reserpine 168
 residual schizophrenia 66
 resistance 128
 responsibility, diffusion of 143
 reuptake inhibitors 147, 159
 revision 2–3
 Rey Osterreith Complex Figure Test (ROCF) 131
 rhyming 103
 rights based justice 190
 risperidone 160, 162, 163
 acute dystonic reaction 27
 depot preparation 161
 potency 167
 rivastigmine 163
 Romberg's sign 31
 Rorschach Test 131
 Rotter, Julian 140
 run on questioning 23
 running amok 181, 192
 Russell's sign 12, 27
 St John's wort 161
 Sakel 183
 salbutamol 169
 Schachter–Singer theory of emotions 133
 schedule of reinforcement 136
 Scheff, Thomas 189
 schizoaffective disorder 40, 60, 66
 schizoid personality disorder 52, 73, 74
 schizophrenia
 age disorientation 91, 108
 age of onset 65
 auditory hallucinations 81, 97
 autoscopy 98
 beliefs 9, 25
 and bipolar disorder, differentiation between 49, 69
 BPRS 133
 cannabis use 46, 67
 catatonia 108
 cenesthopathic 110
 chemically induced seizures 183
 clinical features 70
 clozapine versus chlorpromazine 175, 186
 coma therapy 172, 183
 concrete thinking 104
 Cotard's syndrome 102
 and depression, differences in anhedonia 92, 109
 and di George syndrome 45, 66
 double orientation 91, 108
 DSM-IV and ICD-10, differences between 60
 ECG 19, 35
 family's emotional expression 188
 fathers of patients 180, 191
 first-rank symptoms 24, 84, 101, 172, 184, 185
 formal thought disorder 88, 105
 gender differences 45, 66
 global, cultural, and social differences 175, 187
 hallucinations 65
 hebephrenic (disorganized) 45, 66, 172, 183
 heritability 70
 history 184
 insight 25
 lifetime prevalence 53, 75
 literal meaning 174, 186
 low type–token ratio 103
 migrant population 178, 189
 negativism 79, 95
 neologisms 93, 109
 neurodevelopmental hypothesis 44, 65
 non-adherence with treatment 160
 and OCD, differentiation between 70
 overinclusion 104
 PANSS 133

- paraphrenia 76
 perceptual errors 96
 perseveration 100
 pneumoencephalography 186
 postschizophrenic depression 46, 67
 predictors of outcome 48, 69
 prevalence, lifetime 53, 75
 prevalence in twins 45, 66
 private symbolism 103
 risk of developing 44, 65
 schizotypal disorder 67
 self neglect 25
 sensitive ideas of reference 103
 speech disturbance 83, 93, 100, 110
 suicide rate 53, 74
 symptoms 8, 24
 verbigeration 109
 schizotypal disorder 46, 60, 67
 Schneider, Carl 184
 first-rank symptoms of schizophrenia 24, 84, 101, 172, 184, 185
 secondary repression 129
 secondary revision, dream work 128
 secure base 130
 seizures
 chemically induced 183
 epileptic 18, 34
 successful seizure activity after 21, 36
 self-disclosures 23
 self harm 52, 73
 self immolation 73
 self neglect 10, 25
 self-referential encoding (SRE) effect 139
 self-serving bias 138
 Seligman, Martin 120, 137, 139
 semantic memory 144
 semiotic function 141
 sensitive ideas of reference (sensitive Beziehungswahn) 103
 sensitivity of a test 61
 sensitization 135
 sensorimotor stage of development 131
 sensory ataxia 29
 sensory memory 144
 sentence completion test 131
 separation anxiety 130
 separation individuation (SI) theory 129, 130
 serial invalidation 105
 serial position effect 144
 Serial Sevens Test 10, 26
 serotonin syndrome 156, 164, 169
 sertrindole 35
 sertraline 161
 sexual abuse 9, 25
 sexual dysfunction 145
 of arousal phase 66
 sexual orientation 66
 sexual preference, disorders of 66
 sexual response, phases of 126, 145
 shagreen patches 16, 32
 shape constancy 138
 shaping 137
 Shook Yang 189
 short delayed conditioning 136
 short-term memory 144
 shyness 72
 SIADH 156, 170
 sick role 176, 187
 silence 23
 simultaneous conditioning 136
 situational panic attacks 71
 situationally predisposed panic attacks 71
 Skinner, B.F. 120, 137
 sleep
 EEG studies 17, 33
 phases 17, 33
 sleep disorders/disturbance 50, 71
 depression 75
 Kleine-Levin syndrome 57, 78
 mania 54, 75
 narcolepsy 54, 75
 Parkinson's disease 57, 78
 somnambulism 54, 75
 sleepwalking 54, 75
 slow triphasic waves, EEG 36
 smoking 62, 164
 social causation theory 189, 191
 social comparison theory 139
 social drift theory 189, 191
 social exchange theory 143
 social facilitation 124, 143
 social identity theory 140
 social learning theory of personality 140
 social phobia
 features 47, 68
 predisposing factors 51, 72
 self neglect 25
 social psychiatry 175–8, 181, 187–9, 192
 social responsibility 143
 societal influence on mental illness 178, 189
 sociometry 184
 somatic hallucinations 101, 110
 somatic passivity 101
 somatization 89, 102, 106, 110
 ICD-10 46, 67
 cultural factors 187
 and hypochondriasis, differentiation between 55, 77
 somnambulism 54, 75
 sorting tests 87, 104
 spastic gait 29
 spastic tongue 29
 spasticity, differentiation from catatonic rigidity 92, 108
 specificity of a test 61

- speech disturbance **14, 29, 87, 88, 103, 104**
 asyndesis **87, 103**
 lithium **87**
 mania versus schizophrenia **83, 100**
 Sperrung **95**
 spike and wave pattern, EEG **36**
 spinal cord
 hemisection **16, 31**
 subacute combined degeneration of the **13, 28**
 spirituality **175, 187**
 Spitz, Rene **130**
 split-half reliability **132**
 splitting **129**
 Spot the Word Test **131**
 SSRIs
 antidepressant effect **164**
 contraindications **156, 169**
 discontinuation reaction **170**
 lithium clearance **164**
 serotonin syndrome **156, 169**
 SIADH **170**
 side-effects **155, 160, 164, 168**
 withdrawal, newborns **165**
 stability of affect **26**
 Stanford-Binet Scale **131, 134**
 stereotyping **138**
 Sternbach's criteria **169**
 Stevens Johnson syndrome **164**
 stigma associated with mental illness **177, 188**
 stimulus preparedness **137**
 stock words **103**
 stream of thought **99**
 stroke **11, 26, 63**
 structural model of the mind **127**
 study groups **3**
 study leaves **5**
 Sturge-Weber syndrome **32**
 stuttering **100**
 subacute combined degeneration of the spinal cord
 (SACD) **13, 28**
 subarachnoid haemorrhage **29**
 subarachnoid space, air injection into **175, 186**
 subjective doubles, syndrome of **102**
 sublimation **130**
 substance misuse **12, 27**
 suggestible patients **25**
 suicide and suicidal ideation/risk
 clinical skills **8, 24**
 Durkheim **185**
 ECT **166**
 eliciting risk **11, 26**
 methods of suicide **73**
 primary care practitioner, visits to **52, 73**
 risk factors **56, 77**
 schizophrenic patients **53, 74**
 sulpiride **162**
 summarization **24**
 supportive interventions **8, 24**
 suppression **129**
 Sydenham's chorea **49, 70**
 syllabus for Paper I **2**
 syllogistic reasoning **141**
 sympathetic pregnancy **85, 102**
 sympathy **95**
 synaesthesia **83, 99**
 systematic desensitization **135**
 Szasz, Thomas **192**
 tacrine **163**
 tangentiality **100, 104**
 Tarasoff ruling **191**
 tardive akathisia **163**
 tardive dyskinesia (TD) **155, 163, 168**
 tardive dystonia **166**
 temazepam **166**
 temporal arteritis **29**
 temporal conditioning **136**
 temporal lobe epilepsy (TLE) **76, 98, 105**
 tension headache **29**
 test-retest reliability **61, 132**
 tetrabenazine **168**
 Thematic Apperception Test (TAT) **131**
 therapeutic index **162**
 therapeutic privilege **190**
 therapeutic relationship, boundary violations **181, 192**
 therapeutic windows **152, 162, 165**
 thiamine deficiency **27, 64**
 thiazide diuretics **164**
 thioridazine **35, 168**
 Thomas **130**
 thought, pathology of **83, 99**
 thought blocking **57, 78, 100**
 thought broadcasting **100, 101**
 thought echo **101**
 thought insertion **100, 101**
 Thought Language and Communication scale **185**
 thought phenomena, schizophrenia **100, 101**
 thought withdrawal **100, 101**
 thunderclap headaches **14, 29**
 time management in exams **4**
 top-down processing of perception **138**
 topographical model of mind **127**
 torsades de pointes **35**
 trace conditioning **136**
 training requirements **1**
 transcendental experiences **106**
 transcortical aphasia **30**
 transference **128**
 transitional objects **130**
 transvestism, fetishistic **66**
 tranylcypromine **169**
 trephination **184**

- trichotillomania **44, 65**
 tricyclic antidepressants (TCAs)
 cardiovascular illness **155, 168**
 overdose **73**
 pregnancy **165**
 side-effects **155, 165, 168, 169**
 trigeminal neuralgia **17, 32**
 trigeminal neuropathy **17, 32**
 tuberous sclerosis **32**
 Tuke, William **183**
 twins, schizophrenia prevalence **45, 66**
 twirling **111**
 two-factor theory of emotions **133**
 type–token ratio **103, 105**
 tyramine **169**

 upper motor neurone lesions **15, 31, 36**
 upward social comparison **139**

 validity
 of a diagnosis **40, 61**
 of a test **61, 133**
 valproate **159, 164, 169**
 variable interval reinforcement schedules **136, 137**
 variable ratio reinforcement schedules **136, 137**
 variant Creutzfeldt–Jakob disease (vCJD) **64**
 vascular dementia **63**
 Vaughn, C. **187**
 velo–cardio–facial syndrome (VCFS) **66**
 venlafaxine **161, 170**
 verbal fluency **132**
 verbigeration **109**
 vicarious learning **137**
 visual acuity, reduced **98**
 visual disturbances **82, 98**
 visual hallucinations **81, 97**
 vitamin E **168**
 volume of distribution **161**

 von Jäuregg, Wagner **183**
 von Meduna **183**
 vorbeigehen **104**
 vorbereiten **104**

 waddling gait **14, 29**
 waiting lists **179, 190**
 waiver **190**
 Wechsler Adult Intelligence Scale (WAIS)
 116, 131, 132, 134
 Wechsler Intelligence Scale for Children (WISC III) **134**
 Wechsler Preschool and Primary Scale of
 Intelligence (WPPSI) **134**
 Wechsler Test of Adult Reading **131**
 Wernicke's aphasia **30, 110**
 Wernicke's encephalopathy **27**
 Wernicke–Korsakoff syndrome **64**
 West's syndrome **36**
 Westphal, Carl Otto **185**
 Wilson's disease **64**
 Winnicott, D. **130**
 Wisconsin Card Sorting Test (WCST) **131**
 word association tests **105**
 working memory **144**
 Workplace Based Assessments (WPBA) **1**
 wrist cutting **73**
 writing disturbance **15, 31**

 xanthomas **20, 35**

 Young's Mania Rating Scale (YMRS) **28, 133**

 zaleplon **166**
 zero-order kinetics **149, 162**
 ziprasidone **167**
 zopiclone **159**
 zuclopentixol **167**

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FOREWORD

Passing the MRCPsych examination is a major milestone in the career of every aspirant psychiatrist in the UK. This examination specifies the minimum levels of knowledge and skills that are essential for gaining the membership of the College.

Rajeev Krishnadas and Lena Palaniyappan have had extensive and varied training and experience, in both research and teaching. They are both clinical lecturers with proven track records in teaching, developing, and publishing educational materials and organizing the successful SPMM course for trainee psychiatrists. In fact, Lena Palaniyappan was awarded the Laughlin Prize in the MRCPsych exams.

There are many books of varying quality on the market for candidates sitting the MRCPsych exams. What differentiates an outstanding book from an ordinary book is that in addition to aiding passing the exams, the former also promotes learning that would ultimately make the readers wiser and help improve patient care.

The authors have used their teaching skills and experience to develop an exhaustive range of questions in the Royal College's new format. They have taken utmost care to perfectly match the questions with the Paper 2 syllabus, and to the levels of complexity and the topic-wise breakdown of questions in the real exams. They have organized the questions in five mutually exclusive chapters in a way that would facilitate focused learning. Finally, they provide detailed, well-researched and referenced explanatory answers for every question. Thus, they have made this a really outstanding book.

I recommend this excellent book to candidates sitting the Paper 2 of the MRCPsych examinations. I am confident that this book will significantly increase their chances of passing at the first attempt.

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This work began with an idea of producing an easy-to-use revision aid for the new MRCPsych exams. The compilation, drafting and research work behind the production of these MCQs were inspired by a number of colleagues and friends. We are thankful to all of them and we hope we will be able to deliver what they envisaged throughout the making of this book.

Prof Rajarathinam inspired LP to take up psychiatry—not only as a profession to practice, but an experience to cherish and impart. If this book helps at least one motivated trainee to sustain his interest and take him closer to practicing psychiatry as a profession lifelong, we will rejoice that Prof. Rajarathinam's effort has not been wasted.

Dr Thambirajah helped us throughout the production of this book. Dr Kopal Tandon reviewed the genetics chapter and we are grateful for her thoughtful comments. Dr Niruj Ahuja from Newcastle helped us to ensure delivery of accurate facts based on high quality of evidence while preparing the chapter on epidemiology. Numerous trainees from Newcastle, Derby and Nottingham helped us to constantly revise the content through their first hand experience of the exam. A special thanks to Dr Albert Michael for writing the foreword.

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CONTENTS

Introduction	1
1 Psychiatric genetics	
Questions	9
Answers	27
2 Epidemiology	
Questions	49
Answers	65
3 Advanced psychology	
Questions	83
Answers	99
4 Pharmacology	
Questions	117
Answers	137
5 Neurosciences	
Questions	161
Answers	191
Index	227

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INTRODUCTION

MRCPsych exams are the most important exams a psychiatry trainee in the UK will sit during his or her career. Passing the MRCPsych is the most perceptible of the criteria that demonstrate the achievement of a number of competencies during the training.

WHO CAN SIT THE EXAM?

The details are clearly given in the Royal College website. They are summarized below for quick reference. Please note that these are subject to change and so we recommend checking with information at <http://www.rcpsych.ac.uk> before you apply.

Training requirements^{1,2}

Candidates must have completed the mandatory training period of 12 months of post foundation training in psychiatry by the date of sitting the written exams. The recommended time frame for attempting Paper 2 is when the candidate is 18 to 24 months into his or her training. Posts must be part of a programme of training approved by PMETB or recognized by the Hospital or Trusts as having specific time, programme (journal clubs, grand rounds, teaching, supervision, etc.) and funds allocated for training. Individual posts can be of either 4 or 6 months' duration. In addition, the college also has placed emphasis on successful completion of the annual review of competency progression (ARCP) and other work place based assessments (WPBA) to be eligible for training. *The exact details need be confirmed from the college website as they are subject to regular reviews.*

WHAT IS PAPER 2?

The MRCPsych Paper 2 is 3 hours long and contains 200 questions. The paper consists of multiple choice questions (MCQ = 75%) and extended matching items (EMI = 25%). MCQs are in the 'best of five' (BOF) format. A best of five MCQ comprises a question stem of varying length, followed by a list of five options. Candidates should choose the single best option that answers the question.

The college has retained the EMI format from the previous pattern in the new format. An EMI comprises a specific theme (sometimes with a short description), followed by a set of answer choices (often in an alphabetical order) and a lead-in statement explaining what the candidate is being asked to do. This lead-in statement is then followed by a question list, set out in a logical order. The questions may be asked in form of clinical vignettes. The candidate may be required to choose more than one answer from the list of options for an individual question; in this case, the number of correct options will be clearly marked adjacent to the question.

Topics/syllabus for the Paper 2 exam

Neurosciences

- Neuroanatomy
- Neuropathology
- Neurophysiology

Neuroendocrinology
Neurochemistry
Neuroimaging
Developmental neuroscience

Psychopharmacology

Pharmacokinetics
Pharmacodynamics
Adverse reactions
Theories of action
Drug dependence
New drugs
Pharmacogenetics

Genetics

Cellular genetics
Molecular genetics
Behavioural genetics
Endophenotypes
Genetic epidemiology
Gene–environment interaction

Epidemiology

Surveys across the lifespan
Measures

Advanced psychological processes and treatments

Neuropsychology
Personality and personality disorder
Developmental psychopathology (including temperament)
Therapy models, methods, processes and outcomes
(BT, CBT, Family/couples, Interpersonal, Psychoanalytic, Psychoeducation)
Treatment adherence
Psychosocial influences

HOW TO PREPARE FOR THE EXAM

The MRCPsych journey starts the very day the training starts. This should be directed towards gaining the requirements towards sitting the exam, as well as getting a good knowledge of the theories that underlie the principles and practice of psychiatry. Reading for MRCPsych Paper 2 should ideally start as soon as one passes MRCPsych Paper 1. It is best to start reading around the cases that a trainee sees on a daily basis at the out-patient clinics and in-patient unit. These cases could be discussed with the supervisor and used for case-based discussions. A good place would be to start with epidemiology. For example, one could discuss risk factors for a particular clinical condition seen in a patient during a supervision session. In the process, the trainee can read around incidence and prevalence rates from standard sources such as the *British Journal of Psychiatry*. This process will help cultivate a regular journal- reading habit. So by 6 to 8 months after passing Paper 1, a trainee could familiarize him or herself with most of epidemiology, neurosciences, advanced psychology, genetics, and advanced psychopharmacology, which are covered in Paper 2. It will be a good idea to get the timetable and the topics at the local deanery MRCPsych course and read the relevant material before going in for the teaching sessions. This is particularly relevant for psychology (where we may not get a lot of opportunity to discuss topics with a psychologist in clinical practice) and neurosciences. In our experience, often the topics covered at teaching sessions do not correlate with exam syllabi or exam schedules. This can be particularly difficult and has to be taken into consideration during the study period.

Some of the most challenging topics for the Paper 2 exam include neurosciences, epidemiology, and genetics. In our opinion, one must leave no stone unturned when preparing for these topics. These topics are especially challenging as one does not deal with them routinely in the everyday practice of psychiatry. A substantial period must be devoted to prepare for these topics.

During the final 8–10 weeks preceding the exam, it would be best to create a timetable, with the syllabus and curriculum in mind, so as not to leave out important topics. Reading during this period should be exam-oriented and should be done along with practice multiple choice questions. This could be done on your own or in a study group. Preparing in a group helps to get an idea of where one stands with respect to the knowledge base.

Practice tests

A number of revision courses are now available for the new MRCPsych exams. Revision courses and materials could be used only to aid rapid revision and synthesize exam techniques. But it is best to revise from material the candidate has already read during the previous 10 months, rather than starting afresh. The MRCPsych exam prepares a psychiatric trainee for lifelong learning. It is best not to rely exclusively on 1 or 2 days of cramming to gain knowledge that sets your career on track.

It is very beneficial to take a number of mock and practice tests before the exam as these will give a fairly good idea of one's strengths and weaknesses. Look out for mock exams conducted by industry sponsors and local tutors. If possible, request your senior colleagues to organize a mock exam. It is best to do mock exams under the actual exam conditions, that is in paper and pencil format, using 200 questions and timing it at 180 minutes.

Books to read

Knowledge is not derived from textbooks alone. All kinds of resources are useful, including the internet, but it is best to base the core reading on standard textbooks. These textbooks should form the basis of reading, but reading should not be restricted to these.

The two reference books that we recommend are *Kaplan and Sadock's Comprehensive Textbook of Psychiatry* (this is an American book, which is comprehensive, with DSM and ICD criteria, and forms excellent reading in psychology, psychopharmacology, and neurosciences in addition to clinical psychiatry) and the *New Oxford Textbook of Psychiatry* (the latest edition is on its way). Both are two-volume textbooks and are useful for all parts of the exams. For core text revision, the *Shorter Oxford Textbook of Psychiatry* is a very good book. Each chapter is written in an authoritative style and is relevant to training in the UK. At the end of each section or topic there is a reference for further reading on the topic, which is invaluable. Most psychiatric epidemiology is covered extensively in these textbooks.

A good introductory textbook for psychopharmacology is Stephen Stahl's *Essential Psychopharmacology: Neuroscientific Basis and Practical Applications*. It is very lucid to read with a number of diagrams, which help understanding of the basis of psychopharmacology.

There are a number of books for basic psychology. *Psychology: Themes and Variations* by Wayne Weiten is especially recommended. It is an American book which is very easy to read with a lot of examples. Thambirajah's *Psychological Basis of Psychiatry* is also a good book, specifically designed for MRCPsych exams. These books should be of use for both Papers 1 and 2. In addition, these reference books give a good account of psychological tests and psychotherapies.

Basic neuroscience is a difficult subject to revise; most of us lose touch with the volatile facts regarding anatomy and physiology of the central nervous system. A good bet would be to use the same books that you used for undergraduate study for topics such as neurophysiology or neuroanatomy. Another fantastic resource, and especially recommended by the authors for all aspects of basic and clinical sciences, is the series of reviews produced by the American College of Neuropsychopharmacology under the title *Neuropsychopharmacology: the Fifth Generation of Progress*.

It is available, free of cost, online from the American College of Neuropsychopharmacology (ACNP) website. (Go to <http://www.acnp.org> and follow the link to publications.) This is also a good resource for basic genetics. Unfortunately, access for further updates of this resource now needs a paid subscription.

Genetics can be revised from reading the free-to-download book *Seminars in Psychiatric Genetics*, published by the Royal College. Please be aware that though it provides a good grounding for basic genetic concepts, it is nearly 16 years old and psychiatric genetics has moved well ahead of this book. An updated (2004) edition of *Psychiatric Genetics and Genomics*, edited by McGuffin et al. and published by Oxford University Press, is the best available resource for revising genetics for MRCPsych Paper 2 currently. For newer data, one must regularly skim through *Archives of General Psychiatry* and other such journals.

MRCPsych exam Paper 2 revision techniques in summary

1. Always stick to the standard textbooks you have read earlier. But remember textbooks are not written with the aim of helping trainees pass MRCPsych exams. So avoid spending too much time on irrelevant details.
2. As there is no bank of questions from previous papers for candidates to revise and attempt the exam confidently, one should get the basic concepts straight and correct, in order to tackle any surprises!
3. Group study helps in many ways; but make sure your peers are motivated to fully participate in the group.
4. Plan, plan, and plan! Structure your time according to the syllabus you have to revise. Spend equal time updating your knowledge from journals and solving MCQs.
5. There is no harm in utilizing all available materials before you attempt your exam—ask your senior ST trainees or colleagues and seek resources from revision courses and local MRCPsych teaching lectures.

APPROACH TO MULTIPLE CHOICE QUESTIONS^{3,4}

The MRCPsych exam is more than reading and understanding the core subject. It has also to do with the technique of attempting best- of- five MCQs. Unlike the old-style ISQ, the new style is a bit more difficult to do because the chance of getting the answer wrong is 80% compared to 50% with the older style. The very concept of selecting the best answer lies in the fact that there may be more than one right answer, but we need to choose the best answer. In order to do this, you get 180 minutes to answer 200 questions, that is less than 1 minute to answer a question. This means that the more familiar you are with the concepts, the faster you can answer and you will be able to spend more time on the more difficult and longer questions. It is said that in most medical examinations, candidates who answer half the questions correctly would score around the 50th or 60th percentile. A score of 65% (130/200) would place the examinee above the 80th percentile, whereas a score of 30% (60/200) would rank him or her below the 15th percentile. Test performance will always be influenced by your test- taking skills. Considering various test- taking strategies, and developing and perfecting them well in advance of the test date can help you concentrate better on the test itself. We recommend you try various techniques to find what works best for you. It should, in the end, help you to:

- increase your reading pace;
- focus on the most relevant information;
- eliminate as many options as possible when you are not sure of the correct answer.

You require enough practice using the techniques so that it becomes second nature and you don't concentrate on anything but how to choose the correct answer when you actually sit the exam.

Timing

Time management is an important skill for exam success. As mentioned above, the test has 200 questions to be answered in 3 hours, which leaves about 54 seconds per question. Each time you spend more than 54 seconds on a single question, time should be made up on other questions. Therefore it is essential to practise answering questions within a time limit to avoid pacing errors in the exam. This is where attempting a number of mock exams will help.

Approaching each question

There are several established techniques for tackling multiple choice questions which will help you in finding the single best answer choice. One of these is classifying each question as easy, workable, or impossible. The basic aim in doing this is to

- answer all easy questions;
- figure out the answer to all the workable questions in a reasonable amount of time;
- make fast and intelligent guesses on the impossible ones.

Another technique is to read the answer choices first along with the last sentence of the question before reading through the question quickly, so as to extract the most relevant information as well as to consider each of the answer possibilities in the context of the question. This is especially relevant when the question stem is large, for example a case scenario.

Elimination is one of the best tools that can be used in a single best answer multiple choice exam. Excluding the possibility of one answer choice proportionately increases the probability of choosing the right answer.

Since this is a paper and pencil exam, it is better to answer the questions in order, one by one; this reduces the chance of skipping and accidentally marking the wrong question or skipping an item. To avoid these ‘frame-shift’ errors, answer difficult questions with your best guess, mark them for review, move on and come back to them if you have time at the end.

Random guessing

- There are no negative marks for wrong answers, so no question should be left unanswered.
- A hunch is probably better than a random guess; we also suggest selecting a choice which you recognize over another which is totally unfamiliar to you.
- It is never beneficial to pick random choices unless you are grossly out of time and not answering all the questions, in which case the best bet would be to select a single letter like ‘C’ and marking the remaining questions with it. It is obvious that in this case the chance of picking the correct answer decreases with more answer choices. It is also believed that MCQ makers prefer to hide the answers either in C or D, the middle-most choices, more often than in the periphery. (However, it should be noted that the college is trying to get rid of this bias by presenting the multiple choices in alphabetical order.)
- It is also very important to not randomly guess the answers during your study and review sessions as well as the practice test sessions, as it may increase the tendency to do the same for the exam.
- As mentioned before, it is essential to take as many practice tests as possible to try the various techniques and select the ones that give you the best results.
- Use any extra time you might have to recheck your answers. Do not be casual in your review or you may overlook serious mistakes.
- Never give up. If you begin to feel frustrated try taking a 30-second breather. Remember your goals and keep in mind the effort and time you have spent in preparing for the exam compared with the small additional effort you will need to keep your focus and concentration throughout the exam.

Other things to do before the exam

Make arrangements for study leaves as early as possible. It is also important to find out how much private study leave you are entitled to. Make all the necessary swaps on the on call rota. Some deaneries arrange for stay and transport for the exam if there are a number of candidates taking the exam. Application forms should be sent well in time. If there are queries regarding applications, they should be clarified with the college at the earliest.

The day prior to exam, choose a good place to stay near the centre, even if it is expensive. As usual, it is important to get a good night's sleep. A good preparation should make you feel confident.

BOF MCQ exam techniques in summary

1. People who fail in MCQ exams do so not because they don't know the answer for some questions; it is because they think they know the answer and keep thinking about one question for 5 minutes or so, losing the remaining time to answer the rest.
2. All questions carry one mark only, no matter how easy or difficult each one is. So why spend all your time on 'difficult' ones?
3. In large, clinical vignette type of questions you may have many irrelevant details; at the same time you may also have valuable clues to solve the BOF. It is useful to read the last sentence of the question quickly, before reading the large vignettes fully.
4. People have different styles of approaching BOF. Exclusion technique needs more time than direct answer picking; if your style is one of exclusion, make sure you practise well enough to carry this out faster during the exam.

AFTER THE EXAM

If you have some stamina left at the end of this huge ordeal, it is not a bad idea to start recollecting the questions to form a question bank which will be useful for future candidates. It is best to recollect the questions in the company of a couple of colleagues. It will be a good idea to get the questions back to the college tutor and this will help to arrange further teaching. This will also help you to prepare for Paper 3 in the future.

READING LIST

Reference books and core clinical psychiatry

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¹ <http://rcpsych.ac.uk/PDF/Exams%20Eligibility%20July%202008.pdf>

² <http://rcpsych.ac.uk/exams/about/mrcpsychpaperii.aspx>

³ Bhushan V and Le T. *First Aid for the USMLE Step 1*, 16th edn. McGraw Hill Higher Education, 2006.

⁴ Stein M and Hwang G. *Cracking the Boards: USMLE Step 1*, 3rd edn. Princeton Review Series, 2000.

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1. It has been demonstrated that the levels of monoamine metabolites in CSF varies with polymorphism of serotonin transporter protein. Which of the following components of genetic apparatus is responsible for such polymorphisms?
 - A. Non-coding sequences
 - B. RNA
 - C. Exons
 - D. Ribosomes
 - E. Chromosomal count
2. In the diagnosis of HIV, following a positive ELISA test, western blotting could be used to confirm the diagnosis. Which of the following cellular components is separated by electrophoresis for western blotting?
 - A. Proteins
 - B. RNA
 - C. DNA
 - D. Cell membrane lipids
 - E. Free amino acids
3. Genetic information in an organism is inherited equally from parents of both sexes. An exception to this is seen in
 - A. Ribosomal RNA
 - B. Small arms of chromosomes
 - C. Mitochondrial DNA
 - D. Coding sequences of nuclear DNA
 - E. Non-coding sequences of nuclear DNA
4. Microtubule-associated protein tau undergoes several post-translational modifications and aggregates into paired helical filaments in Alzheimer's disease. These modifications of tau include all of the following except
 - A. Hyperphosphorylation
 - B. Protein glycosylation
 - C. Ubiquitination
 - D. Polyamination
 - E. Amino acid activation

- 5. Which one of the following refers to the synthesis of RNA molecules from DNA?**
- A. Replication
 - B. Translation
 - C. Transcription
 - D. Splicing
 - E. Modification
- 6. Newly synthesized RNA molecules undergo splicing to produce mRNA. Which one of the following best describes the process of splicing?**
- A. Introns are removed, exons are joined together.
 - B. Introns and exons are randomly spliced and pasted.
 - C. Both introns and exons are spliced out to make the RNA compact.
 - D. Splicing takes place in cytoplasm.
 - E. Splicing is a reversible process.
- 7. Which one of the following stages of the cell cycle is dominant in non-dividing cells such as neurones?**
- A. Synthetic phase (S)
 - B. Gap phase 1 (G1)
 - C. Gap phase 0 (G0)
 - D. Gap phase 2 (G2)
 - E. Mitotic phase (M)
- 8. Which one of the following nitrogenous bases is present in RNA but not DNA?**
- A. Adenine
 - B. Guanine
 - C. Cytosine
 - D. Thymidine
 - E. Uracil
- 9. Gene cloning is the process of insertion of foreign DNA into a replicating sequence such as a plasmid. Which of the following is essential for successful cloning?**
- A. Restriction enzyme
 - B. Actively meiotic cell
 - C. RNA ligase
 - D. Stem cell
 - E. Ovum

- 10. Polymerase chain reaction (PCR) was used in a study to search for various viruses in hippocampal tissue and CSF of patients with schizophrenia. PCR is the preferred method for the above study due to which of the following properties?**
- A. A small sample of DNA is sufficient to be detected by PCR.
 - B. PCR is useful even if viral sequences are not known previously.
 - C. PCR is not altered by contamination from other viruses in the lab.
 - D. Each amplification procedure using PCR can be completed within a few months.
 - E. The DNA replication process using PCR is relatively error free.
- 11. In a child with flat occiput, Brushfield spots, and simian palmar creases, the most common cause of death is**
- A. Cardiac failure
 - B. Leukaemia
 - C. Hypothyroidism
 - D. Suicide
 - E. Accidental injury
- 12. A child with low-set ears, polydactyly, and coloboma of the iris is diagnosed to have Patau's syndrome. Which of the following chromosomal aberrations explains this presentation?**
- A. Meiotic non-disjunction
 - B. Mitotic non-disjunction
 - C. Reduplication of chromosome 13
 - D. Amplification of the long arm of chromosome 18
 - E. Partial deletion of chromosome 18
- 13. Heritability is often used to express the genetic contribution in a multifactorial disease. Which of the following best describes heritability?**
- A. It refers to the share of genes contributing to a phenotype in an individual patient.
 - B. Heritability is disease specific and is always a fixed measure for a population.
 - C. Zero heritability excludes the possibility of finding a genetic locus underlying causation.
 - D. Identification of a genetic locus is necessary to estimate heritability.
 - E. Heritability cannot be measured for polygenic disorders.
- 14. The risk of severe affective disorder in relatives of probands with bipolar affective disorder is**
- A. 40%
 - B. 55%
 - C. 78%
 - D. 19%
 - E. 5%

15. Which of the following chromosomal abnormalities results in a phenotype with a cat-like cry and facial dysmorphism?

- A. Partial deletion chromosome 5
- B. Partial deletion chromosome 15
- C. Trisomy chromosome 5
- D. Trisomy chromosome 15
- E. Non-disjunction chromosome 1

16. Which of the following polymorphism has been linked to performance on working memory tasks in patients with schizophrenia?

- A. MAO-A polymorphism
- B. COMT polymorphism
- C. 5-HT transporter promoter region
- D. Apolipoprotein E polymorphism
- E. MAO-B polymorphism

17. Which one of the following processes can inactivate a gene?

- A. Methylation
- B. Crossing over
- C. Uncoiling of a chromosome
- D. Unwinding of DNA strands
- E. Condensation

18. Expression of genes depending upon the parent of origin is a phenomenon seen in

- A. Genomic imprinting
- B. Genetic anticipation
- C. Genetic amplification
- D. Autosomal aneuploidy
- E. Fragmented penetrance

19. Which of the following clinical scenarios is most likely to be a result of genetic anticipation?

- A. Advanced maternal age increases the risk of Down's syndrome.
- B. Mitochondrial disorders are transmitted only from mothers.
- C. Successive generations display the phenotype of Huntington's chorea at an earlier age.
- D. An autosomal recessive disorder presents with a mild dysfunction in heterozygous individuals.
- E. Male fetuses with one copy of a mutant X chromosome often die *in utero*.

20. A large pedigree is observed for the occurrence of a rare form of recurrent strokes. All affected females in the pedigree produce affected children of both sexes. But none of the affected males pass the disease on to the next generation. The most likely mode of inheritance is

- A. X-linked dominant
- B. X-linked recessive
- C. Mitochondrial
- D. Autosomal recessive
- E. Spontaneous mutations

21. Which of the following conditions will produce more than one Barr body in cells of affected patients?

- A. Testicular feminization syndrome
- B. Sexual infantilism due to Turner's syndrome
- C. Bilateral gynaecomastia due to Klinefelter's syndrome (47 XXY)
- D. Triple-X syndrome with normal fertility
- E. Fragile-X syndrome

22. Mrs Smith is a 32-year-old woman with normal IQ scores whose son has been recently diagnosed to have fragile-X syndrome. There is no family history of fragile-X syndrome in her husband's lineage, but Mrs Smith's maternal uncle had mental retardation, suspected to be fragile X retrospectively. Which of the following best describes Mrs Smith's genotype?

- A. She has a premutation.
- B. She has a complete mutation which is unexpressed.
- C. She is completely normal in terms of her genotype.
- D. She does not have a mutation due to variable penetrance of fragile-X syndrome.
- E. She has a fragile-X chromosome whose expression will occur only after age 40.

23. If a mother has alleles 'pp' while a father has alleles 'Pp' at the same locus, then which of the following distributions can be expected in the next generation?

- A. 1/2 Pp, 1/2 pp
- B. 1/3 Pp, 2/3 pp
- C. 1/2 PP, 1/2 pp
- D. 1/2 Pp, 1/2 PP
- E. 1/4 Pp, 3/4 pp

- 24. Which of the following genetic abnormalities is associated with rocker bottom feet, protrusion of bowel through the umbilical cord, and low-set ears in a male child, newly born to both healthy parents with no history of genetic disorders in the family?**
- A. Deletion
 - B. Insertion
 - C. Nonsense mutation
 - D. Translocation
 - E. Aneuploidy
- 25. Which of the following genetic mechanisms can explain the occurrence of Angelman's syndrome?**
- A. Maternal disomy of chromosome 15
 - B. Paternal disomy of chromosome 15
 - C. Spontaneous deletion of one copy of an allele at a certain locus, derived from the father
 - D. Spontaneous deletion of both copies of alleles from the father and mother
 - E. All of the above
- 26. If p is the frequency of allele A and q is the frequency of allele B of the same gene, then the frequency of the heterozygous combination AB is**
- A. p^2
 - B. q^2
 - C. pq
 - D. 2pq
 - E. 4pq
- 27. The criteria for defining a trait as endophenotype include all of the following except**
- A. Association with a candidate gene.
 - B. Cosegregation with increased relative risk of the trait in relatives.
 - C. The expression is dependent on the clinical state of the patient.
 - D. The endophenotype is more common in the patient's relatives than the general population.
 - E. The trait and disease have a biologically plausible association.
- 28. The fusion of two different chromosomes at a common centromere results from which of the following?**
- A. Robertsonian translocation
 - B. Reciprocal translocation
 - C. Inversion
 - D. Duplication
 - E. Iso-chromosome formation

29. Which of the following best describes multifactorial diseases?

- A. Diseases caused by multiple environmental factors
- B. Diseases caused by multiple genetic factors
- C. Disease caused by non-genetic, non-environmental causes
- D. Diseases caused by the interaction of multiple genes and environmental factors
- E. None of the above

30. A husband and wife are both affected by an autosomal dominant disorder with 75% penetrance. Provided that they are both heterozygous for the mutation, what will be the influence of this less than 100% penetrance rate on the likelihood that their children will be affected?

- A. Likelihood of having unaffected offspring remains unchanged
- B. Likelihood of having unaffected offspring increases
- C. Likelihood of having unaffected offspring decreases
- D. Likelihood of having unaffected offspring depends on the sex of the offspring
- E. Likelihood of having unaffected offspring depends on the birth order of the offspring

31. Which one of the following statement is false with respect to Mendelian inheritance?

- A. The law of independent assortment is a Mendelian principle.
- B. Segregation of genetic traits is explained by Mendelian principles.
- C. Mendelian principles are based on continuous variables.
- D. Mendelian principles are applicable to human genetics.
- E. The law of uniformity is a Mendelian principle.

32. Which of the following patterns of inheritance can skip generations and can affect individuals with unaffected parents?

- A. Autosomal dominant with complete penetrance
- B. Autosomal recessive
- C. X-linked dominant
- D. Mitochondrial inheritance
- E. None of the above

33. Which one of the following best describes a substitution mutation?

- A. It is a frame-shift mutation.
- B. It is a point mutation.
- C. It results in the replacement of a random sequence of bases.
- D. It is often a nonsense mutation.
- E. Substitution occurs only in coding regions of DNA.

34. Fragile sites present in human chromosomes are demonstrated using deprivation of which one of the following components used in DNA synthesis?

- A. Thymidine
- B. Uric acid
- C. Thiamine
- D. Iron
- E. Magnesium

35. Which of the following is not an established candidate endophenotype for schizophrenia?

- A. Prepulse inhibition
- B. P50 suppression
- C. Corrective eye saccades
- D. Working memory capacity
- E. Duration of untreated psychosis

36. The existence of two or more different chromosomal sites where mutations result in the same clinical expression is called

- A. Allelic heterogeneity
- B. Locus heterogeneity
- C. Pleiotropy
- D. Variable penetration
- E. Variable expression

37. Which of the following factors is often corrected for when ascertaining probands and unaffected relatives for family genetic studies?

- A. Age of onset of the illness
- B. Severity of the illness
- C. Duration of the illness
- D. Birth order of affected probands
- E. All of the above

38. A researcher studying the genetic explanation for delusional disorder detects genes at two different loci in the sample studied. One gene modifies the expression of the other in producing the delusional disorder phenotype. This phenomenon is called

- A. Epistasis
- B. Variable expression
- C. Incomplete penetrance
- D. Haplotype expression
- E. Codominance

39. The population distribution curve of a multifactorial trait is such that when it crosses a threshold disease becomes manifest. A similar distribution curve for relatives of affected individuals will be

- A. Shifted to the right
- B. Narrower in size
- C. Broader in size
- D. Shifted to the left
- E. Taller peak

40. In spite of accumulating evidence for the role played by genetic factors in various psychiatric illnesses, this is not translated to clinical genetic approaches in psychiatry. This paucity is most probably related to

- A. The magnitude of gene–illness association has an odds ratios around 20 to 50 for most psychiatric disorders.
- B. Associations between genes and phenotypes are less specific in psychiatry.
- C. Gene–disorder association is not contingent on environment in psychiatry.
- D. The causal chain from genes to psychiatric disorders is too short to be explored in detail.
- E. All of the above.

41. A 40-year-old Caucasian lady presents with depression. Which one of the following genotypes will be associated with better treatment response to SSRIs?

- A. Long/ long polymorphism in promoter region of the serotonin transporter gene
- B. Short/ short polymorphism in the coding region of the serotonin transporter gene
- C. Long/ long polymorphism in the coding region of the serotonin transporter gene
- D. Long/ long polymorphism in the coding region of the 5-HT_{2A} receptor
- E. None of the above

42. A child suffers from moderate learning disability, facial rash, and renal and lung cysts. He has coffee-coloured patches on his skin with intractable seizures. The mode of inheritance of this disease is

- A. X-linked dominant
- B. X-linked recessive
- C. Autosomal dominant
- D. Autosomal recessive
- E. Chromosomal translocation

43. A 21-year-old man with mental retardation and features of autism, enlarged external ears, and protruding jaw is most likely to show which of the following genetic abnormalities?

- A. CGG repeats
- B. CAG repeats
- C. XY repeats
- D. GAG repeats
- E. AAT repeats

- 44. The existence of two or more different mutant alleles at the same locus, resulting in varied clinical expression is called**
- A. Allelic heterogeneity
 - B. Locus heterogeneity
 - C. Pleiotropy
 - D. Variable penetration
 - E. Variable expression
- 45. Which of the following describes the phenomenon that the same gene has two or more different effects?**
- A. Allelic heterogeneity
 - B. Locus heterogeneity
 - C. Pleiotropy
 - D. Variable penetration
 - E. Variable expression
- 46. A mutation where insertion or deletion of a base pair results in mistranslation of the genetic code beyond that point is called a**
- A. Frame-shift mutation
 - B. Silent mutation
 - C. Nonsense mutation
 - D. In-frame mutation
 - E. Point mutation
- 47. Which of the following genetic analyses studies the departure from independent segregation?**
- A. Restriction fragment length polymorphism
 - B. Linkage analysis
 - C. Adoption studies
 - D. Fluorescent *in situ* hybridization
 - E. Twin studies
- 48. In genetic linkage studies, the LOD score above which linkage is conventionally thought to be significant is**
- A. 10
 - B. 5
 - C. 100
 - D. 3
 - E. 2

49. In linkage analysis, LOD scores are used. Which of the following best describes the LOD score?

- A. It is the log of the ratio of the likelihood of a specific recombination fraction to the likelihood that the recombination fraction is 1.
- B. It is the log of the ratio of the likelihood of the recombination fraction being 1 to the likelihood of a different specific recombination fraction.
- C. It is the log of the ratio of the likelihood of a specific recombination fraction to the likelihood that the recombination fraction is 1/2.
- D. It is the log of the ratio of the likelihood of a specific recombination fraction to the likelihood that the recombination fraction is zero.
- E. It is the log of the ratio of the likelihood of a specific recombination fraction to the likelihood that the recombination fraction is log of 1.

50. Two possible alleles of a gene are A and B. The genotype is distributed as AA, AB, and BB in the population. In a sample of 100 people, if the genotype frequency of AA is 40, AB is 54, and BB is 6, then the frequency of allele B is

- A. 60
- B. 12
- C. 66
- D. 33
- E. 120

51. A phenotypically indistinguishable disorder occurring in the absence of the genotype is called

- A. Phenocopy
- B. Pleiotropy
- C. Heterogeneity
- D. Genocopy
- E. None of the above

52. Considering the Hardy–Weinberg equation in population genetics, which of the following assumptions are made?

- A. No inbreeding in the population
- B. No migration in the population
- C. No mutation in the population
- D. No selection against a phenotype
- E. All of the above

53. RNA is synthesized from DNA in most the normal circumstances. Which of the following enzymes catalyses the synthesis of DNA from RNA?

- A. DNA ligase
- B. RNA polymerase
- C. Reverse transcriptase
- D. Primase
- E. DNA polymerase I

54. Equatorial alignment of chromosomes takes place in which of the following stages of mitosis?

- A. Prophase
- B. Anaphase
- C. Metaphase
- D. Telophase
- E. Interphase

55. Condensation of chromatin material, resulting in the production of sister chromatids, takes place in

- A. Prophase
- B. Anaphase
- C. Metaphase
- D. Telophase
- E. Interphase

56. According to the Hardy–Weinberg law, if a population has 1 in 1600 of its members affected by a homozygous recessive disorder, how many members will be heterozygous carriers?

- A. 1 in 40
- B. 39 in 40
- C. 1 in 80
- D. 1 in 20
- E. 1 in 4800

57. Nucleic acids constitute the chemical base of genes. Which of the following is not a component of nucleic acids?

- A. Pentose sugar
- B. Phosphate groups
- C. Purines
- D. Pyrimidines
- E. Arachidonic acid

- 58. Which of the following genetic studies compares the frequency of a marker in groups of patients versus unrelated controls?**
- A. Association study
 - B. Linkage study
 - C. Family study
 - D. Adoption study
 - E. Ecological study
- 59. In genetic twin studies, pair-wise concordance differs from proband-wise concordance in that**
- A. Pair-wise concordance calculates the total number of concordant affected pairs.
 - B. Pair-wise concordance calculates the total number of affected individual cotwins.
 - C. Proband-wise concordance can not be assessed in multifactorial disorders.
 - D. Proband-wise concordance is useful only in dizygotes.
 - E. All of the above.
- 60. The ratio of clinically affected to unaffected offspring for an autosomal recessive disorder where both parents are carriers is**
- A. 1 : 1
 - B. 1 : 3
 - C. 3 : 1
 - D. 2 : 1
 - E. 1 : 2
- 61. Variation in the expected gene frequency in a population can be explained using all of the following except**
- A. Gene drift
 - B. Gene flow
 - C. Natural selection
 - D. Spontaneous mutation
 - E. Increased death rate
- 62. A study finds that monozygotic concordance of intelligence is 0.86 while dizygotic concordance is 0.61. The heritability of intelligence is given by**
- A. 0.5
 - B. 0.25
 - C. 0.025
 - D. 0.07
 - E. 1.131

63. All of the following show non-Mendelian inheritance except

- A. Leber's optic neuropathy
- B. Huntington's disease
- C. Angelman's syndrome
- D. Prader–Willi syndrome
- E. Cystic fibrosis

64. Which one of the following methods is used in the determination of environment versus genetic contribution to a phenotype?

- A. Angoff method
- B. Receiver operator curve
- C. Path analysis
- D. Bonferroni method
- E. Diffusion method

65. The proportion of the total phenotypic variance accounted for by additive gene effects is called

- A. Broad heritability
- B. Narrow heritability
- C. Concordance
- D. Genetic determination
- E. Gene–environment covariance

66. Mutations on chromosome 17 are linked to which of the following neurodegenerative disorders?

- A. Huntington's disease
- B. Lewy body dementia
- C. Frontotemporal dementia
- D. Alzheimer's dementia
- E. Crutfeld–Jakob disease

67. A 24-year-old man suffers from repeated episodes of sleepiness associated with sudden falls. Which of the following polymorphisms is associated with this patient's condition?

- A. Dopamine D2 receptor polymorphism
- B. CYP2D6 polymorphism
- C. CYP3A4 polymorphism
- D. HLA DR2 polymorphism
- E. Serotonin transporter polymorphism

68. Which of the following genotypes has been shown to influence antisocial outcomes in maltreated children?

- A. Low COMT activity
- B. High MAO-B activity
- C. 5-HT transporter long variant
- D. High MAO-A activity
- E. DRD3 Ser9Gly polymorphism

69. Which of the following features predicts a good response to lithium treatment in bipolar patients with acute mania?

- A. Dysphoric mania
- B. Mixed episode of mania and depression
- C. Mania during a rapid cycling phase
- D. Classical mania without schizoaffective features
- E. Family history of bipolar disorder

70. A 13-year-old boy presents with slow and clumsy walking and difficulties in writing. On examination he has a slurred speech with high stepping and a wide-based gait. Deep tendon reflexes are absent and plantar responses are extensor bilaterally. Which of the following chromosomes is implicated in the aetiology?

- A. Chromosome 1
- B. Chromosome 14
- C. Chromosome 4
- D. Chromosome 7
- E. Chromosome 9

71. Family aggregation is an important source of evidence for psychiatric genetics. Which of the following is true with regard to genetic relatedness?

- A. A 25% decrement in risk across successive generations suggests an environmental contribution for the disease studied.
- B. First degree relatives share 75% of their genes.
- C. In multifactorial diseases >50% decrement in risk across successive generations is seen.
- D. The expression λ (lambda) refers to linkage disequilibrium.
- E. Second-degree relatives share 50% of their genes.

72. The proportion of phenotypic variation attributable to non-genetic causes among depressed patients is

- A. 30–40%
- B. 40–50%
- C. 90–95%
- D. 60–65%
- E. 10–20%

73. Which of the following is true regarding the APOE gene in Alzheimer's disease?

- A. APOE ε4 increases the risk of Alzheimer's disease in a dose-dependent fashion.
- B. APOE ε4 confers a protective effect against vascular dementia.
- C. APOE ε3 variant offers a protective effect against Alzheimer's dementia.
- D. The odds of Alzheimer's disease in subjects with one copy of APOE ε4 is 15 times higher.
- E. The frequency of APOE ε4 in the general population is extremely rare.

74. Which of the following genes implicated in schizophrenia potentially modulates D-amino acid oxidase?

- A. NRG1
- B. BDNF
- C. G72
- D. DISC1
- E. DMD (Dystrophin)

75. A transcriptome refers to

- A. All DNA in a cell
- B. All expressed mRNA in a cell
- C. All expressed tRNA in a cell
- D. All histones in a cell
- E. All introns in a cell

76. Which of the following statements comparing the genetics of simple Mendelian disorders and schizophrenia is true?

- A. Schizophrenia has higher monozygotic concordance.
- B. Phenocopies are probably more common in schizophrenia than in Mendelian disorders.
- C. Locus heterogeneity within families is very common in Mendelian disorders.
- D. Penetrance is almost always complete in schizophrenia.
- E. Mendelian disorders always present in childhood.

77. The term copy number variation refers to

- A. Differences in the number of copies of certain genes per genome
- B. Differences in the total number of genes in a genome
- C. Differences in genetic code between two normal parents of a diseased child
- D. Variations in single nucleotides of a functional genetic code
- E. Variations in length of promoter regions of certain transcription factors

78. From the following, chose the correct combination of trinucleotide repeats and fragile-X syndrome genotype.

- A. 6 to 60 CGG repeats: premutation
- B. 61 to 200 CAG repeats: mutation
- C. 2 to 20 CGG repeats: permutation
- D. >200 CGG repeats: full mutation
- E. >49 CCG repeats: full mutation

79. Which of the following statements regarding genetic testing for Huntington's disease is true?

- A. Genetic testing cannot predict the probable age of onset of symptoms.
- B. Direct identification of the trinucleotide repeats is not possible using currently available genetic tests.
- C. Prenatal testing is not possible for a fetus of non-affected parents.
- D. The disease does not occur in those with no positive family history of Huntington's disease.
- E. Homozygotes are more severely affected than heterozygotes.

80. A 12-year-old boy presents with clinical features consistent with hyperkinetic disorder with conduct problems. On examination, he has an abnormal spinal curvature. Psychometric testing reveals deficits in linguistic and visuospatial skills with borderline IQ. His younger brother has multiple, light-brown spots on his face. Which of the following is the likely mode of inheritance?

- A. Autosomal dominant
- B. Autosomal recessive
- C. Trinucleotide expansion
- D. X-linked recessive
- E. X-linked dominant

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chapter
1

PSYCHIATRIC GENETICS

ANSWERS

1.A. Polymorphism refers to variations in the genome at a particular locus noted in a general, apparently healthy population. Polymorphisms occur at a fairly high frequency in the general population. When the polymorphism occurs in more than 1% of a population, it can be considered as useful for genetic linkage analysis. ABO blood groups are a good example of polymorphism expressed in the protein products of genes. Restriction fragment length polymorphisms are those variations that create or destroy the sites at which restriction enzymes act on a DNA molecule, rendering differences in the final 'restricted' or cleaved DNA when these enzymes are applied *in vitro*. If these polymorphisms are due to changes in a single nucleotide in a sequence, they are called SNPs or single nucleotide polymorphisms. SNPs seem to be one of the most common genetic variations and various SNP genotyping methods are being increasingly employed to study polymorphisms. Polymorphisms arise originally out of mutations but are maintained in populations due to factors such as founder effect, genetic drift, and natural selection. Note that most polymorphisms occur in non-coding regions (that is introns), as coding sequences (or exons) on mutation often produce disease phenotypes. Serotonin transporter polymorphisms have been identified in the promoter region, which is a non-coding part of DNA (5HTTLPR–5HT transporter linked promoter region). 5HTTLPR can be a short or long variant. In those with a short variant, the serotonin transporter expression is low; the short variant is speculated to be associated with a higher incidence of affective disorders, anxiety, and PTSD. But the evidence is inconclusive as most studies are case–control design with significant heterogeneity. In addition, structural brain changes in the form of gray matter volume reduction in areas important for emotional processing, such as the amygdala, have been noted in subjects with the short variant of the promoter region.

An altered number of chromosomes is termed aneuploidy.

Kato T. Molecular genetics of bipolar disorder and depression. *Psychiatry and Clinical Neurosciences* 2007; **61**: 3–19.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2005, p. 260.

2.A. Molecular analysis techniques include Southern, northern, and western blotting. Western blotting is used in protein analysis, for example to detect HIV antibodies. Northern blotting is used in RNA analysis, while Southern blotting is used in the analysis of DNA. Southern blotting was named after its founder, Professor Edwin Southern; the other names were given to differentiate among the various blotting techniques.

Hayes PC et al. Blotting techniques for the study of DNA, RNA, and proteins. *British Medical Journal* 1989; **299**: 965–968.

3.C. Mitochondrial DNA is wholly inherited from the ovum. The sperm has no mitochondria in its 'head'; the 'head' is made of nuclear material and the acrosomal cap. The 'body' of sperm have many mitochondria which provide energy to propel the 'tail'. The 'body' and 'tail' are shed on entry of sperm into the ovum. Hence the mitochondria of an embryo are completely maternally derived. This is important in clinical genetics as mitochondrial DNA abnormalities result in various diseases, such as MELAS (mitochondrial myopathy, encephalopathy, lactic acidosis, and recurrent stroke syndrome) and Leber hereditary optic neuropathy. These diseases are purely maternally inherited. Mitochondrial DNA codes for 13 proteins involved in the respiratory chain in addition to 22 tRNAs and two ribosomal RNAs.

Leonard JV and Shapira AHV. Mitochondrial respiratory chain disorders I: mitochondrial DNA defects. *Lancet* 2000; **355**: 299–304.

4.E. Amino acid activation is an important step in the translation of mRNA to proteins. As tRNAs enter the cytoplasm after release from the nucleus where they are synthesized, they are attached to specific amino acids according to the codon sequences. This is an energy-dependent process called amino acid activation. The energy stored in such activated amino acids is used in making peptide bonds during protein translation. Translation takes place in the cytoplasm on ribosomes, where specific mRNAs are involved. Translation includes three steps—initiation, elongation, and termination. The ribosome contains two sites—peptidyl P site where methionine-containing tRNA initially binds and aminoacyl A site where each new incoming tRNAs with activated amino acids can bind. In the elongation step amino acids are added one by one in a string-like fashion to produce proteins. Chain termination is signalled by one of three codons—UAA, UGA, or UAG. Following this protein synthesis (or sometimes simultaneously at one end of long proteins), post-translational modifications take place to transport the synthesized proteins to appropriate cellular sites. These modifications take place in endoplasmic reticulum and golgi bodies. This includes covalent modifications, protein folding, and tagging with signal peptides to dispatch to appropriate cellular destinations. Glycosylation, proteolysis, phosphorylation, gamma carboxylation, prenylation, ubiquitination, polyamination, and nitration are some of the recognized post-translational modifications. This process is essential in tagging wrongly folded or aberrant proteins to enter lysosomes for destruction.

Gong CX et al. Post-translational modifications of tau protein in Alzheimer's disease. *Journal of Neural Transmission* 2005; **112**: 813–838.

5.C. Transcription refers to the synthesis of RNA from DNA. Translation refers to the production of proteins from RNA. Replication refers to the production of new DNA copies from template copies of DNA. Splicing refers to the removal of non-coding sequences of RNA following transcription. DNA contains both coding and non-coding sequences. To synthesize proteins, the code contained in exons (coding sequences) are required. The heterogeneous nuclear RNA, which contains both coding exons and non-coding introns, undergoes splicing by spliceosomes within the nucleus to produce mature mRNA. Modification refers to the post-translational changes in a protein molecule before it becomes functionally active.

McGuffin P et al., eds. *Psychiatric Genetics and Genomics*. Oxford University Press, 2002, pp. 10–12.

6.A. In splicing, the non-coding introns (intervening codons) are removed and exons are pasted together, producing a compact mRNA. This takes place in the nucleus. The splicing is carried out by small nuclear RNAs and protein complexes, which together constitute spliceosomes. This is an irreversible process as normally hnRNAs (heterogeneous nuclear RNAs) cannot be reassembled from mRNAs.

McGuffin P et al., eds. *Psychiatric Genetics and Genomics*. Oxford University Press, 2002, p. 11.

7.C. Each cell undergoes a natural cycle in terms of its replication and nucleic acid synthesis activity. The cell cycle consists of four separate phases: G1, S, G2, and M. G1 stands for growth phase 1, S for synthetic phase, G2 for growth phase 2 and M for mitosis phase. In mitosis the cellular material, including chromosomes, is divided between two daughter cells. Cells can leave G1 phase to enter a G0 phase, also called the quiescent phase as no replicatory activity takes place here. Most of these cells have temporarily or reversibly stopped dividing, for example liver parenchyma, in which case they enter G1 phase on stimulation. Cells such as neurones enter G0 phase indefinitely, but note that this dogma of absolute neuronal cell cycle dormancy is increasingly being challenged. A number of neurodegenerative diseases in humans, such as Pick's disease, intractable temporal lobe epilepsy, progressive supranuclear palsy, Lewy body disease, and Parkinson's disease, are thought to be associated with a few neurones retaining the ability to re-enter mitosis, thus disrupting the normal cell cycle.

Collins K, Jacks T, and Pavletich NP. *The cell cycle and cancer. Proceedings of the National Academy of Sciences* 1997; **94**: 2776–2778.

Zhu X, Raina AK, and Smith MA. *Cell cycle events in neurons: Proliferation or death? American Journal of Pathology* 1999; **155**: 327–329.

8.E. DNA and RNA are the most important nucleic acids in the cellular machinery. These nucleic acids are composed of many nucleotides. Nucleotides are phosphorylated versions of nucleosides. Each nucleoside consists of two components: a nitrogenous base and a pentose sugar. There are two types of nitrogenous bases that can constitute a nucleoside—purines and pyrimidines. Purines include adenine and guanine. Pyrimidines include cytosine, uracil, and thymine. Thymine is usually found only in DNA while uracil is specific to RNA. DNA is double stranded with hydrogen-bonded base pairs. In DNA adenine always bonds with thymine (two hydrogen bonds) while cytosine bonds with guanine (three hydrogen bonds). As a result of this specific pairing, the amount of total purines is always equal to the total pyrimidines in normal DNA (Chargaff's rule).

McGuffin P et al., eds. *Psychiatric Genetics and Genomics*. Oxford University Press, 2002, p. 5.

9.A. Cloning is the process of copying; cloning laboratory animals refers to making identical genetic copies of the organisms while cloning a gene refers to producing identical copies of the gene. Gene cloning involves the insertion of foreign DNA into vectors such as bacterial plasmids or phages. Replication of these vectors then produces numerous identical copies of the cloned gene. In order to carry out successful cloning, a method of cutting DNA at specific sites to obtain the necessary genetic element is crucial. This is possible using restriction enzymes. DNA ligase (not RNA ligase) is used to paste the cut genetic element with plasmid DNA. A stem cell or ovum is not necessary for gene cloning. Active mitosis is sufficient to carry out cloning, thus meiosis is not necessary for gene cloning.

Kumar PJ and Clark ML. *Clinical Medicine*, 6th edn. Elsevier, 2006, p. 169.

10.A. PCR stands for polymerase chain reaction. It is an amplification process wherein a small amount of DNA sample is amplified many times to provide a supply for diagnostic analyses. The polymerization requires heat-stable DNA polymerase, obtained from *Thermus aquaticus*. Just one copy of a DNA sequence is sufficient to undertake PCR (at least theoretically). As it is extremely sensitive, contamination from other DNA present in the lab. environment (from bacteria, viruses, and DNA of lab. personnel) presents significant difficulties. As PCR requires the hybridization of primers to known sequences at either side of the region of interest (i.e. flanking regions), completely unknown sequences cannot be polymerized. DNA cloning by PCR can be performed in a few hours, using relatively unsophisticated equipment. Typically, a PCR reaction consists of 30 cycles containing a denaturation, synthesis and reannealing step, with an individual cycle typically taking 3–5 min in an automated thermal cycler. This compares favourably with the time required for cell-based DNA cloning, which may take weeks. PCR is not error free. The DNA polymerases used for PCR usually have no error correction mechanisms such as exonuclease activity. So, if an error is made, initially it may get amplified uncorrected, but this is less of a problem now with the availability of high-fidelity DNA polymerases.

McGuffin P et al., eds. *Psychiatric Genetics and Genomics*. Oxford University Press, 2002, pp. 21–22.

11.A. The presence of low, flat occiput, Brushfield spots, and simian palmar creases indicates Down's syndrome. The most common cause of death in children with Down's syndrome is cardiac failure. Though hypothyroidism is a common accompaniment, this is rarely fatal. Suicide is not a major cause of death in this group. In adults with Down's syndrome, most of whom obtain surgical correction for major cardiac anomalies at a younger age, leukaemia becomes a major killer.

Hermon C et al. for the Collaborative Study Group of Genetic Disorders. Mortality and cancer incidence in persons with Down's syndrome, their parents and siblings. *Annals of Human Genetics* 2001; **65**: 167–176.

12.A. Patau syndrome results from aneuploidy of chromosome 13 where three copies are found. This is due to non-disjunction of chromosome 13 during meiosis, mostly in the mother. Similar to Down's, Patau's syndrome is associated with increasing maternal age. Patau's syndrome may also occur as a result of random non-disjunction during early cell division, resulting in a mosaic cell population. Rarely, Patau's syndrome can result from a translocation that leaves the fetus with three copies of chromosome 13. This is often a balanced translocation where almost no significant clinical changes are seen in the carrier, but this can affect the children of the carrier. In non-translocation-related Patau's syndrome, the chance of a couple having another child with trisomy 13 is less than 1%. Most fetuses with trisomy 13 die *in utero*. If survived, the clinical features include mental retardation, microcephaly and holoprosencephaly, structural eye defects, and congenital cardiac anomalies.

Patau K et al. Multiple congenital anomaly caused by an extra autosome. *Lancet* 1960; **1**: 790–793.

13.C. Heritability is the proportion of variation in a trait that can be attributed to genetic factors. It does not apply to a specific trait in an individual patient; it refers to the variation in the population as a whole. It is not immutable for a specific disease in a population; it will vary with the epidemiological changes in risk and environmental influences in a population, but it can be fixed at a specific time and for a given set of circumstances. Heritability is related to the feasibility of finding a candidate gene for a disease or trait; if a disease has zero heritability in a population, there is no chance of finding a gene. But this does not mean that 'the higher the heritability, the greater the feasibility of locating the genetic cause'. Heritability can be measured for polygenic disorders even when candidate genes are not known.

The phenotypic variation seen in the general population for a particular trait, say height of a person, can be explained by:

1. Total environmental effects—includes both shared and non-shared environmental effects
2. Total genetic effects—includes both additive genetic effects and dominance effects.

Narrow-sense heritability refers to the proportion of total phenotypic variation that can be attributed to additive genetic variance. The proportion of the total phenotypic variation attributed to total genetic variance is called broad-sense heritability.

Kendler K. Psychiatric genetics: a methodologic critique. *American Journal of Psychiatry* 2005; **162**: 3–11.

14.D. The risk of severe affective disorder in first-degree relatives of probands with bipolar disorder is 19%. The average morbid risk of bipolar disorder itself is 8%, while unipolar depression is around 11% in the first-degree relatives of probands with a bipolar disorder. The risk of severe affective disorders in first-degree relatives of probands with unipolar depression is estimated to be around 10%. Note that the lifetime risk of severe affective illness is about 3 to 5% for unipolar and 1% for bipolar disorders in the general population.

Scourfield J and McGuffin P. Familial risks and genetic counselling for common psychiatric disorders. *Advances in Psychiatric Treatment* 1999; **5**: 39–45.

15.A. The clinical description in the question fits with cri-du-chat syndrome. This is a result of partial deletion of small arm of chromosome 5. Cri-du-chat syndrome was first described by a French paediatrician, Lejeune, in 1963; he coined the term 'cri-du-chat' (cry of the cat). The commonly associated clinical features of cri-du-chat syndrome are:

1. Cat-like cry
2. Dysmorphic facies
3. Profound global learning disability.

It is now recognized that this triad does not present in all patients. Restrictive language skills and severely delayed psychomotor development are other notable features.

Cornish K and Bramble B. Cri du chat syndrome: genotype–phenotype correlations and recommendations for clinical management. *Developmental Medicine and Child Neurology* 2002; **44**: 494–497.

16.B. COMT polymorphism has been widely studied in schizophrenia. COMT stands for catechol-*o*-methyl transferase. It is an important enzyme in the breakdown of dopamine in prefrontal area of the brain. Though monoamine oxidase is the major enzyme in dopamine metabolism in most other brain regions, COMT assumes special significance in the prefrontal brain area, at least in primates; the dopamine (reuptake) transporter is present at a low density in the prefrontal area compared to the striatum. The gene for COMT is located on chromosome 22q11. The deletion of 22q11 results in velo cardio facial syndrome (VCFS) or di George syndrome. As many as 30% of affected individuals with VCFS meet diagnostic criteria for schizophrenia. The existence of a valine-to-methionine (Val/Met) polymorphism has been noted, stimulating more interest in COMT. Val/Val genotype results in a higher activity form, while Met/Met is associated with lower activity of the enzyme. The higher activity variant leads to faster breakdown and reduced availability of prefrontal dopamine. This may be associated with poorer working memory function or inefficient prefrontal activity in such tasks.

Findings implicating GABA in working memory have been reported. Decreased expression of the GABA biosynthetic enzyme glutamic acid decarboxylase 67 (GAD67), encoded by *GAD1*, is found in the post-mortem brain tissue of schizophrenia patients. It has been shown that the variation in *GAD1* influences multiple domains of cognition, including declarative memory, attention, and working memory. There may be epistasis between SNPs in *COMT* and *GAD1*, suggesting a potential biological synergism, leading to increased risk. These coincident results implicate *GAD1* in the aetiology of schizophrenia and suggest that the mechanism involves altered cortical GABA inhibitory activity in addition to COMT changes (Straub et al. 2007).

Williams HJ et al. Is *COMT* a susceptibility gene for schizophrenia? *Schizophrenia Bulletin* 2007; **33**: 635–641.

Straub RE, Lipska BK, Egan MF et al. Allelic variation in *GAD1* (*GAD*₆₇) is associated with schizophrenia and influences cortical function and gene expression. *Molecular Psychiatry* 2007; **12**: 854–869.

17.A. Chemical modification of DNA is one method by which gene expression is controlled. This can be achieved by adding methyl groups to some of the amino acids in DNA. In females, randomly picked X chromosomes undergo methylation (Lyon's hypothesis) resulting in Barr bodies. In fragile-X syndrome, the fragile X site undergoes methylation, resulting in reduced expression of the *FMR1* gene on X chromosomes. This produces the phenotype of fragile-X syndrome. Unwinding of DNA is an important step that precedes DNA synthesis (replication from the template). Crossing over, condensation, and uncoiling are seen in the normal cell cycle. Genes do not become inactivated during such processes and subsequent cellular synthetic processes are intact.

Adams RLP. DNA methylation: The effect of minor bases on DNA-protein interactions. *Biochemical Journal* 1990; **265**: 309–320.

18.A. In genomic imprinting, the disease phenotype expressed depends on whether the allele is of maternal or paternal lineage. This parent-of-origin phenomenon is an important exception to Mendelian inheritance patterns. An often-quoted example is Angelman's syndrome and Prader–Willi syndrome. These are two clinically distinct, genetic diseases associated with genomic imprinting on chromosome 15q11-q13. Major diagnostic criteria for Prader–Willi syndrome include mental retardation, hypotonia, hyperphagia and obesity, hypogonadism, and maturational delay. In Angelman's syndrome ataxia, tremors, seizures, hyperactivity, and profound mental retardation are accompanied by outbreaks of laughter (gelastic attacks). Approximately 70% of patients with Prader–Willi syndrome have a deletion in their paternally derived 15q11-q13. Maternal uniparental disomy (inheriting both copies from the mother when the embryo is formed) occurs in most of the remaining patients (25%). Most patients with Angelman's syndrome have a deletion in their maternally derived 15q11-q13. Paternal uniparental disomy occurs in about 4% of Angelman's syndrome. This parent-of-origin effect is thought to be due to DNA methylation defects.

Genetic anticipation refers to the phenomenon wherein phenotypic expression of a mutation occurs earlier in successive generations. This is seen in Huntington's disease and other trinucleotide repeat diseases. Autosomal aneuploidy, such as Down's syndrome, are not 'inherited' diseases but show a correlation with maternal age, as an ageing ovum is prone to more cell division errors. This is not the same as the parent-of-origin effect.

Falls JG et al. Genomic imprinting: implications for human disease. *American Journal of Pathology* 1999; **154**: 635–647.

19.C. The anticipation phenomenon refers to an aspect of several genetic disorders in which the age at onset decreases and the severity of illness increases in successive generations. The classical example is Huntington's disease. This is also noted in other trinucleotide repeat syndromes. Trinucleotide repeats undergo expansion during germ cell division, which further destabilizes the mutant trinucleotide loci and the probability of the phenotypic expression thus increases with every gametogenesis. This occurs more frequently with oogenesis than spermatogenesis, leading to pronounced anticipation in maternally transmitted trinucleotide diseases. Carriers of a heterozygous recessive mutation may show cellular level abnormalities lifelong without overt disease manifestation; this is not genetic anticipation.

McGuffin P et al., eds. *Psychiatric Genetics and Genomics*. Oxford University Press, 2002, pp. 19–20.

20.C. This description refers to MELAS, which shows mitochondrial inheritance. In mitochondrial inheritance, the disease is transmitted from females to males but not from males to females. MELAS stands for mitochondrial myopathy, encephalopathy, lactic acidosis, and recurrent stroke. MELAS is a progressive neurodegenerative disorder. Patients may present with seizures, diabetes mellitus, hearing loss, short stature, and exercise intolerance.

Leonard JV and Shapira AHV. Mitochondrial respiratory chain disorders I: mitochondrial DNA defects. *Lancet* 2000; **355**: 299–304.

21.D. In testicular feminization syndrome, the karyotype is usually 46 XY. Due to insensitivity of androgen receptors, female sexual characteristics develop in such individuals. They will not have Barr bodies. In those with Kleinfelter's syndrome, the karyotype is usually 47 XXY. Here, the individuals will have one Barr body in spite of being phenotypical males. Patients with Turner's syndrome have no Barr bodies as they have only one X chromosome, in spite of being phenotypical females. Patients with triple-X syndrome show two Barr bodies in each cell. These individuals are also called metafemales. In fragile-X syndrome the number of Barr bodies will not be altered.

Barr ML and Bertram EG. A morphological distinction between neurones of the male and female, and the behaviour of the nucleolar satellite during accelerated nucleoprotein synthesis. *Nature* 1949; **163**: 676–677.

22.A. Premutation is a term used in trinucleotide repeat diseases to suggest that someone is harbouring the trinucleotide expansion but the expansion is not long enough to produce the disease. But premutants will produce further expansion of the loci during gametogenesis and thus their children will express the mutation if inherited. In this question the mother has no phenotypic expression, which is rare to occur after age 32. Her genotype cannot be normal as her uncle and son are both affected by fragile-X syndrome. Fragile-X syndrome has nearly complete penetration falsifying the fourth option.

Jacquemont S, Hagerman RJ, Leehey M et al. Fragile X premutation tremor/ataxia syndrome: molecular, clinical, and neuroimaging correlates. *American Journal of Human Genetics* 2003; **72**: 869–878.

23.A. The mother has genotype pp. Her gametes can both have p only. The father has Pp. His gametes may be either p or P. If these gametes combine in the children four possible combinations—pp, pp, pP, and pP—will be produced. Hence there will be 1/2 pp and 1/2 Pp variants in the children.

Kumar PJ and Clark ML. *Clinical Medicine*, 6th edn. Elsevier, 2006, p. 182.

24.E. This question refers to Edwards' syndrome, which is 18 trisomy. This is an aneuploidy. Euploidy refers to the presence of chromosomal numbers in multiples of 23. Haploid refers to the presence of 23 chromosomes, as normally seen in gametes. Most somatic cells are diploid, possessing 46 chromosomes. Aneuploidy refers to any aberrations in chromosomal numbers, for example monosomy, trisomy, etc. Edward's syndrome is characterized by 47XX +18 or 47XY +18 constitutions. It is seen in around 1 in 6000 live births; 90% of infants die in the first year of life. The common clinical features are small size, small mouth and low-set ears, clenched fist with overlapping fingers, congenital heart defects, and omphalocele.

Edwards JH, Harnden DG, Cameron AH et al. A new trisomic syndrome. *Lancet* 1960; **1**: 787–790.

25.B. Angelman's syndrome is an example of genomic imprinting. Deletion of maternally inherited 15q11-13 (70%) or uniparental disomy where both 15q11-13 come from the father (4%) leads to Angelman's syndrome. This is because certain genetic loci in 15q11-13 are selectively imprinted (that is inactivated via methylation) according to the parent of origin. When the maternally derived chromosome is absent due to deletion or paternal disomy this produces the phenotype. Similarly, maternally derived disomy or deletion of the paternally derived chromosome can produce Prader-Willi syndrome at the same locus.

McGuffin P et al., eds. *Psychiatric Genetics and Genomics*. Oxford University Press, 2002, p.17 and p. 20.

26.D. This question tests one's knowledge of the Hardy–Weinberg equilibrium. In a large population where random mating occurs between individuals, a constant and predictable relationship exists between various genotype and allele frequencies. If the frequency of an allele, A, is given by p , then at the same locus a second allele, B, has a frequency $q = 1 - p$. The frequency of AA individuals is given by $p \times p = p^2$. The frequency of BB is thus q^2 . The frequency of heterozygosity is given by $2pq$ as the heterozygosity can be AB or BA, both denoting the same constitution. According to the Hardy–Weinberg equilibrium $p^2 + 2pq + q^2 = 1$. This is true because $(p + q)^2 = (p + 1 - p)^2 = 1^2 = 1$. Note that deviations from the Hardy–Weinberg equilibrium can occur due to assortative non-random mating, natural selection, genetic drift, or gene flow.

McGuffin P et al., eds. *Psychiatric Genetics and Genomics*. Oxford University Press, 2002, p. 39.

27.C. An endophenotype is an unseen but measurable phenomenon that is present in the distal genotype to disease pathway. It can be a biochemical, neuroimaging, electrophysiological, pathological, neuropsychological, or sociofunctional marker. To be termed an endophenotype, Gottesman suggested certain criteria to be satisfied by an identified disease marker. These are as follows:

1. Must be associated with a candidate gene or region
2. Must be present with a high relative risk in relatives, thus co-segregating with the actual illness
3. Must be a parameter associated with the disease with biological plausibility
4. Must be expressed independently of clinical state (i.e. must not be a state but a trait marker)
5. Must be heritable
6. Must be present in relatives more often than the general population.

Gottesman II and Gould TD. The endophenotype concept in psychiatry: etymology and strategic intentions. *American Journal of Psychiatry* 2003; **160**: 636–645.

28.A. Reciprocal translocation refers to exchange of genetic material between two chromosomes. An individual who carries a reciprocal translocation will not be affected clinically as he or she will have the normal complement of all essential genetic material. However, the children of such an individual can inherit partial trisomy or partial monosomy of the translocated chromosomes. Robertsonian translocations occur in approximately 1 in 1000 individuals. This refers to the loss of short arms of two acrocentric chromosomes (which do not have much genetic material) and subsequent fusion of the two chromosomes at 'sticky' centromeres. Again there is no effect in the individuals who suffer such a translocation but their children can inherit the effects. Five per cent of Down's syndrome children have inherited a Robertsonian translocation between chromosome 14 and 21, leading to triple copies of chromosome 21. In a mother with a 14:21 translocation, the risk of subsequent children having Down's syndrome is elevated to 10–15%, irrespective of maternal age. The risk is around 1–2% if the father carries such a translocation. Note that in a mother less than 30 without a translocation who has given birth to a Down's syndrome baby, the chances of recurrence is only 1%. Inversion refers to a segment of chromosome between two breaks undergoing reinsertion into the same chromosome but in a reverse order. If these breaks occur on either side of a centromere, it is called pericentric inversion. If not, it is termed paracentric inversion. Duplication occurs during formation of chromatids, where more than two sister chromatids are created. Isochromosomes occur when chromosomes divide at a horizontal instead of vertical axis during cell division. Hence daughter chromatids will have two copies of the same arm of a chromosome. This is usually lethal for most chromosomes except the X chromosome, whose isochromosomes can result in Turner's syndrome in individuals who inherit isochromosome Xq (long arm). This indicates that most determinants of Turner's syndrome reside in the short arm of the X chromosome.

Kumar PJ and Clark ML. *Clinical Medicine*, 6th edn. Elsevier, 2006, p. 174.

29. D. Monogenic diseases follow single gene–single disease inheritance, as for example in phenylketonuria. However, the most common cause of genetic disorders is thought to be multifactorial or polygenic inheritance. Polygenic diseases are genetic disorders caused by mutations or changes in more than one genetic locus, for example neurofibromatosis can be caused by NF-1 or NF-2 mutations. When environmental factors also play a role in the development of a disease or trait, the term multifactorial is used to refer to the additive effects of many genetic and environmental factors. Multifactorial illnesses, for example diabetes, coronary heart disease, and possibly most psychiatric illnesses, are simultaneously influenced by multiple genes and by environmental factors.

Kumar PJ and Clark ML. *Clinical Medicine*, 6th edn. Elsevier, 2006, p. 173.

30. B. If both parents are heterozygous the chance that the child inherits an autosomal dominant disease is 3/4, that is 75% (out of four children, one may have both normal alleles, one may have both abnormal alleles, and two may have heterozygous make-up). With 75% penetrance, the chances of a child being affected reduces to 75% of the original chance. So $75\% \times 75\% =$ nearly 57% will be affected. This means that the likelihood of having an unaffected child increases from 25 to nearly 40%. Hence, the lower the penetrance, the higher the likelihood of having an unaffected child. This does not depend on the sex or birth order.

Kumar PJ and Clark ML. *Clinical Medicine*, 6th edn. Elsevier, 2006, p. 169.

31. C. Gregor Johann Mendel was a monk who was interested in horticulture and botany. He studied garden peas and proposed ‘laws’ of inheritance. The first law is the law of uniformity. According to this law, if two plants that differ in just one trait (black and white) are crossed, then the resulting hybrids will be uniform in the chosen trait (either black or white, not blue). This is not entirely true as later geneticists demonstrated intermediate phenotypes resulting from codominant heterozygous expression. The second law is the principle of segregation. It states that for any particular trait, the pair of alleles of each parent separate and only one allele passes from each parent to an offspring. Which allele in a parent’s pair of alleles is inherited is a matter of pure chance. For example if there are two alleles with one determining white colour and one determining black colour in the first generation, then these two alleles segregate and only one of them from each parent could be passed on to the second generation. This was later proved to be true by studying chromosomes during cell division. The third principle is the principle of independent assortment. It states that different pairs of alleles are passed to offspring independently of each other. The result is that new combinations of genes present in neither parent are possible. As a very simplistic example, if a man with blue eyes and brown hair fathers a child with a woman with brown eyes and black hair, their offspring can have blue eyes and black hair. The inheritance of blue eyes does not take brown hair ‘with it’; these traits are independently assorted. Thus Mendelian principles are applicable to human genetics as well. Note that all traits studied using Mendelian genetics refer to categorical, all-or-none, traits, that is black vs. brown, blue vs. brown, tall vs. short, etc. It does not apply with the same simplicity to dimensional traits such as IQ or blood pressure.

McGuffin P et al., eds. *Psychiatric Genetics and Genomics*. Oxford University Press, 2002, p. 37.

32.B. Autosomal recessive traits skip generations and may ‘catch families unaware’. Assuming a good degree of penetrance, an autosomal dominant pattern affects all generations. Mitochondrial diseases will affect all generations but via maternal inheritance. X-linked recessive disorders can skip generations but not X-linked dominant. Autosomal recessive diseases are clinically expressed only in homozygous states. Most commonly, the homozygote is produced by the union of two heterozygous parents (carriers) who themselves will be unaware of harbouring such an allele. The recurrence risk in children born to such parents is 25%. If an affected homozygote marries a heterozygote the recurrence risk is 50%. Consanguinity (union between relatives) increases the likelihood of inheriting autosomal recessive diseases as related parents may have both inherited carrier status for the same disease from their common ancestor.

Kumar PJ and Clark ML. *Clinical Medicine*, 6th edn. Elsevier, 2006, p. 169.

33.B. Mutation is a sudden, permanent, and heritable change in the DNA sequence. Changes in DNA may be transcribed to mRNA and translated to proteins, leading to disease expression. Point mutation refers to a single base change in DNA. Point mutations are usually substitutions, where one base is replaced by another. It is termed a transition if a purine is replaced by another purine or a pyrimidine replaced by another pyrimidine (e.g. A to G). It is called a transversion if a purine is replaced by a pyrimidine or vice versa (e.g. A to T). According to the effect on the triplet code, mutations could be a frame shift or in-frame. In frame-shift mutations, the deletion or insertion is not in multiples of three codons, for example a five-base deletion mutation. This leads to a shift in the triplet reading frame with variable results. In-frame mutation refers to changes occurring in multiples of three bases, with no disturbances in the reading frame. According to the effect of a mutation on the protein product, mutations could be silent, mis-sense, or nonsense. A silent mutation causes no change in the protein product—this is possible because a single amino acid is often coded by more than one triplet sequence. In a silent mutation one triplet sequence is replaced by a different sequence but without changing the amino acid sequence. In a mis-sense mutation, the new mutant codon specifies a different amino acid with variable effects on the final protein product, for example in haemophilia and sickle cell anaemia. In a nonsense mutation the new codon is UUA, UGA, or UAG, which signal ‘stop’ to the amino acid sequence, resulting in a non-functional protein. Point substitutions do not shift the reading frame; they often occur in non-coding regions and go unnoticed. Even in coding regions they are often silent or mis-sense mutations.

Kumar PJ and Clark ML. *Clinical Medicine*, 6th edn. Elsevier, 2006, pp. 176–177.

34.A. Thymidine and folate deprivation are used in the demonstration of fragile sites in chromosomes. Cytogenetic techniques now available for the direct molecular identification of such fragile sites. Fragile-X syndrome, Huntington’s disease, spinal muscular disease, and myotonic dystrophy are some of the disorders associated with fragile, trinucleotide expansions in chromosomes.

Glover TW. FUdR induction of the X chromosome fragile site: evidence for the mechanism of folic acid and thymidine inhibition. *American Journal of Human Genetics* 1981; **33**: 234–242.

35.E. Duration of untreated psychosis (DUP) is not an endophenotype. Working memory defects, information processing defects such as prepulse inhibition, smooth pursuit defects, glial cell changes, and certain other putative neurocognitive markers are termed probable endophenotypes for schizophrenia. To be an endophenotype, a characteristic must be observable independent of clinical state and must be measurable in relatives at a higher degree than in the general population. By definition, DUP cannot be measured in those who are not having psychosis.

Gottesman II and Gould TD. The endophenotype concept in psychiatry: etymology and strategic intentions. *American Journal of Psychiatry* 2003; **160**: 636–645.

36.B. Locus heterogeneity refers to the existence of mutations in different chromosomal loci resulting in the same disease phenotype. It is an important clinical phenomenon when attempting to test for the presence of a carrier state or mutation for a specific disease. For example, early-onset Alzheimer's disease could be caused by presenilin 1 or 2 mutations or by β amyloid precursor mutations. These mutations occur in chromosomes 14, 1, and 21, respectively. (Pleiotropy and allelic heterogeneity are explained below.)

Malats N and Calafell F. Basic glossary on genetic epidemiology. *Journal of Epidemiology and Community Health* 2003; **57**: 480–482.

37.A. When ascertaining cases for genetic family studies it is possible to miss certain cases as the disease has not occurred as yet in some members of the family. For example if a disease presents at age 40 on average, and if the studied family has three 'normal' members aged 50, 30, and 18, there is still the possibility that the latter two may become 'cases' in the future. Various methods of age correction have been employed to ascertain the morbid risk precisely in such cases. Weinberger's weighted age method is a popular approach. Life tables can also be used for age correction. In most genetic disorders, birth order does not play a role in disease expression as each birth is an independent genetic event. Duration or severity of illness does not complicate the issues in most family studies.

McGuffin P et al. *Seminars in Psychiatric Genetics*. Gaskell, 1994, p. 31.

38.A. Epistasis is the term used to describe gene interactions. Epistasis specifically refers to interaction between alleles at different genetic loci. This interaction is evident in the protein production and function of the involved genes. It can occur at the same step or at different stages of the same biochemical pathway. Variable expression refers to the variation in the degree of phenotypic expression seen in certain genetic disorders. Some individuals carrying the phenotype may be severely affected while others will only be mildly affected. This may be due to the effect of environment on a phenotype, allelic heterogeneity (different mutations causing a phenotype, leading to variation in expressed severity), or epistatic influences (another genetic loci conferring protection against severe expression by modifying the biochemical pathway at a distant site). Incomplete penetrance refers to the phenomenon where some individuals with the disease genotype do not display any signs of the disease at all. If the number of obligate carriers of a genotype (individuals who possess a genotype) is 100, and the number showing disease expression is 80, then the penetrance rate is 80%. Codominance refers to simultaneous expression of two alleles at a chromosomal locus, for example AB blood group when one chromosome has genotype A and the other has genotype B.

Malats N and Calafell F. Basic glossary on genetic epidemiology. *Journal of Epidemiology and Community Health* 2003; **57**: 480–482.

39.A. Multifactorial diseases could be defined by a threshold model. Considering psychiatric disorders, the families of affected individual often show substantially higher risk than the general population. These disorders can be described as quasicontinuous as the affected portion (defined categorically) of the population can be differentiated as mild to severe in the spectrum (continuous dimensions). This could be described as having a continuously distributed liability to develop the disease that is inherited, while the actual expression is multifactorial. If the liability crosses a particular threshold then disease expression could occur. This liability distribution curve is shifted to the right if relatives of a patient are considered, as, for the given threshold, more affected individuals are found in the families than in the general population.

McGuffin P et al., eds. *Psychiatric Genetics and Genomics*. Oxford University Press, 2002, p.46.

40.B. The odds ratio in most psychiatric genetic association studies are in the order of 1 to 2, the median being 1.3. This is insufficient to prove a genetic cause for most disorders. To demonstrate a more significant odds ratio, very large sample sizes are required; this methodological problem is being surmounted, at least partially, by meta-analyses that are providing evidence for the role of certain genes in psychiatric disorders. Non-contingent gene–disorder association refers to the fact that the relationship is not influenced by other factors such as environment or presence of other genes, that is not polygenic or multifactorial. But most psychiatric disorders do not follow non-contingent association models. The causal pathway from an identified genetic abnormality to actual disease expression is too complex and not fully explored in most known genetic markers of psychiatric diseases. For example it is unclear how a mutant dysbindin gene can lead to a belief that aliens are invading earth. There are few notable exceptions to this; for example the role of the serotonin transporter polymorphism in mediating the effects of life events on the risk of depression. For a long time, much genetic research was guided by the assumption that genes cause diseases, but the expectation that direct paths will be found from gene to disease has not proven fruitful for complex psychiatric disorders. Gene × environment interaction models of disease causation appear promising, as in Caspi's work, and may possibly throw more light on the causal chains from gene to disease.

Kendler KS. 'A gene for...: the nature of gene action in psychiatric disorders. *American Journal of Psychiatry* 2005; **162**: 1243–1252.

Caspi A et al. Influence of life stress on depression: Moderation by a polymorphism in the 5-HTT gene. *Science* 2003; **301**: 386–389.

41.A. It has been demonstrated that the 'short' polymorphism in the promoter region of the serotonin transporter gene (*SLC6A4*) is associated with impaired efficacy of fluvoxamine and paroxetine. The long form is associated with better SSRI efficacy. This can be understood by studying the mechanism of action of SSRIs. SSRIs produce antidepressant action by reducing the activity of serotonin transporter protein. In patients with the short polymorphism of the promoter region, the number of serotonin transporter molecules is reduced, leaving less substrate on which SSRIs can act. Hence the short form is associated with poorer response than the longer form, but this might be confounded by an ethnicity effect as Korean and Japanese patients show the opposite effect (the short version is associated with better SSRI response).

Malhotra AK et al. Pharmacogenetics of psychotropic drug response. *American Journal of Psychiatry* 2004; **161**: 780–796.

42.C. The name tuberous sclerosis comes from the characteristic tuber or potato-like nodules in the brain, which calcify and become sclerotic. The disorder is also known as epiloia or Bourneville's disease. Though most infants show signs in the first year of life, clinical features can be subtle initially, leading to misdiagnosis for years. The disease-causing mutations are present in either of two genes, *TSC1* and *TSC2*. *TSC1* is present on chromosome 9 and produces a protein hamartin. The *TSC2* gene is on chromosome 16 and produces a protein tuberin. The natural course is very variable, ranging from mild to severe illness. In addition to the benign tumours of kidney (cysts, angiomyolipomas), phakomas of eyes, cardiac tumours, and brain tumours (tubers, subependymal nodules, and astrocytomas) that frequently occur in tuberous sclerosis, other common symptoms include seizures, mental retardation, behaviour problems, and skin abnormalities. Malignant tumours are rare and occur primarily in the kidneys. An often quoted dermatological triad consists of adenoma sebaceum (facial angiofibromas), ash-leaf macules (hypomelanotic macules), and shagreen patches (pebbly skin on the nape of the neck). Café-au-lait patches and ungual fibromata are other manifestations of tuberous sclerosis. In most patients, tuberous sclerosis is due to a spontaneous new mutation but in those who inherit tuberous sclerosis, the pattern of inheritance is autosomal dominant.

McGuffin P et al., eds. *Psychiatric Genetics and Genomics*. Oxford University Press, 2002, p. 117.

43.A. This description fits best with fragile-X syndrome. Fragile-X syndrome is also known as Martin-Bell syndrome. It is the most common cause of inherited mental retardation and is the second most common cause of genetically associated mental deficiencies after trisomy 21. Clinical features include mild-to-moderate autism-like behaviour; especially hand flapping and gaze avoidance, attention deficits, and learning disability with an IQ often in the range 35 to 70. Delays in reaching early milestones for speech and language developmental are also noted. Normally, unaffected individuals have 5 to 55 CGG repeats at the 5' end of locus Xq27.3. A span of 65–200 repeats is known as a premutation, whereas more than 200 repeats is a full mutation. Hypermethylation of cysteine bases takes place at the fully mutant locus, leading to gene inactivation. In trinucleotide expansion diseases, CAG expansion is seen in Huntington's disease (chromosome 4); CTG expansion is seen in myotonic dystrophy (chromosome 19).

McGuffin P et al., eds. *Psychiatric Genetics and Genomics*. Oxford University Press, 2002, p.119.

44.A. Allelic heterogeneity is said to be present if different alleles at the same locus produce the same trait or disease expression. Consider sickle cell disease. In this condition all affected individuals carry the same mutation at the same locus. This is called genetic homogeneity. But in cystic fibrosis, at the same site on chromosome 7, 600 various mutations have been identified that result in the same disease phenotype. This is called allelic heterogeneity. Locus heterogeneity refers to a single disorder, trait, or pattern of traits that is caused by mutations in genes at different chromosomal loci.

Gelder M et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 247.

45.C. Pleiotropy is a very common phenomenon among genetic diseases. It refers to a single genetic defect producing a variety of defects, in multiple organs in the body, for example Marfan's syndrome. Here, an autosomal dominant mutation of a gene encoding fibrillin protein leads to a variety of defects, such as lens dislocation, skeletal deformities, and cardiac defects, especially aortic vessel disease.

Pyeritz RE. Pleiotropy revisited: molecular explanations of a classic concept. *American Journal of Medical Genetics* 2005; **34**: 124–134.

46.A. This refers to a frame-shift mutation. When a mutation results in misreading of a single triplet while other consecutive triplets are read correctly, it is called an in-frame mutation. If a mutation (usually a deletion or insertion) results misreading of all subsequent codons, then it is termed a frame-shift mutation.

Kumar PJ and Clark ML. *Clinical Medicine*, 6th edn. Elsevier, 2006, p. 176.

47.B. According to the law of segregation, inheritance of one trait occurs independently of another trait, but this is not always the case. This is due to random crossing over during meiosis, which allows the exchange of genetic segments that are significantly longer than a single gene. Such a crossing over results in the recombination of distant genetic loci. When two loci are close together, recombination is very unlikely and they are inherited as a single genetic element at a frequency significantly more than chance. This is called cosegregation, and the loci are said to be linked. Note that an essential condition for linkage is that the two loci must be on the same chromosome, called as syntenic loci; but not all syntenic loci are linked. Study of such linked loci is called linkage analysis. Restriction fragment length polymorphism is a method of genotyping single nucleotide polymorphisms using restriction endonucleases. Fluorescent *in situ* hybridization (FISH) involves denaturation of DNA on microscope slides and binding of sequence-specific DNA probes to the regions of interest on the exposed DNA strands. It is often used to study areas of deletion in chromosomes.

McGuffin P et al., eds. *Psychiatric Genetics and Genomics*. Oxford University Press, 2002, p. 55.

48. D. The distance between two loci can be measured in terms of the frequency with which they undergo recombination. For linked loci the frequency of recombination is less than 50%. Genetic distances are often expressed in centiMorgans (cM). One cM is equal to 1% recombination frequency between two loci, which can occur if nearly one million base pairs separate the two loci. LOD scores (log of odds) are used to estimate the likelihood that an observed recombination frequency is truly due to the loci being linked. It is given by the log of the ratio between the probabilities of the recombination frequency being the observed value (θ) to the expected value of 50% if they are not linked. A LOD of more than 3 indicates a linkage; less than -2 indicates no linkage. The value of θ at which LOD scores are greatest is the most likely estimate of recombination frequency.

Malats N and Calafell F. Advanced glossary on genetic epidemiology. *Journal of Epidemiology and Community Health* 2003; **57**: 562–564.

49. C. LOD scores were first used by Morton in 1955. It is a statistical method to establish linkage disequilibrium. A LOD (or log of odds) score is the common log of the likelihood that the recombination fraction has a certain value, θ , divided by the likelihood that it is 1/2. Conventionally, a LOD of 3, representing an odds of linkage of 1000: 1, is the accepted level for concluding linkage.

Malats N and Calafell F. Advanced glossary on genetic epidemiology. *Journal of Epidemiology and Community Health* 2003; **57**: 562–564.

50. C. Genotype frequency measures the proportion of each genotype, AA or AB or BB, in a population. Gene frequency measures the frequency of each allele at a particular locus in the population. Here, the frequency of allele A is $(40 \times 2) + 54 = 134\%$ or 1.34. The frequency of B is $(6 \times 2) + 54 = 66\%$ or 0.66.

Kumar PJ and Clark ML. *Clinical Medicine*, 6th edn. Elsevier, 2006, p. 190.

51.A. Consider an epileptic disease with generalized tonic–clonic seizures which could be caused by a genetic alteration. An identical generalized seizure could be a result of head injury that someone sustained. This is called as phenocopy. Here, phenotypic expression occurs in the absence of a genotype, due to a non-genetic reason. The term pleiotropy and the two types of heterogeneity—allelic and locus—are explained elsewhere in this chapter.

Malats N and Calafell F. Basic glossary on genetic epidemiology. *Journal of Epidemiology and Community Health* 2003; **57**: 480–482.

52. E. Gene frequencies and genotype ratios in a randomly breeding population remain constant from generation to generation. This is known as the Hardy–Weinberg law. This holds true only if the population is randomly breeding. If mutations are occurring in two genes at different frequencies, then this does not hold true as gene frequencies would change. In addition, if members of one population breed with occasional immigrants from an adjacent population this will introduce new genes or alter existing gene frequencies in the population. This is called gene flow. Similarly, strong interbreeding can happen within members of local populations. If the population is small, the Hardy–Weinberg equilibrium may be violated. As random mating can be assured only if sufficient numbers of matings occur, this is not possible in a small population. In such cases, the frequency of an allele may begin to drift toward higher or lower values. This is called genetic drift; it is accidental and aimless and is not an adaptive genetic change as it does not guarantee that the new generations will be more fit than the predecessors. In natural selection, certain alleles are positively selected and so their frequencies increase compared to other genes. This will result in failure of the Hardy–Weinberg equilibrium.

Malats N and Calafell F. Basic glossary on genetic epidemiology. *Journal of Epidemiology and Community Health* 2003; **57**: 480–482.

53. C. RNA is produced from DNA via transcription in most eukaryotic cells. A reverse procedure, where DNA is produced from RNA, takes place in certain viruses, especially retroviruses, including HIV. This procedure is mediated by a reverse transcriptase enzyme. DNA ligase acts in sealing DNA ends together during DNA replication. RNA polymerase acts in transcription of RNA from DNA. Primase acts in the initiation of DNA synthesis by catalysing the synthesis of RNA primers; this is necessary because DNA polymerases cannot initiate DNA synthesis without the help of RNA primers. When DNA replication is complete, DNA polymerase 1 destroys the RNA primers. DNA polymerase 1 contains an exonuclease which helps in proof-reading activity during DNA synthesis.

Kumar PJ and Clark ML. *Clinical Medicine*, 6th edn. Elsevier, 2006, p. 165.

54. C. Mitosis takes place in six identifiable phases. During interphase a cell is at rest. The individual chromosomes are not visible and active growth takes place. During prophase, which is the first phase of mitosis, the chromosomal material doubles and the nuclear membrane is broken down. Centrioles and spindle fibres become visible. During metaphase the chromosomes are equatorially aligned. Each centromere is now attached to two spindle fibres coming from opposite poles. During anaphase, the chromosomes separate and travel to opposite poles. During telophase an indentation appears in the cellular membrane and cytokinesis is then completed.

Morgan DO. *The Cell Cycle: Principles of Control*. New Science Press, 2007, p. 4–5.

55. A. In prophase, condensation of the replicated chromosomal material leads to the formation of sister chromatids, still attached at the centromeres. Each chromosome has two short and two long chromatids, corresponding to the short and long arms of the chromosomes.

Morgan DO. *The Cell Cycle: Principles of Control*. New Science Press, 2007, p. 4–5.

56. D. This can be calculated using the Hardy–Weinberg equilibrium. If p and q are the allele frequencies of recessive copy ‘ a ’ and dominant copy ‘ A ’, respectively, then p^2 gives the frequency of homozygous aa and q^2 gives the frequency of homozygous AA. $2pq$ gives the frequency of the heterozygous aA. $1/1600$ is the frequency of homozygous individuals, that is p^2 . Hence, $p = 1/40$. If $p = 1/40$, then q will be $1 - p = 39/40$. The number of heterozygous carriers is given by $2 \times 1/40 \times 39/40 = 1/20$ approximately. As one can see easily from this calculation, at any given time in a population there are more heterozygous carriers than diseased individuals. So negative eugenics, that is elimination of all diseased individuals, cannot eliminate an autosomal recessive disease.

Malats N and Calafell F. Basic glossary on genetic epidemiology. *Journal of Epidemiology and Community Health* 2003; **57**: 480–482.

57. E. Arachidonic acid is a fatty acid often found in membrane phospholipids. It is not a component of nucleic acids. Nucleic acids are made up of a purine or pyrimidine base, a pentose sugar moiety, and a phosphate group. Depending on whether the sugar is deoxyribose or ribose sugar, nucleic acids are either DNA or RNA.

Kumar PJ and Clark ML. *Clinical Medicine*, 6th edn. Elsevier, 2006, p. 164.

58.A. Association studies simply compare the frequency of a particular marker, for example a polymorphism, in diseased and normal populations. These are usually case-control studies and are comparatively easy to carry out. Linkage studies investigate the cosegregation of a disease and a set of genetic markers. Here, the aims are to determine linkage among candidate loci and determine the genetic distance between loci in an attempt to narrow down the site of the genetic abnormality. Linkage study is possible only if at least one parent has a double heterozygote make-up, that is heterozygous at both marker and disease loci. Family study refers to a genetic study whereby cases are ascertained by interviewing all available relatives of an identified proband. Age correction must be applied in such family-based case ascertainment. Adoption study investigates shared traits or phenotypes among adoptees, adopting families, and biological families in various combinations. Ecological study is not a specific genetic study.

Gelder M et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, pp. 236 and 240.

59.A. In twin studies, case ascertainment and zygosity assignment is done initially. Later, concordance or discordance is measured to determine the heritability. This could be done by counting the proportion of the total number of concordantly affected twins among all pairs studied (pair-wise concordance) or by calculating the proportion of the number of affected twins among all cotwins studies (probands-wise concordance). The latter is possible if there is a twin register maintained with systematic ascertainment. Zygosity does not influence selection of the methods. Multifactorial diseases are commonly studied using twin studies by both methods.

Gelder M et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 236.

60.B. Autosomal recessive diseases often skip generations. The usual pattern of inheritance is from two heterozygous carriers, who are often unaware of their carrier status until their child is born homozygous with the disease. The chance of having an offspring with homozygous inheritance is 1 in 4; in other words, one affected child for every three unaffected children born (1:3). This ratio becomes 1:1 (50%) if one of the parents is homozygous and suffering from the disease.

Kumar PJ and Clark ML. *Clinical Medicine*, 6th edn. Elsevier, 2006, p. 183.

61.E. Increased death rate will not affect the number of genes or genotype distribution in a population directly. All the other options given can alter the Hardy-Weinberg equilibrium.

Malats N and Calafell F. Basic glossary on genetic epidemiology. *Journal of Epidemiology and Community Health* 2003; **57**: 480-482.

62.A. For continuous traits such as IQ, path analysis could be used in measuring heritability from concordance rates. The heritability $h^2 = 2(RMZ - RDZ)$. Here monozygotic concordance is 0.86 and dizygotic concordance is 0.61. Hence, heritability is given by $2(0.86 - 0.61) = 2(0.25) = 0.5$.

McGuffin P et al., eds. *Psychiatric Genetics and Genomics*. Oxford University Press, 2002, p. 45.

63.E. Cystic fibrosis follows an autosomal recessive inheritance pattern. It is one of the most frequently occurring recessive gene mutation in Caucasian populations, with an estimated frequency of 1 in 30 carriers in the general population. Single-gene disorders usually follow the Mendelian pattern of inheritance; notable exceptions are mitochondrial diseases, trinucleotide expansion diseases, and genomic imprinting.

Kumar PJ and Clark ML. *Clinical Medicine*, 6th edn. Elsevier, 2006, p. 185.

64. C. Path analysis provides a diagrammatic approach to estimate the contribution of genetic and environmental factors in inheritance of a trait. The shared environment and shared genetic make-up are drawn to demonstrate the sources of resemblance between two siblings. Path coefficients are calculated for each connecting path between the sources and the siblings, and sum of these coefficients can provide a genetic correlation between the siblings.

Gelder M et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 237.

65. B. The relative influence of genetic factors in defining the variance in a trait is expressed as heritability. If this is defined as the proportion of the total phenotypic variance attributable to additive genetic variance, then it is known as narrow-sense heritability. Heritability is also sometimes used to describe the proportion of variance explained by the total genetic variance (additive and non-additive genetic variance); here it is called broad-sense heritability. Non-additive genetic influences include phenomena such as epistasis (gene–gene interaction) and dominance effects, where presence of one gene mitigates the expression of other gene. A twin pair is said to be concordant when both cotwins have the same disease expression (or both are disease free). The pair can be discordant if one of them harbours a disease while the other does not. Due to the higher degree of genetic similarity among monozygotic twins, one would expect higher concordance between monozygotic twins compared to dizygotic twins if the disease being studied has a significant genetic component.

Gelder M et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 235.

66. C. A linkage to chromosome 17 has been shown for a specific variant of frontotemporal dementing syndrome. This syndrome is now referred to as frontotemporal dementia with parkinsonism-17 (FTDP-17). The linkage region contains the gene for tau protein. tau pathology is noted in various other dementing syndromes, including Alzheimer's disease, where inappropriate hyperphosphorylation of tau is implicated in the production of neurofibril tangles.

Tasman A, Maj M et al., eds. *Psychiatry*, 3rd edn. John Wiley and Sons, 2008, p. 397.

67. D. HLA stands for human leukocyte antigens. These molecules are expressed on the surface of white blood cells to coordinate the immune response. DR and DQ are two different types of HLA molecules. Many different HLA 'subtypes' (DR1, DR2, DQ1, DQB1*0602) exist normally. HLA DR2 subtype has been linked to narcolepsy–cataplexy syndrome. African-American narcoleptic patients are frequently DR2 negative but they have a stronger association with another HLA gene allele, HLA-DQB1*0602.

Singh S, George C, Krygger M, and Jung J. Genetic heterogeneity in narcolepsy. *Lancet*, 1990; **335**: 726–727.

68. D. The gene for the MAO-A enzyme is located on chromosome X. In males a single X chromosome yields two dissimilar MAOA genotype variations: a high and a low activity variant. Females have two copies of the X chromosome, hence they can have three different levels of MAO-A activity: a high–high activity group (homozygous high), a low–low activity group (homozygous low), and a third, heterozygous group with low–high (mixed pattern). Caspi et al. (2002) studied MAO-A related genetic influences on the outcome of childhood maltreatment. They found out that high MAO-A activity exerts a protective influence against the development of antisocial outcomes (such as adolescent conduct disorder, violent episodes, etc.), especially in maltreated boys and to some extent in girls.

Caspi A, McClay J, Moffitt TE et al. Role of genotype in the cycle of violence in maltreated children. *Science* 2002; **297**: 851–854.

69. D. Milder forms of mania respond better to lithium than severe mania. Patients with classical features of mania respond better than those with schizoaffective presentation. On a similar note, dysphoric mania, mixed affective episodes, and rapid-cycling mania respond poorly to lithium treatment. Having a family history of bipolar illness is suggestive of good prophylactic response of lithium in relapse prevention; such an effect is not clearly demonstrated for the effects of lithium in treating acute mania.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 33.

70. E. Friedreich ataxia (FRDA1) is caused by mutation in the gene encoding a protein called frataxin. The locus of the frataxin gene has been mapped to chromosome 9q. The most common molecular abnormality that affects the site of this gene is a trinucleotide repeat expansion of the triplet codon GAA in intron 1 of the frataxin gene. Another locus for Friedreich's ataxia has been mapped to chromosome 9p; it is called FRDA2.

Lynch DR, Farmer JM, Balcer LJ et al. Friedreich ataxia: effects of genetic understanding on clinical evaluation and therapy. *Archives of Neurology* 2002; **59**: 743–747.

71. C. First-degree relatives share 50% of their genes in common. This genetic relatedness reduces to 25% among second-degree relatives and 12.5% among third-degree relatives. The possible contribution of genetic factors for a disorder can be studied using the resemblance of disease risk across successive generations. A strong genetic contribution is suggested by a 50% decrement in disease risk with successive generations. If the risk decreases by more than 50% this suggests that the disease is either multifactorial with the possibility of significant gene-environment interaction or a more complex mode of genetic transmission. The ratio of the rate of the disorder in relatives to the population-based rate is commonly denoted by λ . This does not refer to linkage equilibrium. For diseases that are autosomal dominant in inheritance, λ tends to exceed 20; for complex multifactorial disorders, λ derived from family studies tends to range from 2 to 5.

Tasman A, Maj M et al., eds. *Psychiatry*, 3rd edn. John Wiley and Sons, 2008, p. 258.

72. D. The proportion of phenotypic variation attributable to genetic causes is referred to as heritability in the broad sense. The proportion attributable to non-genetic causes includes shared and non-shared environmental variance, gene-environment covariance, and interaction. The estimate of heritability for major depression from twin studies is around 0.37. The relative risks based on the existing adoption studies suggest that the familial recurrence cannot be attributed solely to shared environmental factors. The remaining 63% of variance is almost wholly attributed to environmental factors unique to the individual.

Tasman A, Maj M et al., eds. *Psychiatry*, 3rd edn. John Wiley and Sons, 2008, p. 260.

73. C. The apolipoprotein-E $\epsilon 4$ (APOE $\epsilon 4$) allele increases the risk of Alzheimer's disease in a dose-dependent fashion. The odds of developing Alzheimer's disease are 2.6–3.2 times greater in those with one copy, and nearly 15 times higher in those with two copies of the APOE $\epsilon 4$. A significant protective effect has been noted in those with $\epsilon 2/\epsilon 3$ genotype. The population attributable risk due to APOE $\epsilon 4$ allele for Alzheimer's dementia is very high due to its high frequency of occurrence in the general population. APOE $\epsilon 4$ can also increase the risk of vascular dementia.

Davidson Y, Gibbons L, Purandare N et al. Apolipoprotein E $\epsilon 4$ allele frequency in vascular dementia. *Dementia and Geriatric Cognitive Disorders* 2006; **22**: 15–19.

Tasman A, Maj M et al., eds. *Psychiatry*, 3rd edn. John Wiley and Sons, 2008, p. 263.

74. C. A gene on locus 13q34, called *G72*, codes for D-amino acid oxidase activator (DAOA). A series of initial studies have identified this genetic locus as potentially contributing to schizophrenia susceptibility. The D-amino acid oxidase is the only enzyme oxidizing D-serine. D-serine is an important coagonist for the NMDA glutamate receptor. Hence it is posited that the variations in the *G72* gene may influence the efficiency of glutamate gating at *N*-methyl-D-aspartate-type (NMDA) receptors, but some later studies have failed to replicate the earlier findings. *G72* has also been associated with depression in psychotic patients and also with bipolar disorder.

Boks MPM, Rietkerk T, van de Beek MH et al. Reviewing the role of the genes *G72* and DAOA in glutamate neurotransmission in schizophrenia. *European Neuropsychopharmacology* 2007; **17**: 567–572.

75. B. Only a very small percentage (nearly 1.5%) of the human genetic code carried in DNA encodes proteins. This is because a large proportion of human DNA consists of long intron sequences, which are non-coding portions that get spliced out when transcription takes place. Hence, even when the complete sequence of a genome is known, mapping the functional genetic code will be difficult. A transcriptome is defined as all messenger RNA (mRNA) molecules transcribed from the DNA in a cell. The mRNA molecules act as 'mediators' between DNA codes and actual protein products. A transcriptome is not unique for a species or even for an individual; this is because what genes are transcribed in a cell depends on the kind of cell (e.g. WBCs, hepatocytes, epithelial cells) and what function is being carried out by the cell at that time. Hence, environmental influences or physiological needs will modify the transcriptome.

Ito C and Ouchi Y. Toward schizophrenia genes: Genetics and transcriptome. *Drug Development Research* 2003; **60**: 111–118.

76. B. The monozygotic concordance for simple Mendelian disorders is approximately 100%. This is because the penetrance is usually complete (though it may vary) in simple Mendelian disorders. In contrast, penetrance is incomplete in schizophrenia. Phenocopies of schizophrenia are very common; multiple organic and drug-induced states resemble schizophrenia. Locus heterogeneity in the same family is not a feature of simple Mendelian disorders affecting single loci. As the exact genetic localization of schizophrenia is still not certain, locus heterogeneity cannot be determined for schizophrenia, but given the multifactorial nature of schizophrenia, significant locus heterogeneity is very likely. Mendelian disorders need not necessarily present in childhood; many autosomal dominant disorders present clinically only in adulthood.

Kendler KS and Eaves L, eds. *Psychiatric Genetics. Review of Psychiatry Series*, American Psychiatric Publishing, 2005, p. 108.

77.A. The human genome is comprised of two sets of 23 chromosomes, one set inherited from each parent, and the DNA encodes 30 000 genes. Formerly, it was believed that genes were almost always present in two copies in a genome, but recently large segments of DNA of various sizes have been found to differ in copy number. Such copy-number variations (or CNVs) can lead to dosage imbalances in both functional (exons) and non-coding (introns) regions. As a result, many genes that were thought to occur in two copies per genome have now been found to be present in one, three, or even more copies.

Daar AS, Scherer SW, and Hegele RA. Implications for copy-number variation in the human genome: a time for questions. *Nature Reviews Genetics* 2006; **7**: 414.

78.D. Fragile-X patients have more than 200 CGG repeats in the 5' untranslated region of the fragile-X mental retardation 1 gene (*FXMR-1*). As in other trinucleotide repeat diseases, these expansions originate from phenotypically normal individuals who carry an intermediate number of unstable repeats (60 to 200). Normal individuals have 6 to 60 repeats. Even in carriers with premutation, longer repeats are observed to be more toxic than shorter, near normal ones. These carriers may show evidence of a neurodegenerative condition distinct from fragile X. The degree of toxicity increases with abundance of the transcript. CAG repeats are seen in Huntington's chorea.

Casci, T. *Fragile X: a class of its own*. *Nature Reviews Genetics* 2003; **4**: 758.

79.A. Genetic testing for Huntington's disease involves testing the person at risk for the presence of excessive DNA repeats that predict development of clinical features. The test cannot predict the age at which the onset of such symptoms could occur. Almost all patients carry a specific mutant gene at chromosome 4 and the inheritance has complete penetrance. Earlier genetic testing involved linkage analysis with only probabilistic estimates given to at-risk individuals. The tested individuals were given a risk estimate of less than 5% or greater than 95%, based on the results. Since 1993, direct identification of the trinucleotide expansion has been made possible, greatly increasing the accuracy of the test to nearly 100%. Being an autosomal dominant condition, the disease exhibits an all-or-none phenomenon; homozygotes are no more severely affected than heterozygotes. Prenatal testing is possible even when the at-risk parent has not had a test him/ herself. In this case, only the proportion of the parent's risk that is passed on to the fetus can be estimated; often this may not give sufficient information to decide on termination of pregnancies. The disease can occur in persons with apparently no positive family history, though this is extremely rare nowadays.

Myers RH. *Huntington's disease genetics*. *NeuroRx* 2004; **1**: 255–262.

80.A. This patient presents with neurofibromatosis type 1. Patients with neurofibromatosis can present with light-brown spots on the skin (café-au-lait spots), neurofibromas, freckling in the area of the armpit or the groin, hamartoma of the iris (Lisch nodules), optic glioma, and scoliosis. Many children with NF1 have larger than normal head circumference and may have congenital heart defects. They may have poor linguistic and visual-spatial skills, in addition to attention deficit hyperactivity disorder (ADHD). Most symptoms are notable before the age of 10. The genetic localization of *NF1* points to chromosome 17. The *NF1* gene codes for a protein called neurofibromin, which acts as a regulator of cell division in the CNS. A second type of neurofibromatosis is called NF2; the clinical presentation and genetic abnormality seen in NF2 are different from NF1. The gene responsible for NF2 has been identified on chromosome 22. The *NF2* gene product codes a tumour-suppressor protein called merlin.

DeBella K, Szudek J, and Friedman JM. *Use of the national institutes of health criteria for diagnosis of neurofibromatosis 1 in children*. *Pediatrics* 2000; **105**: 608–614.

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chapter
2

EPIDEMIOLOGY

QUESTIONS

- 1. Which of the following refers to the incidence rate of dementia in a catchment area?**
 - A. Number of patients with dementia during a specified time interval
 - B. Number of newly diagnosed patients with dementia
 - C. Ratio of the number of newly diagnosed patients with dementia during a specified time interval to the total population in the same area
 - D. Ratio of the number of patients with dementia at a given time to the total population in the same area
 - E. Number of newly diagnosed patients with dementia who are still surviving at the time of the survey

- 2. In a National Comorbidity Survey carried out in the US, the proportion of the sampled individuals who ever manifested criteria of panic disorder in their lifetime was determined. This can be best described as which of the following?**
 - A. Incidence
 - B. Point prevalence
 - C. Lifetime prevalence
 - D. Lifetime morbid risk
 - E. Period prevalence

- 3. Using case records, the number of newly diagnosed cases of psychosis in south-east London was determined for a period of 33 years, between 1965 and 1997. To calculate incidence rate, which of the following is the most suitable denominator?**
 - A. Total south-east London population in the year 1965 minus number of cases
 - B. Total south-east London population in the year 1997
 - C. Census of south-east London population aged more than 16 in the year 1981
 - D. Census of south-east London population aged more than 16 in the year 1965
 - E. Census of south-east London population aged more than 16 in the year 1997

- 4. Which of the following equations gives the relationship between prevalence and incidence?**
- A. Prevalence = duration of disease × incidence rate
 - B. Incidence rate = duration of disease × prevalence
 - C. Prevalence = mortality rate × incidence rate
 - D. Incidence rate = mortality rate × prevalence
 - E. Prevalence = mortality rate × incidence × duration of disease
- 5. A major cause of mortality in schizophrenia is cardiovascular problems. If a new class of antipsychotics with favourable metabolic profile that reduces cardiac risk is introduced, which of the following could happen?**
- A. Increase in incidence and prevalence of schizophrenia
 - B. Increase in prevalence of schizophrenia, but reduced incidence
 - C. Increased prevalence but unaffected incidence
 - D. Reduction in both incidence and prevalence
 - E. Both incidence and prevalence will remain unaffected
- 6. Which of the following expresses an incidence rate measured for a subgroup of a population?**
- A. Crude mortality rate
 - B. Lifetime prevalence rate
 - C. Standardized mortality rate
 - D. Specific mortality rate
 - E. Survival rate
- 7. Which of the following correctly expresses proportional mortality rate due to anorexia nervosa?**
- A. Number of anorexia-related deaths in a year/ total midyear population
 - B. Number of anorexia-related deaths in a year/ total number of all cause deaths
 - C. Number of anorexia-related deaths in a year/ total number of new cases diagnosed with anorexia in the same year
 - D. Number of anorexia-related deaths in a year/ 1-year prevalence of anorexia
 - E. Number of all cause deaths in a year/ number of anorexia-related deaths in the same year
- 8. Which of the following is a major advantage in using standardized mortality rate compared to crude mortality rate?**
- A. Comparisons between populations is easier with the standardized rate.
 - B. True value of the number of deaths in a population is given by a standardized rate.
 - C. Standardized rates can be expressed in meaningful units while crude rates do not have a specific unit for expression.
 - D. Standardized rates provide an idea about cause of deaths in a population.
 - E. The accuracy of measurement is increased by using standardized rates.

- 9. There are 65 suicides in a population of 1300 patients with schizophrenia. The rate 65/1300 refers to which one of the following?**
- A. Proportional mortality rate
 - B. Cause-specific mortality rate
 - C. Case fatality rate
 - D. Standardized mortality rate
 - E. Crude mortality rate
- 10. Patients with undiagnosed subsyndromal hypomania have clinical characteristics closely resembling which one of the following diagnoses?**
- A. Bipolar type 1
 - B. Dysthymia with depression
 - C. Depression with stimulant use
 - D. Bipolar type 2
 - E. Major depressive disorder
- 11. In major epidemiological studies, the mean time lag between onset and clinical treatment for major depressive disorder is determined to be around**
- A. 3 months
 - B. 3 weeks
 - C. 3 years
 - D. 13 years
 - E. 3 days
- 12. Considering the epidemiology of major depressive disorder, which of the following is incorrect with respect to seeking treatment?**
- A. Nearly half of men with depression do not get treated.
 - B. Women seek treatment more often than men.
 - C. Treatment is sought earlier in developed countries.
 - D. Less than 20% of depressive episodes do not come to clinical attention.
 - E. Earlier onset is associated with poorer treatment-seeking behaviour.
- 13. Major depressive disorder often coexists with personality disorders. Which of the following groups of personality disorders is most commonly associated with depression?**
- A. Paranoid, schizotypal, and schizoid
 - B. Histrionic, borderline, and antisocial
 - C. Dependent and anxious avoidant
 - D. Sadistic and narcissistic
 - E. Obsessive compulsive and passive aggressive

- 14. Major depressive disorder often coexists with personality disorders. What is the proportion of patients with major depression and lifetime comorbidity of personality disorders in community samples?**
- A. 10%
 - B. 60%
 - C. 75%
 - D. 3%
 - E. 30%
- 15. To estimate the number of homeless mentally ill patients, an initial survey was carried out in a defined area of central London and identified patients were registered. Six months later, another random sampling was carried out and using the identified proportion of previously registered homeless mentally ill, reliable population values were deducted. This method of epidemiological survey is best described as**
- A. Capture–recapture study
 - B. Cohort study
 - C. Cross-sectional survey
 - D. Audit
 - E. Comorbidity survey
- 16. Who first coined the term comorbidity?**
- A. Folstein
 - B. Feinstein
 - C. Einstein
 - D. Bradford Hill
 - E. Gauss
- 17. Which of the following is the best estimate of the incidence of schizophrenia if a rigorous systematic review of various epidemiological studies to date is carried out?**
- A. 15 per 100 000
 - B. 1 per 100
 - C. 4 per 1000
 - D. 7 per 1000
 - E. 5 per 100 000
- 18. The male to female risk ratio for developing schizophrenia is calculated to be which of the following values?**
- A. 1 : 1
 - B. 1.4 : 1
 - C. 3 : 1
 - D. 1 : 2
 - E. 4 : 1

19. The risk ratio for developing schizophrenia in migrants compared to a native population is

- A. 1 to 2.6
- B. 1.6 to 1
- C. 4.6 to 1
- D. 6 to 1
- E. 1 to 1

20. The probability of developing a disorder anytime throughout the life course of a birth cohort is called

- A. Lifetime prevalence
- B. Lifetime morbid risk
- C. Life expectancy
- D. Period prevalence
- E. Cumulative incidence

21. Which of the following could be estimated using the summation of age-specific incidence rate of schizophrenia throughout the average life expectancy of a population?

- A. Age-specific prevalence rate of schizophrenia
- B. Lifetime morbid risk of schizophrenia
- C. Lifetime prevalence of schizophrenia
- D. Cumulative incidence of schizophrenia
- E. Period prevalence estimate of schizophrenia

22. The male:female ratio for prevalence of schizophrenia is estimated to be

- A. 1 : 1
- B. 2 : 1
- C. 3 : 1
- D. 1 : 2
- E. 2 : 3

23. The lifetime morbidity ratio associated with schizophrenia is estimated to be

- A. 15 per 100 000
- B. 1 per 100
- C. 4 per 1000
- D. 7 per 1000
- E. 5 per 100 000

24. The population attributable fraction for seasonal birth in the incidence of schizophrenia is estimated to be around

- A. 30%
- B. 50%
- C. 2%
- D. 10%
- E. 6%

25. The incidence rate of an illness varies widely across different countries.

The prevalence measures, calculated at the same time, do not follow the same pattern of variation but are uneven. Which of the following could explain this disparity?

- A. Different scales were used for measuring new and old cases
- B. Recall bias explains the high incidence rates
- C. Respondent bias explains the prevalence rates
- D. The risk factors for causation and prognosis are different
- E. The disease is a fatal condition

26. The frequency of adults reporting lifetime presence of mental health problems in Europe is estimated to be around

- A. 1 in 4
- B. 1 in 10
- C. 1 in 2
- D. 1 in 25
- E. 1 in 100

27. Considering pathways of care in mental health, which of the following is not a major filter for help seeking?

- A. Self-recognition of emotional difficulties
- B. Diagnostic ability of a general practitioner
- C. Acceptance rate at secondary care
- D. Occupational health initiatives at a place of employment
- E. In-patient admission facilities at local psychiatric services

28. In epidemiological surveys across life span, the term persistence refers to which of the following?

- A. Number of patients with lifetime prevalence who have 12 months prevalence
- B. Number of patients with 12 months prevalence who will develop chronic problems if followed up
- C. Number of patients with lifetime prevalence who spent more than 1/3 of life with the disease
- D. Number of patients with lifetime prevalence who spent more than 1/2 of life with the disease
- E. Number of patients with lifetime prevalence who are seeking health-care input

29. Epidemiological catchment area study is one of the major surveys in psychiatric epidemiology. Which of the following instruments was used for clinical diagnosis in this survey?

- A. Composite international diagnostic interview
- B. Diagnostic interview schedule
- C. Schedules for clinical assessment in neuropsychiatry
- D. Operational criteria checklist
- E. Revised clinical interview schedule

30. Which of the following could explain the differential outcome for schizophrenia between developing and developed nations?

- A. Economic differences
- B. Diagnostic differences
- C. Differential methods used in outcome measurement
- D. Difference in mode of onset of psychosis
- E. None of the above

31. Which of the following was a WHO-sponsored survey of outcome in schizophrenia across different countries?

- A. IPSS study
- B. DOSMeD study
- C. NEMESIS study
- D. DEPRES study
- E. ECA study

32. According to results from the World Mental Health Survey Initiative, which of the following is true?

- A. Developed countries have more mental health problems
- B. Severity of mental illness is not proportional to seeking treatment
- C. The unmet needs of mental health are equal across all countries
- D. The most common mental disorder globally is alcohol misuse
- E. Most patients who receive treatment have severe illness.

33. In Europe, the age group with highest prevalence of mental health problems is

- A. Over 65
- B. Under 16
- C. 18 to 24
- D. 25 to 34
- E. 35 to 50

34. In any given year, the proportion of Europeans who receive antidepressants for their depression is estimated to be around

- A. 20%
- B. 40%
- C. 60%
- D. 5%
- E. 90%

35. Among people who experience panic attacks, which of the following is the most common presentation?

- A. Agoraphobia with panic attacks
- B. Isolated panic attacks only
- C. Panic disorder
- D. Panic disorder with agoraphobia
- E. Physical disorder causing panic attacks

36. The proportion of Europeans with mental health difficulties who have sought help from a psychiatrist within the last 1 year is estimated to be around

- A. 20%
- B. 40%
- C. 60%
- D. 5%
- E. 90%

37. The mean age of onset of panic disorder or agoraphobia is estimated to be around

- A. 22 years
- B. 33 years
- C. 44 years
- D. 55 years
- E. 11 years

38. Women outnumber men in prevalence of most anxiety disorders. Which of the following anxiety disorders is noted more commonly in men than women attending health-care services?

- A. OCD
- B. Panic disorder
- C. Agoraphobia
- D. Social phobia
- E. Specific phobia

39. Which of the following types of specific phobia often starts before the age of 10?

- A. Blood injury phobia
- B. Space phobia
- C. Situational phobia
- D. Agoraphobia
- E. Animal phobia

- 40. In an epidemiological survey, mood state and functional impairment are recorded using a purpose-built scale. Which of the following can increase the reliability of such a questionnaire?**
- A. Increasing the number of questions pertaining to each theme
 - B. Giving more time to respond to questions
 - C. Reducing the length of questionnaire to minimum
 - D. Using two observers for self-rated scales
 - E. Making the responses unstructured but descriptive
- 41. In the Stirling County Study of the prevalence of depression and anxiety, the questions used to diagnose depression in 1952 were modified in 1992. Which of the following best explains why this was done?**
- A. The concept of depression changed in 40 years.
 - B. Diagnostic schemes changed in 40 years, necessitating modification of questions.
 - C. Vernacular terms used in describing depression changed over 40 years.
 - D. Availability of treatment differed between 1952 and 1992.
 - E. Severity of depression changed in 40 years.
- 42. Which of the following epidemiological studies suggested that lifetime prevalence of depression has remained unchanged over recent decades?**
- A. National Comorbidity Survey, 1994
 - B. Epidemiological Catchment Area Study, 1984
 - C. Stirling County Study, 1992
 - D. National Epidemiological Survey on Alcohol and Related Conditions, 2002
 - E. National Comorbidity Survey Replication, 2002
- 43. The prevalence of hallucinatory experiences in healthy British respondents from community samples is estimated to be around**
- A. 4%
 - B. 11%
 - C. 33%
 - D. 19%
 - E. 0.2%
- 44. A sample of healthy British community respondents was surveyed for self-reported psychiatric symptoms. Most respondents would rate themselves to have had which of the following symptoms?**
- A. Hallucinations
 - B. Hypomania
 - C. Paranoia
 - D. Thought insertion
 - E. Strange experiences

45. In epidemiological surveys of preschool children, which of the following factors observed around age 3 of a child predicts behavioural difficulties by age 8?

- A. Mother being a house-wife
- B. More than two children in the household
- C. Maternal depression
- D. Deprived neighbourhood
- E. Physical health problems at age 3

46. Mental health and problem behaviours in a community sample of 10- to 11-year-old children were recorded in the Isle of Wight study in 1960. The prevalence of diagnosable psychiatric disorders in this study was approximately

- A. 6%
- B. 21%
- C. 1%
- D. 16%
- E. 30%

47. Which of the following statements regarding epidemiological surveys in child and adolescent mental health is true?

- A. Psychiatric disorders decrease with increase in age.
- B. Adolescents have more burden of psychiatric diseases than younger children.
- C. The marital relationship of parents influences the severity but not prevalence of psychiatric diagnoses.
- D. Parents and teachers have a high degree of agreement as to which child is having mental health problems.
- E. Most children diagnosed in community surveys were known to mental health services.

48. Questionnaires used in epidemiological surveys can be administered either by clinicians or trained non-clinicians. Which of the following is true about these instruments?

- A. The rate of psychiatric diagnoses is more when using clinician administered instruments.
- B. The rate of psychiatric diagnoses is the same irrespective of the type of instrument.
- C. High level of agreement exists between SCAN (clinician administered) and CIS-R (layperson administered).
- D. Clinician administered instruments are superior for screening purposes.
- E. Often a structured lay interview is followed by clinical diagnostic assessment for case ascertainment.

49. With regard to surveys of suicidal ideation, the transition from ideas to plans or attempts occurs most frequently in which of the following time intervals?

- A. Within 1 week of the ideation
- B. Within 1 month of the ideation
- C. Within 3 months of the ideation
- D. Within 1 year of the ideation
- E. Within 10 years of the ideation

50. In epidemiological surveys of suicidal ideation, which of the following factors is not associated with increased suicidal ideation?

- A. Being female
- B. Being uneducated
- C. Being unmarried or separated
- D. Age between 25 to 44
- E. Having a psychiatric diagnosis

51. Which of the following terms refers to the number of new cases observed per person-year of observation?

- A. Cumulative incidence
- B. Incidence volume
- C. Incidence density
- D. Incidence velocity
- E. Incidence ratio

52. Which of the following is the main focus of the current (third) generation of epidemiological studies in mental health?

- A. To measure prevalence of the mental-health burden
- B. To measure the specific prevalence of individual disorders
- C. To measure the attitude of populations towards mental health
- D. To measure the burden of care faced by mental-health administrations
- E. To identify causal factors for severe mental illnesses

53. When unmet mental health-care needs in the UK are considered, which of the following is incorrect?

- A. Nearly 10% of the population have unmet need for treatment of a psychiatric disorder.
- B. Most unmet needs could be managed by a general practitioner.
- C. Less than half of all potential needs are met by health-care services.
- D. Huge investment in secondary care is required to meet the unmet needs.
- E. Unmet needs can be assessed using the Camberwell Assessment of Needs scale.

54. What is the estimated prevalence of adult ADHD according to the World Mental Health Survey Initiative?

- A. 3.4%
- B. 1.4%
- C. 34%
- D. 14%
- E. 8.4%

55. Which of the following measures the impact of premature mortality on a population?

- A. Crude mortality rate
- B. Disease-specific mortality
- C. Disability-adjusted life years
- D. Years of potential life lost
- E. Infant mortality rate

56. Which one of the following studies estimated the differences in incidence of psychosis in different ethnic groups in the UK?

- A. UK 700 study
- B. PRISM Psychosis study
- C. ESEMeD survey
- D. AESOP study
- E. UK household survey

57. According to epidemiological studies on the elderly population, the prevalence of mental disorders is estimated to be around

- A. 10%
- B. 2%
- C. 50%
- D. 5%
- E. 30%

58. Which of the following lifespan studies is secondary research of pooled data from epidemiological studies estimating the burden of psychopathology in an elderly population?

- A. NEMESIS
- B. DEPRES
- C. EURO-DEP
- D. Isle of Wight Study
- E. Epidemiological Catchment Area Study

59. With regard to psychiatric epidemiological studies of postpartum women, which of the following is false?

- A. Postpartum depression has no specific causal factors.
- B. Postpartum depression is not a continuum of postpartum psychosis.
- C. The Edinburgh postnatal depression scale is a self-rated scale.
- D. Postpartum psychosis occurs following around 1 per 1000 live-births.
- E. The recurrence rate of postpartum psychosis is about 1 in 10 pregnancies.

60. Considering the epidemiology of suicide in mental health-service users, in which of the following age groups are suicide rates higher in women than men?

- A. Less than 16
- B. 16 to 24
- C. 25 to 34
- D. Greater than 70
- E. None of the above

61. A new rating scale for anxiety that is under evaluation has a sensitivity of 80% and specificity of 90% against the standard ICD-10 diagnosis.

Which one of the following is correct?

- A. Out of 10 truly anxious patients eight will be correctly identified as anxious by the scale.
- B. Out of 10 truly anxious patients nine will be correctly identified as anxious by the scale.
- C. Out of 10 normal volunteers eight will be correctly identified as normal by the scale.
- D. Out of 10 people who test positive using the scale eight will have true anxiety.
- E. Out of 10 people who test negative using the scale four will have true anxiety.

62. Which of the following best describes a receiver-operator curve? It is often used to

- A. Decide the presence of publication bias
- B. Decide the optimal cut-off of a screening test
- C. Predict the likelihood of a negative result in diagnostic evaluation
- D. Measure the survival rates of inception cohorts
- E. Test the inter-rater reliability of a new instrument

63. A pilot develops acute manic episode while flying with 200 passengers. After nearly 2 hours of struggle by the rest of the crew, the flight is flown to safety. The 200 passengers are followed up for development of PTSD symptoms in the next 2 years. This study can be termed a

- A. Case-control study
- B. Cohort study
- C. Case series study
- D. Qualitative study
- E. Cross-sectional survey

- 64. From a nationwide, cross-sectional survey it was found that 8% of otherwise normal children experience auditory hallucinations by the age of 11. This 8% of the survey sample was followed up annually for next 20 years to detect incidence of schizophrenia. This group can be termed a/an**
- A. Inception cohort
 - B. Open cohort
 - C. Retrospective cohort
 - D. Random cohort
 - E. None of the above
- 65. X is strongly associated with Y. A study investigates whether X causes Y. Which one of the following weakens the claim for a causal association between X and Y?**
- A. Consistency of association between X and Y
 - B. Dose-response relationship between X and Y
 - C. X always precedes Y
 - D. U,V, and W are well-established effects of X
 - E. X and Y are biologically related phenomena
- 66. An astute old age psychiatrist wants to know the prevalence of dependent personality disorder among the elderly population in his catchment area. The most appropriate research method he will be employing is**
- A. Case-control study
 - B. Cohort study
 - C. Case series study
 - D. Qualitative study
 - E. Cross-sectional survey
- 67. Regarding the risk factors for adolescent alcohol problems, which of the following accounts for high attributable risk?**
- A. Externalizing symptoms in childhood
 - B. Maternal alcohol consumption
 - C. Poor school performance
 - D. Lack of friends
 - E. Being a single child

- 68. A new test being evaluated to predict treatment response in geriatric depression utilizes neuroimaging techniques. The overall results of the test are very close to that observed on longitudinal follow-up after treatment (gold standard) but individuals vary widely in the magnitude of the results produced. Which one of the following correctly describes the properties of this test?**
- A. Precise and accurate
 - B. Precise but not accurate
 - C. Not precise but accurate
 - D. Neither precise nor accurate
 - E. Accurate and sensitive
- 69. The lifetime prevalence of OCD is estimated to be around**
- A. 0.5–1%
 - B. 1–2 in 1000
 - C. 2–3%
 - D. 8–10%
 - E. 10–15%
- 70. The prevalence of diabetes is higher among people with schizophrenia. Which of the following statements is correct with respect to the association between diabetes and psychiatric disorders?**
- A. Diabetes is two to four times more prevalent in schizophrenia.
 - B. Patients with treatment-resistant schizophrenia are less likely to be screened for diabetes.
 - C. There is an unusually low rate of family history of type 2 diabetes in schizophrenia patients.
 - D. Rates of impaired glucose tolerance in drug-naïve first-episode schizophrenia is less than in the general population.
 - E. Schizophrenia is the only mental disorder showing an established association with diabetes.

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chapter 2

EPIDEMIOLOGY

ANSWERS

1.C. The incidence of a disease is defined as the number of 'new' cases diagnosed in a specified time interval for a specified size of population at risk. The midinterval population usually determines this population size. For example while calculating the incidence of a disease in 1 year, the comparison is made against the midyear population.

$$\text{Incidence in 2008} = \frac{\text{Number of newly diagnosed cases in 2008}}{\text{Mid 2008 population in an area}}$$

Incidence is a rate ratio, that is it is measured against time. It is not a mere number and it is usually expressed per 100 000 persons in a population, per year. The essential criterion is that the measure should indicate all new occurrences of a disease within the period of observation in an area, irrespective of whether the newly diagnosed patients are cured or dead within the period of observation itself. For an accurate measurement of incidence, two cross-sectional surveys must be carried out in the same population; one must be at the beginning of a defined period and the other at the end of the same period.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004: 175.

2.C. Lifetime prevalence is the proportion of individuals in the population who have ever manifested a disorder, who are alive on a given day. This is ascertained by surveying a population cross-sectionally and finding out if they ever satisfied the criteria for a disorder in the past or at the present time. As one can observe, although this method is commonly used in epidemiological surveys, it is prone to recall bias. Lifetime morbid risk refers to risk of contracting a disease for each individual in a birth cohort if they live long enough to reach the average life expectancy of the population. This must be clearly differentiated from prevalence estimates. Prevalence is largely a population measure, while lifetime morbid risk is more close to an individual's chances of being diagnosed with an illness.

Saha S, Chant D, Welham J, and McGrath J. A systematic review of the prevalence of schizophrenia. *PLoS Medicine* 2005; **2**: e141.

3.C. Incidence is a ratio between the number of newly diagnosed cases within a specified time period in a population and the total number of people living in the area (total population). To be accurate, such comparisons must exclude those who are not at risk, though this is generally not done for non-infectious, non-epidemic diseases such as psychiatric illnesses. It is essential that the denominator and numerator are not mutually exclusive, that is the diseased group must be a part of the studied population. Hence, when measuring the incidence of psychosis, the population above the age of 16 is the relevant denominator. The year 1981 is the midinterval period between 1965 and 1997.

Boydell J, Van Os J, Lambri M et al. Incidence of schizophrenia in south-east London between 1965 and 1997. *British Journal of Psychiatry* 2003; **182**: 45–49.

4.A. Prevalence is defined as the number of ‘existing’ cases in a specified population for a period of observation (either cross-sectional observation, called point prevalence, or longitudinal observation for a specified time, called period prevalence). The existing cases include all new cases and all cases diagnosed before the observation but still suffering from the disease, but existing cases excludes those who have been previously diagnosed but are now cured or dead. For illnesses that are significantly chronic (e.g. schizophrenia), prevalence will be higher compared to those illnesses that are acute and short lived (e.g. influenza), even if the incidence rates are comparable. Hence the simple expression

$$\text{prevalence} = \text{incidence} \times \text{duration of illness}$$

explains the relationship between incidence and prevalence.

Freeman J and Hutchison GB. Prevalence, incidence and duration. *American Journal of Epidemiology* 1980; **112**: 707–723.

5.C. Certain factors can influence incidence and prevalence differently. For example if a new vaccine is developed to prevent an illness, both incidence and prevalence may come down. If a cure is developed for schizophrenia, incidence may not be affected but prevalence could drop. Similarly, if interventions are introduced to reduce mortality in chronic schizophrenia, then prevalence may paradoxically increase due to longevity of patients. This may not affect incidence rates directly.

Higginson IJ and Constantin M. Epidemiology of symptoms in advanced illness. In: Max MB and Lynn J, eds. *Symptom Research: Methods and Opportunities*. <http://symptomresearch.nih.gov/tablecontents.htm> (accessed 19.8.08).

6.D. Mortality rates are a special type of incidence rates where ‘death’ is the defined ‘case’ of interest. Crude mortality rate is the ratio between number of deaths due to all cause in a population and total population size. Cause-specific mortality rate, for example alcohol-specific mortality, refers to the ratio between the number of deaths due to alcohol in a population and total population size. A standardized rate is a rate applicable to a hypothetical population with an adjusted variable, for example age. As population samples are heterogeneous, crude rates from one population may not be comparable to another population. For example suicide rates in inner London may not be comparable to rates in rural Yorkshire, as the working-age population may be higher in London, spuriously increasing suicide rates. Hence, standardized hypothetical populations are used on which observed rates from a population are applied and adjusted values are derived. These standardized values are easily comparable, but they are not subgroup incidence rates.

US Department of Health and Human Services. *Principles of Epidemiology*, 2nd edn. www2a.cdc.gov/phtn/catalog/pdf-file/Epi_Course.pdf (accessed 19.08.2008), p. 100.

7.B. Proportionate mortality rate is a measure of the contribution of a disease to societal mortality burden. It is given by the ratio between deaths due to a specific cause and total number of deaths in a population. Case fatality rate is the ratio between the number of deaths due to a specific disease and number of persons affected by the disease in a population. It is a measure of the fatal severity of the disease studied. For example 15 patients out of 100 with anorexia will die due to its complications. Choice A refers to cause-specific mortality rate while choice D refers to case fatality rate.

US Department of Health and Human Services. *Principles of Epidemiology*, 2nd edn. www2a.cdc.gov/phtn/catalog/pdf-file/Epi_Course.pdf (accessed 19.08.2008), p. 100.

8.A. The true value of the number of deaths in a population is obtained using crude mortality figures. Both standardized and crude rates are expressed in the same units of incidence. Standardized rates are not the same as specific rates. Disease-specific rates can give an idea about cause of death in a population. Standardized rates increase comparability, not the accuracy of measurement of mortality in a population.

US Department of Health and Human Services. *Principles of Epidemiology*, 2nd edn. www2a.cdc.gov/phtn/catalog/pdf-file/Epi_Course.pdf (accessed 19.08.2008), p. 100.

9.B. This is an example of cause-specific (suicide is the cause) mortality rate in a population (number of schizophrenia patients). If the comparison is between the number of patients died with a diagnosis of schizophrenia and total number of patients at a given time interval, then this becomes case fatality rate for schizophrenia. If deaths due to suicides in a population with schizophrenia are compared with all-cause deaths in the same population then this will be proportionate mortality due to suicide. A 'case' of suicide cannot be identified alive, though patients who attempted suicides can be identified. So describing a 'case' fatality rate for suicide is meaningless. Nevertheless, method-specific case fatality can be derived for various modes of suicide attempts.

US Department of Health and Human Services. *Principles of Epidemiology*, 2nd edn. www2a.cdc.gov/phtn/catalog/pdf-file/Epi_Course.pdf (accessed 19.08.2008), p. 100.

10.D. In large epidemiological studies, a consistent 1.5% prevalence is quoted for bipolar disorders. It is unclear whether there is an over-inclusion of depressive disorders and under-diagnosis of bipolar type 2 disorder in these surveys. Hypomania, being positively appraised by patients themselves, is often missed in structured, non-clinician interviews. Angst *et al.*, in a 20-year-long prospective study, observed that patients with depression and clinically undiagnosed subsyndromal hypomania have similar risk factors, course, and outcome compared to bipolar disorder type 2.

Angst J, Gamma A, Sellaro R *et al*. Recurrence of bipolar disorders and major depression. A life-long perspective. *European Archive of Psychiatry and Clinical Neuroscience* 2003; **253**: 236–240.

11.C. According to NESARC (National Epidemiological Survey of Alcoholism and Related Conditions) the mean age of onset of depression is 30 years, the mean number of episodes in patients with lifetime major depressive disorder is five, and the mean age of treatment onset for depression is 33.5 years. This lag of around 3 years is noted in other community samples that studied treatment seeking for depression. It is currently unclear if untreated depression, as noted in population surveys, affects clinical outcome in long-term follow-up.

Hasin DS, Goodwin RD, Stinson FS *et al*. Epidemiology of major depressive disorder: Results From the National Epidemiologic Survey on Alcoholism and Related Conditions. *Archives of General Psychiatry* 2005; **62**: 1097–1106.

12.D. Nearly 40% of depressive episodes do not come to clinical attention even in developed nations (NESARC study). The World Mental Health Survey initiative organized by the WHO revealed that older generational cohorts of depressed people, men, those with earlier age of depression onset, and those who are living in developing compared to developed countries are poor seekers of treatment for depression. The situation is even worse for anxiety and substance-use disorders. An encouraging finding was that those with severe illness sought treatment more often than those with milder illnesses.

WHO World Mental Health Survey Consortium. Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization World Mental Health Surveys. *JAMA* 2004; **291**: 2581–2590.

13. C. The most common comorbidities with depression in epidemiological surveys are alcohol use (>40%) and anxiety (>40%). It is noted that cluster C personality disorders, with the exception of obsessive compulsive personality disorder, show strong associations with lifetime major depression in large-scale community surveys. In Question 13, choice A refers to cluster A personality, choice B to cluster B, and choice C to two of the three cluster C personality disorders. Choice D includes disorders described in DSM IV but not clustered in any of the three groups.

Hasin DS, Goodwin RD, Stinson FS et al. Epidemiology of major depressive disorder: Results From the National Epidemiologic Survey on Alcoholism and Related Conditions. *Archives of General Psychiatry* 2005; **62**: 1097–1106.

14. E. It is important to note that the prevalence of personality disorders in those who attend psychiatric services or primary-care services are higher than community prevalence rates. The rate of personality disorders is recorded to be very high in institutions such as prisons and psychiatric hospitals providing long-term services. The prevalence of any personality disorder in community samples is estimated to be around 13% in the UK. The comorbid association of diagnosable personality disorder and depression was explored in NESARC study, which revealed 30% of depressed patients in the community have a comorbid personality disorder.

Hasin DS, Goodwin RD, Stinson FS et al. Epidemiology of major depressive disorder: Results From the National Epidemiologic Survey on Alcoholism and Related Conditions. *Archives of General Psychiatry* 2005; **62**: 1097–1106.

15.A. This is called capture–recapture technique. It is useful in estimating the size of a population that cannot be directly estimated as only a fraction is observable when using sampling techniques. Initially, a random sample from the population of interest is drawn (e.g. mentally ill homeless population). After registering these patients they are allowed to mix with the population (using a registration tag, they can be identified again). When complete mixture with the total population has occurred, a second random sample is drawn. From the prevalence of the registered patients in the second sample, the size of the total population may be calculated. This technique is being used in animal research to provide estimates of census of animals.

Burger H and Neeleman J. A glossary on psychiatric epidemiology. *Journal of Epidemiology and Community Health* 2007; **61**: 185–189.

16. B. The term comorbidity refers to the existence of two different diagnoses at the same time in an individual. In psychiatric epidemiology, comorbidity is a rule rather than exception. This high degree of comorbidity is partly due to the overlapping nature of diagnostic entities in psychiatry. Comorbidity in epidemiological research throws light onto possible aetiological underpinnings and meaningful outcome variables. Feinstein coined the term comorbidity. The various types of comorbidity are:

1. Episode (concurrent) comorbidity
2. Lifetime comorbidity
3. Coincidental comorbidity (co-occurrence by chance)
4. Associative comorbidity (risk factor or causal link).

Burger H and Neeleman J. A glossary on psychiatric epidemiology. *Journal of Epidemiology and Community Health* 2007; **61**: 185–189.

17.A. The rigorous, systematic review mentioned in the question was carried out by McGrath and colleagues. Prior to this, in 1986, the WHO published results from the International Pilot Study on Schizophrenia from seven countries; incidence of ICD 9 schizophrenia was estimated to be around 16 to 42 per 100 000 in a year. When schizophrenia was narrowly defined, this rate dropped to 7 to 14 per 100 000. McGrath et al. showed a fivefold difference in the incidence rates of schizophrenia across various sites in their systematic review and meta-analysis of various epidemiological studies on schizophrenia. According to this work, it is concluded that the median global incidence rate of schizophrenia is 15 per 100 000; but this global rate is not as meaningful as site-specific rates due to the degree of variation demonstrated. This view is endorsed by the AESOP study, which showed significant variation in incidence of schizophrenia among three major cities in England.

McGrath J, Saha S, Welham J et al. A systematic review of the incidence of schizophrenia: the distribution of rates and the influence of sex, urbanicity, migrant status and methodology. *BMC Medicine* 2004; **2**: 13.

Kirkbride JB, Fearon P, Morgan C et al. Heterogeneity in incidence rates of schizophrenia and other psychotic syndromes: findings from the 3-center AESOP study. *Archives of General Psychiatry* 2006; **63**: 250–258.

18. B. The male to female difference in incidence of schizophrenia is estimated to be around 1.4: 1, with more males being diagnosed with the disease. The male excess persists even when factors such as age range and diagnostic criteria are taken into account; but interestingly this difference is not borne out when considering prevalence rates, suggesting that different factors exist in predisposing and perpetuating the illness. It may be related to males having higher mortality rates than females with schizophrenia or increased predominance of females in late-onset schizophrenia.

McGrath JJ. The surprisingly rich contours of schizophrenia epidemiology. *Archives of General Psychiatry* 2007; **64**: 14–16.

19. C. Being born in an urban area increases the risk of schizophrenia twofold compared to individuals born in a rural area. Living in a city is also noted to increase incidence of schizophrenia. The incidence of schizophrenia is three to five times more common in migrants than a native population (median 4.6); this difference reduces to 1.8 when considering prevalence rates. Fluctuations in schizophrenia incidence have been reported over many decades. This may be related to changing structure of the population. Irrespective of broad or narrow definitions, the incidence of schizophrenia has definitely increased in certain urban areas over the last 40 years.

McGrath J, Saha S, Welham J, et al. A systematic review of the incidence of schizophrenia: the distribution of rates and the influence of sex, urbanicity, migrant status and methodology. *BMC Medicine* 2004; **2**: 13.

20. B. Lifetime prevalence needs to be distinguished from lifetime morbid risk (LMR). LMR is the probability of a person developing the disorder during entire period of their life (often a specified period, defined by the life expectancy of the population studied). LMR includes the entire lifetime of a birth cohort, both past and future, and includes those deceased at the time of the survey.

Saha S, Chant D, Welham J, and McGrath J. A systematic review of the prevalence of schizophrenia. *PLoS Medicine* 2005; **2**: e141.

21.B. For low-incidence disorders such as schizophrenia, summation of age-specific incidence rates gives approximate lifetime morbid risk values. The lifetime morbid risk for schizophrenia is 7.2/1000.

Saha S, Chant D, Welham J, and McGrath J. A systematic review of the prevalence of schizophrenia. *PLoS Medicine* 2005; **2**: e141.

22.A. The median prevalence of schizophrenia was 4.6/1000 for point prevalence, 3.3/1000 for period prevalence, and 4.0/1000 for lifetime prevalence. There were no significant differences observed between males and females, or between urban, rural, and mixed sites with respect to the prevalence rates of schizophrenia. Migrants and homeless people had higher rates of schizophrenia and developing countries had lower prevalence rates.

Saha S, Chant D, Welham J, and McGrath J. A systematic review of the prevalence of schizophrenia. *PLoS Medicine* 2005; **2**: e141.

23.D. The lifetime morbidity risk estimated for schizophrenia is around 7 per 1000 people in the population.

Saha S, Chant D, Welham J, and McGrath J. A systematic review of the prevalence of schizophrenia. *PLoS Medicine* 2005; **2**: e141.

24.D. Population attributable fraction refers to the proportion of a disease in the whole population that the group exposed to specific risk factors represents. It is calculated by finding out the difference between incidence rates in the total population and the exposed population, and expressing this difference as a proportion of the total population's incidence rate. It is different from simple attributable risk, which expresses the difference in incidence rates between the exposed and non-exposed groups. Winter/ spring birth increases the risk of schizophrenia to a small extent (RR 1.11), but as the prevalence of birth itself is common in winter/ spring, 10.5% of all schizophrenia incidences can be attributed to the seasonal birth. The winter/ spring excess is positively associated with latitude.

McGrath JJ. Variations in the incidence of schizophrenia: data versus dogma. *Schizophrenia Bulletin* 2006; **32**: 195–197.

25.D. If the measurement methodologies differ between how a case is ascertained for incidence and prevalence, then such differences will be uniformly present across various sites. Recall bias will not influence incidences measured using case notes or case registers. On the other hand, lifetime prevalence rates are susceptible to recall bias. Respondent bias, if present, must again operate uniformly and should affect various areas consistently, provided the same methods are used. A fatal disease must reduce prevalence rates uniformly. The most likely explanation is that the factors predisposing or precipitating the onset are different from the factors that serve to maintain the illness chronicity.

Saha S, Chant D, Welham J, and McGrath J. A systematic review of the prevalence of schizophrenia. *PLoS Medicine* 2005; **2**: e141.

26.A. ESEMeD was the first major multicentre European psychiatric epidemiological study; it was not conducted in the UK. It used both Composite International Diagnostic Interview (CIDI) version 3.0 (WHO) and Structured Clinical Interview for DSM Disorders (SCID) based clinical diagnosis (DSM IV criteria). ESEMeD is a part of the World Mental Health Survey Initiative of the WHO. The results showed that 1 in 4 adults in Europe had a lifetime presence of a mental disorder and 1 in 10 had a mental disorder in the last year; 14.7% had a lifetime history of mood disorder (major depression only, 13%), while 14% had anxiety (specific phobia only, 8%), and 5.2% had a lifetime alcohol-use disorder. The highest rate of mental disorder was in the age group 18–24.

Alonso J and Lepine JP. Overview of key data from the European Study of the Epidemiology of Mental Disorders (ESEMeD). *Journal of Clinical Psychiatry* 2007; **68** (Suppl. 2): 3–9.

27.D. Also called the filter model, the 'pathways of care' model was developed by Goldberg and Huxley to account for how mental illness interacts with the health-care system. Five levels of mental illness occurrence were described: the community, the primary-care attendees, the correctly diagnosed primary-care attendees (in whom the mental illness has been recognized), the level of the psychiatrist, and that at the level of psychiatric in-patient care. Four filters explain the decreasing incidence when going from the general population to in-patient psychiatric care:

1. At the level of the patient himself or herself (recognition)
2. At the level of the general practitioner (recognition, decision to treat, decision to refer)
3. At the out-patient level of the mental health-care system
4. At the in-patient admission level.

Occupational health resources are not major filters in this model.

Burger H and Neeleman J. A glossary on psychiatric epidemiology. *Journal of Epidemiology and Community Health* 2007; **61**: 185–189.

28.A. Persistence is defined as the total number of patients with lifetime prevalence of a disorder who also satisfy a defined period prevalence, say 12 months, criteria at the time of survey. It is a measure of illness chronicity, response to treatment, and burden.

Burger H and Neeleman J. A glossary on psychiatric epidemiology. *Journal of Epidemiology and Community Health* 2007; **61**: 185–189.

29.B. The Epidemiological Catchment Area study (ECA) was an investigation of the prevalence of psychiatric morbidity which was undertaken during 1976–80 in five sites in the USA. More than 20 000 people were interviewed using the Diagnostic Interview Schedule (DIS). ECA is regarded as a milestone study in psychiatric epidemiology, after which a new generation of epidemiological enquiry concentrating on community samples flourished. However, ECA was criticized for its use of lifetime diagnoses, which may be unreliable due to recollection bias. DIS was the foremost laypersonusable diagnostic instrument designed for psychiatric diagnoses.

Burger H and Neeleman J. A glossary on psychiatric epidemiology. *Journal of Epidemiology and Community Health* 2007; **61**: 185–189.

30.E. The differential outcome of schizophrenia between developed and developing nations was first highlighted through the results of the International Pilot Study on Schizophrenia conducted by the WHO (IPSS). IPSS assessed 1202 persons diagnosed with schizophrenia in nine countries. The results showed that persons with schizophrenia in the 'developing' world (e.g. Columbia, India, and Nigeria) had better outcomes than persons in 'developed' countries (e.g. Moscow, London, Washington, Prague, and Aarhus in Denmark). In total, 52% of persons in the developing countries were assessed to be in the 'best' outcome category (defined as a single episode only, followed by full or partial recovery) compared with 39% in the developed countries. There was a claim that acute onset of psychosis, being more common in the developing nations, confounded the IPSS results, but a subsequent, large-scale, multinational study sponsored by WHO, excluded mode of onset as being a confounding factor for the observed differences in outcome. Differential follow-up rates, differential outcome measures, differential sex and age distribution, and diagnostic ambiguities did not confound the above results, as proved later by Hopper and Wanderling.

Hopper K and Wanderling J. Revisiting the developed versus developing country distinction in course and outcome in schizophrenia: results from ISoS, the WHO collaborative follow-up project. *International Study of Schizophrenia. Schizophrenia Bulletin* 2000; **26**: 835–846.

31.B. Determinants of Outcome of Severe Mental Disorder and the reduction of disability study (DOSMeD) was conducted by WHO primarily to explore the nature of the differential outcome between developed and developing nations shown by the International Pilot Study of Schizophrenia (IPSS). DOSMeD used more rigorous criteria and followed more than 1300 patients in 10 countries and, similar to the IPSS, discovered that the highest rates of recovery occurred in the developing world. The Netherlands Mental Health Survey and Incidence Study (NEMESIS study) was not a multinational study. DEPRES stands for Depression Research in European Society study. DEPRES was the first pan-European, six-country, multinational study on the prevalence of depression in the general population.

Lepine JP, Gastpar M, Mendlewicz J, and Tylee A. Depression in the community: the first pan-European study DEPRES (Depression Research in European Society). *International Clinical Psychopharmacology* 1997; **12**: 19–29.

Edgerton RB and Cohen A. Culture and schizophrenia: the DOSMD challenge. *British Journal of Psychiatry* 1994; **164**: 222–231.

32.A. The WMH Survey Consortium was formed in 1998 and 28 countries were included in a large, ambitious population survey across countries at different economical stages of development. The method employed was a multistage household probability survey. Important findings from the WMH survey initiative were:

1. Prevalence of mental disorders varies widely across countries.
2. Anxiety disorder is the most common (except Ukraine), followed by mood disorders (except Nigeria and Beijing where substance use was joint second).
3. The USA has highest prevalence rate for any disorder.
4. In all surveyed countries, severity was associated with treatment seeking. Those in developed countries obtained more treatment than those in developing nations.
5. Interestingly, a substantial proportion of non-cases were receiving treatment. This proportion was more in developed than less developed nations. This meant that most people receiving treatment are either mild cases or non-cases and not severely ill.

WHO World Mental Health Survey Consortium. Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization World Mental Health Surveys. *JAMA* 2004; **291**: 2581–2590.

33.C. ESEMeD is the first major, multicentre, European psychiatric epidemiological study. ESEMeD is a part of World Mental health survey initiative of the WHO. Six European countries (not including the UK) were surveyed and a 60% response rate was achieved. The results showed that the highest rate of mental disorder was in the age group 18–24. Notably, while surveys such as NCS and NEMESIS excluded elderly populations, ESEMeD had nearly one in two respondents over 65 years of age.

ESEMeD/MHEDEA 2000 Investigators. Prevalence of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. *Acta Psychiatrica Scandinavia* 2004; **109** (Suppl. 420): 21–27.

34.A. According to the ESEMeD survey, only 37% of Europeans with mood disorders and 21% with anxiety disorders sought help from health-care services. Only 21% of depressed patients received antidepressants in a year. One-third of identified cases had consulted their general practitioner in the preceding 12 months. Nearly one-third of those who sought help had never seen a mental health professional. Nearly 21% remained untreated in spite of seeking help. Comorbidity significantly influenced disability and functional impairment.

ESEMeD/MHEDEA 2000 Investigators. Prevalence of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. *Acta Psychiatrica Scandinavia* 2004; **109** (Suppl. 420): 21–27.

35.B. Panic can exist in different forms. Major classification systems recognize panic disorder, agoraphobia, and comorbid panic disorder with agoraphobia. DSM considers panic disorder as a primary dysfunction while ICD focuses on agoraphobia. To diagnose panic disorder there must be frequent panic attacks within a specified time interval. It is increasingly realized that panic attacks can occur without fully satisfying panic disorder criteria. The National Comorbidity Survey Replication (NCS-R) collected data on four composite groups: isolated panic attacks, panic attacks with agoraphobia, panic disorder, and panic disorder with agoraphobia. Lifetime prevalence of panic attacks was only 28% compared to 4.7% who had a diagnosis of lifetime panic disorder only. Panic with agoraphobia had around 1% lifetime prevalence.

Kessler RC, Chiu WT, Jin R et al. The epidemiology of panic attacks, panic disorder, and agoraphobia in the National Comorbidity Survey Replication. *Archives of General Psychiatry* 2006; **63**: 415–424.

36.A. ESEMeD revealed the degree of unmet health-care needs in Europe. A significant number of those with depression do not seek treatment. Of those depressed patients who seek help, most receive care from primary-care physicians. Only 21% of those who seek health-care support have seen a psychiatrist in the last 12 months.

Alonso J, Kovess V, Angermeyer MC et al. Population level of unmet need for mental healthcare in Europe. *British Journal of Psychiatry* 2007; **190**: 299–306.

37.A. According to the National Comorbidity Survey Replication, mean age of onset of any panic attack irrespective of diagnosis is around 22 years.

Kessler RC, Chiu WT, Jin R et al. The epidemiology of panic attacks, panic disorder, and agoraphobia in the National Comorbidity Survey Replication. *Archives of General Psychiatry* 2006; **63**: 415–424.

38.D. As a general rule, all anxiety disorders are more common in women than men. Notable exceptions are OCD and social phobia. OCD is more common in boys than girls, but equally common in adult men and women. Men outnumber women in seeking treatment for social phobia. It is not clear whether men suffer from a more severe form of social phobia or the level of impairment caused by social phobia is more for men than women.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 597.

39.A. The estimated lifetime prevalence of blood–injection–injury phobia is around 3.5%. The median age of onset is around 5 to 6 years. Subjects with blood–injection–injury phobia have higher lifetime histories of fainting and seizures. Prevalence was lower in the elderly and higher in females and persons with less education. Patients with this phobia almost never seek psychiatric help, but they have significantly higher than expected lifetime prevalence of other psychiatric conditions, including substance use, depression, anxiety disorders, and OCD.

Bienvenu OJ and Eaton WW. The epidemiology of blood-injury-injection phobia. *Psychological Medicine* 1998; **28**: 1129–1136.

40.A. Reliability of diagnostic instruments used for interviews in epidemiological surveys will not change by having two independent observers, if the instrument is self-rated by the patients themselves. Similarly, descriptive responses could lower the reliability as they are prone to errors of interpretation. Having a short questionnaire and spending more than usual time on a questionnaire are not useful strategies to improve the reliability. According to psychometric principles, the reliability of an instrument could be increased, to a certain degree, if the number of questions regarding the same theme is increased. This was effectively utilized by the Stirling County Study when revising the instrument used to detect depression between 1950 and 1970.

Murphy JM, Laird NM, Monson RR et al. A 40-year perspective on the prevalence of depression: the Stirling County Study. *Archives of General Psychiatry* 2000; **57**: 209–215.

41.C. The Stirling County Study is one of the foremost psychiatric epidemiological studies. It was conducted on cross-sectional samples of the population living in Stirling County, Canada, in 1952, 1970, and 1992. The epidemiological data was revisited in 2000 and it showed that vernacular changes in semantic use of terms such as dysphoria could affect results of epidemiological surveys. Using the same diagnostic system (called DPAX-1) in 1952 and 1970, no increases in point prevalence of depression were noted, but when the same criteria were employed in 1992 a drop in prevalence was noted. This was due to a change in use of the term dysphoria in the studied population; this term went out of use by 1992, leading to a drop in the sensitivity of the diagnostic instrument DPAX-1. By increasing the number of questions exploring the mood state and changing the diagnostic system (to DPAX-2), similar prevalence rates were detected in 1992. Note that though the diagnostic categories changed between 1952 and 1992 this did not have a direct influence on the Stirling County Survey, which used a purpose-built instrument to measure the prevalence.

Murphy JM, Laird NM, Monson RR et al. A 40-year perspective on the prevalence of depression: the Stirling County Study. *Archives of General Psychiatry* 2000; **57**: 209–215.

42. C. Various studies, including NCS and its replication NCS-R, NESARC (National epidemiological Survey on Alcohol and Related Conditions) and ECA (Epidemiological Catchment Area Study), have implicated that lifetime prevalence of depression is changing. The Stirling County Study did not reveal such a significant change in rates of depression. This apparent change in prevalence could be attributed to the use of different diagnostic instruments. DIS (Diagnostic Interview Schedule), used in the ECA, and its modified improvised versions used in other studies relied on recall of lifetime prevalence. Significant recall bias is expected for a progressively older cohort who will deny or could not recall their depressive episodes. This might have resulted in a spurious effect. NCS used DSM IIIR (10.1% depression 12-month period prevalence) while its replication used DSM IV (8.7% depression prevalence), with its clinical impairment and distress criteria making it possible that less patients will be diagnosed with DSM IV. In fact, it was later shown that if DSM IV criteria were reapplied then prevalence of depression drops from 10.1% to 6.4% in the NCS 1994. In addition, NCS excluded all those above age 54 but included a 15 to 17 age group (in contrast to NCS-R), inadvertently choosing the most prevalent population that might have inflated the prevalence value. These flaws were absent in NESARC, which showed nearly doubled point prevalence estimate of depression from 3.3 to 7% from 1992 to 2002.

Hasin DS, Goodwin RD, Stinson FS et al. Epidemiology of major depressive disorder: Results From the National Epidemiologic Survey on Alcoholism and Related Conditions. *Archives of General Psychiatry* 2005; **62**: 1097–1106.

43.A. A nationally representative sample of nearly 8500 adults aged 16–74 years living in private households in Great Britain were interviewed by lay interviewers and were classified according to their score on the Clinical Interview Schedule-Revised (Psychiatric morbidity survey, Office of National Statistics). The Psychosis Screening questionnaire was used to collect self-reported symptoms of psychosis. In the sample, 4.2% said that there had been times when they heard or saw things that other people could not, but only 0.7% reported hearing voices saying quite a few words or sentences when there was no-one around that might account for it.

Johns LC, Singleton N, Murray RM et al. Prevalence and correlates of self-reported psychotic symptoms in the British population. *British Journal of Psychiatry* 2004; **185**: 298–305.

44. B. In the Office of National Statistics-Psychiatric Morbidity Survey in the UK, a self-reported instrument, called the Psychosis Screening Questionnaire, was used to detect self-reported psychotic symptoms. The questionnaire measured symptoms in five domains, namely, hallucinations, hypomania, strange experiences, paranoia, and thought insertion. Nearly half of the respondents thought that they experienced at least one hypomanic symptom when questioned, but, when explored further, more than half of the respondents had valid reasons for feeling very happy for many days without a break. Only 0.6% reported their friends or relatives commenting on such a prolonged ‘happy’ state.

Johns LC, Singleton N, Murray RM et al. Prevalence and correlates of self-reported psychotic symptoms in the British population. *British Journal of Psychiatry* 2004; **185**: 298–305.

45. C. Surveys of preschool children have recorded a high prevalence of problem behaviours. The most commonly reported problem is that of bedwetting, seen in around 37% of a sample. Boys and girls show equal prevalence of these problems while those with expressive language disorders show more behavioural difficulties. Maternal depression and family discord at 3 years strongly predict behavioural disorder by the age of 8.

Richman N, Stevenson J, and Graham P. Prevalence of behaviour problems in 3 year old children: An epidemiological study in a London borough. *Journal of Child Psychology and Psychiatry* 1975; **16**: 277–287.

46.A. The Isle of Wight Study was one of the earliest epidemiological studies on children, carried out by Rutter *et al.* in 1960. In this study, all 10- to 11-year-old children in the Isle of Wight were surveyed using both parent and teacher questionnaires separately. A 5.7% prevalence of diagnosable psychiatric disorders was identified. Boys had more problems than girls in the ratio 2: 1. But only 10% of these children were known to psychiatric services at the time of this study.

Rutter M, Tizard J, Yule W *et al.* Research report: Isle of Wight Studies, 1964–1974. *Psychological Medicine* 1976; **6**: 313–332.

47. B. It is observed that adolescents have more psychiatric difficulties than younger children. The Isle of Wight Study was repeated when the cohort was around 14–15 years of age and the prevalence of psychiatric disorders was found to have increased from 5.7% to 8%. Marital disharmony predicted development of psychiatric problems by adolescence. A similar study carried out using a cohort followed up at Dunedin, New Zealand, revealed similar results.

Graham P and Rutter M. Psychiatric disorder in the young adolescent. *Proceedings of the Royal Society of Medicine* 1973; **66**: 1226–1229.

McGee R, Feehan M, Williams S *et al.* DSM-III disorders in a large sample of adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry* 1990; **29**: 611–619.

48. E. In most of the large-scale epidemiological surveys of the last two decades, screening is carried out in a population sample using layperson-administered, structured tools to identify ‘caseness’. This is later followed by clinician-led diagnostic assessment to confirm such cases. It has been shown repeatedly that layperson diagnostic instruments diagnose more mental illness than those identified by clinician administered, standardized instruments. The agreement between these two types of diagnostic tools is poor, around a kappa of 0.1 to 0.4 only, but no single instrument can be claimed to be superior for case ascertainment purposes.

Brugha T, Bebbington PE, Jenkins R *et al.* Cross validation of a general population survey diagnostic interview: a comparison of CIS-R with SCAN ICD-10 diagnostic categories. *Psychological Medicine* 1999; **5**: 1029–1042.

49. D. Using the data from 17 countries that participated in the WMH survey initiative, the cross-national lifetime prevalence of suicidal ideation is estimated to be 9.2%. Planning for suicide is estimated to occur in 3.1% while actual attempts take place in 2.7% of the sample; 60% of transitions from ideation to plan and attempt occur within the first year after ideation onset. Consistent, cross-national risk factors included being female, younger, less educated, unmarried, and having a mental disorder.

Nock MK, Borges G, Bromet EJ *et al.* Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *British Journal of Psychiatry* 2008; **192**: 98–105.

50. D. The significant risk factors strongly related to suicidal ideation in cross-sectional samples are being female, previously married, age less than 25 years, being poorly educated, and having one or more diagnosable psychiatric disorders. These risk factors are strongly associated with suicidal ideation rather than conversion of ideas to attempts. In fact, suicides are more common in men than women across all age groups.

Nock MK, Borges G, Bromet EJ et al. Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *British Journal of Psychiatry* 2008; **192**: 98–105.

51. C. The term incidence density refers to the number of new cases observed in a defined period in a population per person-year of observation.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004, p. 660.

52. B. To describe the development of psychiatric epidemiology, three 'generations' of studies are distinguished. Around 16 psychiatric epidemiological studies, carried out before World War II, belong to the first generation. These studies focused primarily on the health-care agency-registered prevalence of mental disorders in relation to community characteristics. The second generation of psychiatric epidemiological studies followed an increased interest in the diagnostic criteria, classification, and nomenclature of psychiatric disorders after World War II, when nearly 60 studies appeared. These were mainly field surveys, conducted in unstructured clinical interviews. Consequently, the reliability of these studies was low. The third-generation studies started around 1970, with more effort put into increasing the reliability of psychiatric diagnoses. A major objective of the third-generation studies is to obtain precise estimates of prevalence and incidence of specific mental disorders, whereas second-generation studies focused on mental ill-health in general. It is claimed that a fourth generation of psychiatric epidemiological studies is in the making. This includes studies that include comprehensive sets of biological markers such as brain imaging, cerebrospinal fluid examinations, blood sampling, etc. in the large-scale, cross-sectional surveys.

Burger H and Neeleman J. A glossary on psychiatric epidemiology. *Journal of Epidemiology and Community Health* 2007; **61**: 185–189.

Skoog I. Psychiatric epidemiology of old age: the H70 study—NAPE lecture 2003. *Acta Psychiatrica Scandinavica* 2004; **109**: 4–18.

53. D. Using the Camberwell Assessment of Needs Schedule, Bebbington et al. determined the unmet need for psychiatric care to be around 10% of the sample assessed from inner south London. Less than half of all potentially achievable needs were met in this sample. There was only partial overlap between diagnosis and an adjudged need for treatment, that is there was a significant section of the sample that had a need for treatment irrespective of diagnostic categorization. It was concluded that most of these needs could be met at the primary care level.

Bebbington PE, Marsden L, and Brewin CR. The need for psychiatric treatment in the general population: The Camberwell needs for care Survey. *Psychological Medicine* 1997; **27**: 821–834.

54.A. As a part of the WMH Survey Initiative, adult respondents were screened for criteria of ADHD in a cross-national sample. The estimates of ADHD prevalence averaged 3.4%, with lower prevalence in lower income countries (1.9%) compared with higher-income countries (4.2%). A high degree of comorbidity was noted for adult ADHD, and, interestingly, in most low-income countries the comorbidities were treated more than the ADHD itself. The treatment for adult ADHD was better in developed countries.

Fayyad J, De Graaf R, Kessler RC et al. Cross-national prevalence and correlates of adult attention-deficit hyperactivity disorder. *British Journal of Psychiatry* 2007; **190**: 402–409.

55. D. ‘Years of potential life lost’ (YPLL) is a measure of the impact of premature mortality on a population. It is calculated as the sum of the differences between some predetermined end point (commonly the life expectancy of population or age 65 as standard) and the ages of death for those who died before that end point. Crude mortality is not specific for age distribution of mortality. The infant mortality rate does not pick up deaths occurring after 1 year of age.

US Department of Health and Human Services. *Principles of Epidemiology*, 2nd edn. www2a.cdc.gov/phtn/catalog/pdf-file/Epi_Course.pdf (accessed 19.08.2008), p. 112.

56. D. AESOP (Aetiology and Ethnicity study of Schizophrenia and other Psychoses) was a UK-based study on the incidence of psychosis in three major cities—London, Nottingham, and Bristol. AESOP explored ethnicity differences in the incidence of psychosis in these cities and found that all psychoses were more common in the black and minority ethnic group, with an incidence rate ratio of 3.6. When adjusted statistically for confounding factors, this reduced to an adjusted incidence rate ratio of 2.9. It was also noted that the incidence of all psychoses was higher in south-east London than Bristol or Nottingham. The UK700 study explored the differences in outcome between various types of service delivery, that is community teams and assertive outreach models. The PRISM psychosis study analysed the effect of setting up community treatment teams on various outcomes and satisfaction measures for service users.

Morgan C, Dazzan P, Morgan K et al. First episode psychosis and ethnicity: initial findings from the AESOP study. *World Psychiatry* 2006; **5**: 40–46.

57. E. Lifespan surveys across elderly population are limited. The H70 study refers to a meticulous, large-scale, longitudinal data collection from individuals over age 70 (born 1901–1902, observations started in 1971) in Sweden. It included detailed examinations of ageing and age-related somatic and psychiatric disorders, such as physical examinations performed by geriatricians, electrocardiograms, chest X-rays, a battery of blood tests, nutritional factors, anthropometric measurements, psychosocial background factors, and psychometric tests performed by psychologists. It has provided a rich source of data on elderly populations in Europe. The psychiatric data available from the H70 show that approximately 30% of those older than 75 years have mental disorders of some form.

Skoog I. Psychiatric epidemiology of old age: the H70 study—NAPE lecture 2003. *Acta Psychiatrica Scandinavica* 2004; **109**: 4–18.

58. C. EURO-DEP is a European consortium to study the epidemiology of depression in later life. This utilizes a secondary research method wherein existing datasets on epidemiology in late-life depression are pooled and a new instrument, called EURO-D, to diagnose depression using the various heterogeneous scales from these studies has been devised. The EURO-D scale was developed from 12 items of the Geriatric Mental State and validated against other scales and expert diagnosis. Meta-analysis of nearly 14 000 subjects interviewed in various studies using the Geriatric Mental State, yielded a mean level of depression of 12.3%; the prevalence in women was 14.1% and men 8.6%. DEPRES (Depression Research in European Society) is the first large, pan-European survey of depression in the community. It is not secondary research. The Netherlands Mental Health Survey and Incidence Study (NEMESIS) is a prospective study of the prevalence, incidence, and course of psychiatric disorders in a sample of Dutch adults aged 18 to 64.

Copeland JRM, Beekman ATF, Braam AW et al. Depression among older people in Europe: the EURODEP studies. *World Psychiatry* 2004; **3**: 45–49.

59. E. Postpartum depression has no specific causal factors. Though numerous risk factors, such as social isolation and adverse life events, are associated with the incidence of postnatal depression, none of these factors are specific enough to differentiate postnatal depression from depression occurring during other phases of a woman's life. Depression is common in perimenopausal, peripubertal, and child-rearing or pregnant women. Postpartum depression is essentially same disease as major depression occurring at other times, with respect to its classificatory status. Postpartum depression is not a continuum of postpartum psychosis, which is more closely associated with bipolar illness. The Edinburgh Postnatal Depression Scale is a self-rated scale with 10 items. It is a screening tool for detecting depression in mothers. Postpartum psychosis occurs following around 1 per 1000 live births. The recurrence rate of postpartum psychosis is about 1 in 4 subsequent pregnancies.

Brockington P. Post partum psychiatric disorders. *Lancet* 2004; **363**: 303–310.

60. E. Suicide rates in male mental health-service users are always higher than female service users irrespective of the age group. The male: female suicide rate is around 3: 1. The gender difference is most pronounced at age 25 to 34, where nearly 80% are males. The divide is less steep in those more than 75 years of age where nearly 60% are males.

Swinson N, Ashim B, Windfuhr K et al. National confidential inquiry into suicide and homicide by people with mental illness: new directions. *Psychiatric Bulletin* 2007; **31**: 161–163.

61.A. Sensitivity of a diagnostic test refers to the proportion of diseased subjects who have a positive test result (true positive rate). If it is 80%, then out of 10 truly diseased (anxious) people, eight will be correctly identified using the instrument. Specificity refers to the proportion of the non-diseased subjects who have a negative test result (true negative rate). So nine out of 10 people without anxiety will be correctly identified as 'normal' using the instrument. Choices D and E refer to positive and negative predictive values, respectively. Positive predictive value refers to the proportion of test-positive subjects who are actually diseased. For the given values of sensitivity and specificity this is 8/9. Negative predictive value refers to the proportion of test-negative subjects who are in fact 'normal'. For the given values of sensitivity and specificity this is 2/11.

Lawrie SM, McIntosh AM, and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 96.

62. B. A receiver-operator curve is used to decide the optimal cut-off of a screening test. A funnel plot is used in systematic reviews and meta-analyses to demonstrate publication bias. The likelihood ratio of a negative result in diagnostic evaluation is given by a likelihood nomogram. The survival rates of inception cohorts in a follow-up study are demonstrated using a Kaplan–Meier curve. Kappa statistics can be used to test inter-rater reliability of a new instrument.

Lawrie SM, McIntosh AM, and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 146.

63. B. Cohort studies can be differentiated from case–control studies on the basis of the time of exposure and duration of observation. In case–control studies the exposure has occurred in the past, unknown to the researcher. Cases and controls are independently recruited and differential exposure is ascertained in the two groups. In cohort studies, recruitment into a study takes place as soon as or as and when the exposure occurs (exposure cohort). In this question, exposure is the traumatic flight. Outcome is prospectively observed development of PTSD. Therefore this is a cohort study.

Lawrie SM, McIntosh AM, and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 30.

64.A. Inception cohort refers to all individuals assembled at a given point based on some factor, for example common demography or common life experience. In the above example, following a survey, a group of individuals with similar experience of auditory hallucinations are followed up prospectively. Hence they constitute an inception cohort. Open cohort refers to recruiting the cohort over an extended period of time instead of choosing the same point in time. In most open cohorts the individual subjects are followed up for variable time intervals until the study is completed.

Laupacis A, Wells G, Richardson WS, and Tugwell P. Users' guides to the medical literature. V. How to use an article about prognosis. *JAMA* 1994; **271**: 234–237.

65.D. Widely known as the Bradford Hill's criteria for causal association, demonstration of the following helps to ascertain cause–effect relationships:

1. Temporal association: The cause X must have occurred before the effect (disease) Y.
2. Dose–response relationship: the higher the X, the more the Y.
3. Consistency of association: whenever Y is present X is present and vice versa.
4. Strength of association must be high.
5. Biological plausibility: X has a biologically sensible causal pathway leading to Y.
6. Specificity: X is associated with Y only, not a wide range of other diseases.
7. There must be experimental evidence to support the claims.

Holt RIG and Peveler RC. Antipsychotic drugs and diabetes—an application of the Austin Bradford Hill criteria. *Diabetologia* 2006; **49**: 1467–1476.

66.E. Cross-sectional surveys are best suited for calculating epidemiological measures such as prevalence rates. To detect incidence rates the cross-sectional survey must be conducted at two different time points (to ascertain 'new' cases). To detect point prevalence rates a single cross-sectional study should be sufficient.

Lawrie SM, McIntosh AM, and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 23.

67.B. Studies show that exposure to maternal drinking in adolescence is a strong risk factor for the development of alcohol problems in early adulthood. For males and females, no association was found between either birth factors or childhood factors and a lifetime diagnosis of alcohol disorders at age 21 years. Externalizing symptoms and maternal factors at age 14 years were significantly associated with alcohol problems. For youths aged 14 years, maternal moderate alcohol consumption accounted for the highest percentage of attributable risk among those exposed.

Alati R, Najman JM, Kinner SA et al. Early predictors of adult drinking: a birth cohort study. *American Journal of Epidemiology* 2005; **162**: 1098–1107.

68.C. Accuracy refers to the extent to which results are close to the truth. In psychometry, it is used interchangeably (and controversially) with the term validity. Precision refers to the extent to which results are consistent or close to each other and hence are reproducible. The new test produces results that are close to the truth as observed from the gold standard results. Hence it is accurate, but the magnitude of measured outcome varies widely among the tested population. Hence it is not precise.

Streiner DL and Norman GR. "Precision" and "accuracy": two terms that are neither. *Journal of Clinical Epidemiology* 2006; **59**: 327–330.

69.C. Though OCD was previously thought to be quite rare, recent evidence suggests this is not the case. A lifetime prevalence rate of 2–3% has been suggested. OCD is among the top 20 causes of illness-related disability for people between the ages of 15 and 44. The age of onset of OCD is usually mid-to-late twenties. The female to male ratio is said to be more or less equal, though some studies suggest an excess in females. The mean age of onset for men is around 22 years, for women this is slightly delayed—around 26 years. The illness tends to be secret in most patients with a delay of several years before treatment is sought. OCD is the fourth most common mental illness in world. The disorder presents with comparable prevalence rates across various countries, with some cultural specificity to the content of obsessions.

Weissman MM, Bland RC, Canino GJ et al. The cross national epidemiology of obsessive compulsive disorder. The Cross National Collaborative Group. *Journal of Clinical Psychiatry* 1994; **55**: 5–10.

70.A. The prevalence of diabetes is higher in not only schizophrenia but also in patients with bipolar I disorder (26%) and schizoaffective disorder (50%), independent of psychotropic drug use. Genetic factors have a key role in the association between schizophrenia and diabetes; up to 50% of individuals with schizophrenia were found to have a family history of type 2 diabetes in a study. The increased risk is demonstrated regardless of antipsychotic medication use. Due to frequent screening and blood test in the treatment-resistant group, the detection of hidden impaired glucose tolerance may be higher. Diabetes is estimated to be at least two to four times more prevalent in schizophrenia than in the general population, but significant variability is noted in the actual prevalence rates reported. Difficulties in developing a wide-reaching screening programme may be a source of this variability.

Bushe C and Holt R. Prevalence of diabetes and impaired glucose tolerance in patients with schizophrenia. *British Journal of Psychiatry* 2004; **184**: 67–71.

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chapter
3

ADVANCED PSYCHOLOGY

QUESTIONS

- 1. While measuring attitudes to abortion, the subjects are given a set of statements carefully chosen by a panel of judges beforehand. Each statement carries a pre-assigned value. The subjects are asked to indicate whether they agree or not with each statement. Which of the following methods is being used in this study?**
 - A. Likert Scale
 - B. Osgood's Semantic Differential Scale
 - C. Thurstone Scale
 - D. Sociogram
 - E. Scalogram

- 2. A boring task is administered to two groups of people. One group is paid £20 and the other is paid £1 for undertaking the task. Which of the following results is possible after completion of the task?**
 - A. Only the £1 group will appreciate the usefulness of the task.
 - B. Only the £20 group will appreciate the usefulness of the task.
 - C. Both groups will equally appreciate the task.
 - D. Both groups will equally detest the task.
 - E. The outcome will depend on the length of the task.

- 3. Measured attitudes often differ from observed behaviours. Which of the following could improve the correlation between a measured attitude and actual behaviour?**
 - A. Repeated measurement of attitudes
 - B. Measuring attitude in a general context without hypothetical constraints
 - C. Measuring the single most predictive attitude for a given behaviour
 - D. Measuring attitudes with specified target, context, and time elements
 - E. Postal survey of attitudes

- 4. A politician is trying to persuade his working-class audience to vote in favour of his space science policy. Which of the following will produce a successful persuasion?**
- A. Being highly credible with respect to the policy
 - B. Appearing strikingly different from the audience
 - C. Providing an overview of both good and bad aspects of his policy
 - D. Inducing a high degree of fear regarding the consequences of non-acceptance
 - E. Introducing the topic by emphasizing that the policy has been made by a panel unknown to the politician
- 5. Which of the following statements is incorrect with respect to the role of fear in changing one's attitudes?**
- A. Absence of fear can inhibit attitude change
 - B. Extreme fear can inhibit attitude change
 - C. In the presence of precise instructions, fear facilitates attitude change
 - D. Feeling of vulnerability decreases attitude change
 - E. Fear and attitude change are related by an inverted U shaped curve
- 6. An autistic child is successively reinforced for behaviours ranging from making eye contact, attending to therapist's speech, and imitating speech sounds until sentences are uttered in normal social contexts. This technique is called**
- A. Shaping
 - B. Chaining
 - C. Flooding
 - D. Aversion therapy
 - E. Token economy
- 7. A smoker is made aware of numerous health problems that could occur due to smoking. If the smoker attempts to reduce the dissonance between his smoking behaviour and health beliefs, which of the following is least likely to happen?**
- A. Change in smoking behaviour
 - B. Removing the dissonant health belief
 - C. Minimizing the importance of one's health
 - D. Adding a new belief, for example 'filter cigarettes are safe'
 - E. Denying the strength of evidence for smoking-related harm
- 8. Inducing cognitive dissonance is an important therapeutic approach in which of the following treatments?**
- A. Systematic desensitization
 - B. Token therapy
 - C. Interpersonal therapy
 - D. Motivation enhancement therapy
 - E. Brief psychodynamic therapy

- 9. Which of the following terms describes an evaluative rather than a descriptive stand one holds about oneself?**
- A. Self-image
 - B. Bodily self
 - C. Self-esteem
 - D. Self-consciousness
 - E. Ideal self
- 10. Behavioural couples therapy is a treatment approach used in which of the following conditions?**
- A. Alcohol use disorder
 - B. Premature ejaculation
 - C. Sex offender therapy
 - D. Delusional jealousy
 - E. Dependent personality disorder
- 11. Which of the following factors plays a role in the development of self-concept?**
- A. Reaction of others towards oneself
 - B. Social comparison one makes with others
 - C. Social roles one plays in everyday life
 - D. Identification with a social group
 - E. All of the above
- 12. In a prosperous country with good tolerance, a famine strikes all of a sudden. This is followed by a surge of intolerance between two racial tribes wherein the minorities are discriminated against. Which of the following theories can explain this prejudice?**
- A. Relative deprivation theory
 - B. Group membership theory
 - C. Social identity theory
 - D. Authoritarian personality theory
 - E. Cognitive dissonance theory
- 13. The term ‘nomothetic’ in personality theories refers to which of the following concepts?**
- A. Personality is unique for each individual
 - B. Individuals have overlapping personality traits
 - C. Ambiguity can induce personality variables to come to the surface
 - D. Personality is influenced by pathological processes
 - E. Personality is not measurable but can only be described

14. Which of the following distinctions between prejudice and discrimination holds true?

- A. Prejudice is a behaviour while discrimination is an attitude
- B. Discrimination and prejudice are both attitudes
- C. Prejudice is an attitude while discrimination is a behaviour
- D. Discrimination has both cognitive and behavioural components
- E. Prejudice can only be negative while discrimination could be positive or negative

15. Which of the following is the average age by which the concept of theory of mind becomes established in children?

- A. 2 to 2 1/2 years
- B. 1 to 1 1/2 years
- C. 3 1/2 to 4 years
- D. 6 to 7 years
- E. 8 to 9 years

16. Which of the following is often the first social category learnt by a developing child?

- A. Concept of individualism
- B. Gender concept
- C. Race concept
- D. Religion concept
- E. Age concept

17. The average age by which most humans develop self-recognition is

- A. 1 to 3 months
- B. 16 to 18 months
- C. 18 to 20 months
- D. 12 to 14 months
- E. 4 to 6 months

18. ‘Touching the dot’ is a popular psychological experiment to demonstrate which of the following concepts?

- A. Self-esteem
- B. Gestalt theory of perception
- C. Self-recognition
- D. Visual perception
- E. Depth perception

19. After her failure in an examination in spite of hard work, a candidate starts regarding the failure as a stepping stone to success. Which of the following explains such an attitude?

- A. Effort justification dissonance
- B. Denial mechanism
- C. Passive-aggressive personality
- D. Narcissistic personality
- E. Learned helplessness

20. Which of the following methods of measuring attitudes uses bipolar adjectives?

- A. Likert scale
- B. Osgood's Semantic Differential scale
- C. Thurstone Scale
- D. Sociogram
- E. Scalogram

21. While undergoing couples therapy, each partner agrees a way of rewarding the other when the desired behaviour is carried out. This is called

- A. Sculpting
- B. Role reversal
- C. Socratic questioning
- D. Guided discovery
- E. Reciprocity negotiation

22. The id impulses are counterbalanced by defence mechanisms mediated by ego. When id retaliates against the moral imposed by superego, which of the following results?

- A. Repressions
- B. Obsessions
- C. Suppression
- D. Repetition compulsion
- E. Dissociation

23. A 45-year-old depressed man becomes clingy and tearful when his wife visits him. He adapts a fetal posture and sleeps on her lap. Which of the following is being exhibited?

- A. Repression
- B. Sadism
- C. Retardation
- D. Regression
- E. Degeneration

24. According to psychoanalytic theories of anxiety which of the following anxieties is the most primitive in development?

- A. Disintegration anxiety
- B. Superego anxiety
- C. Castration anxiety
- D. Separation anxiety
- E. Stranger anxiety

25. Which of the following applies to Jungian modification of psychoanalysis?

- A. Active imagination is encouraged
- B. Thanatos or death instinct forms the dominant concept
- C. Uninterrupted, lifelong psychotherapy is encouraged
- D. Jungian therapy is based on object relations theory
- E. Play therapy is encouraged

26. A psychiatric trainee is reprimanded for using social network websites with explicit sexual content while at work. He explains that such breaks are very important while doing a stressful job and preventing web access at work will only make him less efficient at work. Which of the following defence mechanisms is he using?

- A. Intellectualization
- B. Reaction formation
- C. Projection
- D. Rationalization
- E. Sublimation

27. The term cathexis in psychoanalysis refers to which of the following?

- A. The junction between two neurones
- B. Re-enactment of childhood conflicts during a therapy session
- C. Narrating negative experiences in life without inhibition
- D. The instinctual energy stored in neurones
- E. A defence mechanism thought to act during sleep

28. A patient attending psychotherapy sessions for pervasive anxiety and depression shows reduced interest in the therapy gradually, after the first eight sessions. When questioned she replies that she continues to attend only to achieve the satisfaction of 'being looked-after'. Which of the following processes explains the above?

- A. Counter transference
- B. Transference neurosis
- C. Transference regression
- D. Aggression turned outwards
- E. Narcissistic transference

29. Which of the following themes is central to Kleinian psychoanalysis?

- A. Relationship between past and present life
- B. Relationship between libidinal desires and routine events
- C. Relationship between internal and external world
- D. Relationship between collective and individual unconscious
- E. Relationship between ideal and real self

30. Which of the following is true according to the social identity theory?

- A. Individuals often choose between social identity and personal identity
- B. Each individual has a single specific social identity
- C. In-group attitudes help preserve social identity
- D. Social identity cannot influence self-esteem directly
- E. Discriminatory behaviour is not related to one's social identity

31. In a therapy group for patients with emotional instability, a 34-year-old lady realizes how her interactions differ significantly in the group compared to her past relationships. Which of the following processes is described in this scenario?

- A. Positive group identification
- B. Group cohesion
- C. Corrective emotional experience
- D. Mirroring
- E. Catharsis

32. Which of the following factors is not considered influential in achieving personal growth and change while undergoing a group therapy?

- A. Instillation of hope
- B. Imparting information
- C. Imitative behaviour
- D. Stable administration
- E. Socialization in the group

33. In therapeutic dramatization (psychodrama) the term protagonist refers to which of the following?

- A. The person most loved by the patient
- B. The therapist
- C. A fellow patient who aids in treatment
- D. The patient
- E. The person most hated by the patient

34. According to Freud's structural model of mind, which of the following is correctly arranged in order of development?

- A. Ego, id, superego
- B. Id, ego, superego
- C. Superego, ego, id
- D. Superego, id, ego
- E. Id, superego, ego

35. Which of the following psychosexual phases and developmental fears is correctly matched?

- A. Oral phase: fear of annihilation
- B. Anal phase: fear of loss of loved object
- C. Genital phase: castration anxiety
- D. Latent phase: feelings of guilt
- E. Oedipal phase: fear of annihilation

36. A therapist encourages her patient to continue avoiding the phobic object, in order to create an insight about the problems associated with such behaviour. Which of the following techniques is she using?

- A. Triangulation
- B. Negative transference
- C. Paradoxical injunction
- D. Reframing
- E. Covert sensitization

37. Which of the following groups has a high level of leadership activity with highly specific therapy goals?

- A. Psychodrama
- B. Interpersonal therapy
- C. Problem-solving therapy
- D. Problem-drinkers groups
- E. Systems-centred groups

38. Which of the following disorders and defence mechanisms is correctly paired?

- A. Anankastic personality: projective identification
- B. Schizoid personality: splitting
- C. Conversion disorder: suppression
- D. OCD: undoing
- E. Anorexia: anticipation

39. Which of the following is not a major principle of a therapeutic community?

- A. Communalism
- B. Democratization
- C. Permissiveness
- D. Instillation of hope
- E. Reality confrontation

40. Which of the following can reduce prejudice against a minority group?

- A. Negotiating under conditions imposed by the minorities
- B. Improving social contact between members of equal status
- C. Increasing personal friendships between opposite group members
- D. Careful prevention of self-experience of prejudice by the members of dominant group
- E. Setting up competitive targets between the two groups

41. Which of the following concepts refers to the ability of an analyst to deal with repeated primitive transferences which evolve during psychotherapy without retaliation or abandonment of the patient?

- A. Containing
- B. Holding
- C. Probing
- D. Withstanding
- E. Working through

42. Which of the following stages of change is most suitable to start acamproseate?

- A. Precontemplation
- B. Contemplation
- C. Maintenance
- D. Action
- E. Relapse

43. When asked to recall the attachment experience in childhood, a subject gives an unelaborated account, minimizing problems faced as a child. Which of the following attachment style has this subject most likely had as a child?

- A. Secure autonomous pattern
- B. Insecure avoidant pattern
- C. Insecure disorganized pattern
- D. Insecure ambivalent pattern
- E. Multiple attachment pattern

44. Deficits, disputes, and role transitions are identified in which of the following psychotherapies?

- A. Dialectic behavioural therapy
- B. Rational emotive therapy
- C. Interpersonal therapy
- D. Brief dynamic therapy
- E. Motivational enhancement therapy

45. Which of the following therapies uses the terms 'snags', 'dilemmas', and 'role repertoires'?

- A. Dialectic behavioural therapy
- B. Rational emotive therapy
- C. Interpersonal therapy
- D. Cognitive analytical therapy
- E. Motivational enhancement therapy

46. Which of the following treatments was specifically developed to reduce intentional self-harm behaviour?

- A. Dialectic behavioural therapy
- B. Rational emotive therapy
- C. Interpersonal therapy
- D. Cognitive analytical therapy
- E. Motivational enhancement therapy

47. Your pet dog barks at your new friend who visits you at home. When you hug your friend during every subsequent visit, the dog gradually stops barking. Which of the following best explains this phenomenon?

- A. Reciprocal determinism
- B. Reciprocal inhibition
- C. Applied relaxation
- D. Biofeedback
- E. Vicarious learning

48. A teacher notices that one of her pupils is sleeping during her lecture while the rest are actively listening. She concludes that her lecture is boring and worthless. Which of the following cognitive distortions best suits the above description?

- A. Arbitrary inference
- B. Catastrophic interpretation
- C. Overgeneralization
- D. Selective abstraction
- E. Dichotomous thinking

49. Production of repetitive phonemes seen in a growing child is called babbling. Which of the following is true with respect to babbling?

- A. Deaf-mute children do not babble.
- B. Babbling is seen around 6 weeks of age.
- C. The age of attaining the ability to babble depends on the mother tongue.
- D. Babbling takes place irrespective of the presence of adults in the vicinity.
- E. Babbling stops when the first word is learnt.

50. In Cattell's personality theory, the 16 measured personality factors (16PF) can be termed

- A. Surface traits
- B. Secondary traits
- C. Source traits
- D. Central traits
- E. Cardinal traits

51. While making a moral judgement on a narrated story, a girl expresses that there is no wrong in doing things which will get her candies. Which phase of moral development is she in?

- A. Universal ethical orientation
- B. Social contract orientation
- C. Conventional morality
- D. Obedience orientation
- E. Reward orientation

52. During psychotherapy, a patient starts becoming unwell after a prolonged period of good recovery, in spite of having many more sessions to come in the future. Which of the following can explain the above?

- A. Negative therapeutic reaction
- B. Termination reaction
- C. Negative transference reaction
- D. Uncovering repressed memories
- E. Resistance to change

53. Which of the following is not a cognitive variable crucial for social learning?

- A. Attention
- B. Imitative reproduction
- C. Memory retention
- D. Motivation
- E. Problem solving

54. Which of the following best describes supportive psychotherapy?

- A. It is a goal-directed psychotherapy
- B. Its primary aim is to help patients strengthen their ego defences
- C. It is generally a brief and time-limited therapy
- D. Its primary aim is to provide generic social skills training
- E. Explicit reassurance must not be given when sought by the patient

55. Which of the following cognitive distortions is characteristically seen in patients with panic attacks?

- A. Catastrophic thinking
- B. Minimization
- C. Dichotomous thinking
- D. Rationalization
- E. Overgeneralization

56. In Milgram's obedience experiments, which of the following decreased the tendency of the subject to administer shock to a victim?

- A. Prominent authority of experimenter
- B. Proximity of victim to the subject
- C. Proximity of the experimenter to the subject
- D. Administration of shock using a proxy or helper
- E. Removing responsibility from the subject

57. Discussing a controversial decision in a group strengthens average individual inclinations to vote against the risky decision. What is the name given to the above process?

- A. Obedience
- B. Conformity
- C. Groupthink
- D. Group polarization
- E. Risky shift

58. Which of the following statements with respect to language development is incorrect?

- A. The earliest learnt words are context bound
- B. 'Holophrases' are one-word substitutes for a whole sentence
- C. Vocabulary of word-production exceeds word-comprehension by 18 months of age
- D. Propositions are learnt later than verbs
- E. Telegraphic speech is seen after 18 months of age

59. In a behavioural therapy session for repetitive hair pulling, the patient is asked to wear gloves when he finds himself in a stressful situation that can promote hair pulling. This technique could be termed

- A. Self-monitoring
- B. Stimulus control
- C. Chaining
- D. Negative practice
- E. Exposure and response prevention

60. Repeated eye movement during a conscious recollection is used as a psychotherapeutic technique in which of the following disorders?

- A. Panic disorder
- B. Agoraphobia
- C. Compulsive skin picking
- D. PTSD
- E. Depression

61. Which of the following is true regarding the Parental Bonding Instrument?

- A. It is an observer-rated scale to be administered by trained child psychologists
- B. It is prone to recall bias
- C. It is used to elicit attachment style from breast feeding mothers
- D. It is used to interview school-aged children on the quality of bonding
- E. The questions are semistructured

62. The five-areas approach to CBT includes focusing on all of the following domains of a patient's experience except

- A. Behaviours
- B. Physical symptoms
- C. Relationships
- D. Thinking
- E. Traumatic past

63. While administering CBT, all of the following are appropriate therapeutic processes that can be employed by a therapist except

- A. Encouraging reduction in working hours to reduce stress
- B. Exploring the patient's illness model
- C. Setting goals and targets initially
- D. Setting tasks to be completed as homework
- E. Using the patient's own descriptive terms

64. Which of the following is true with respect to psychoanalytic theory of depression?

- A. Awareness of a painful thought is important for the origin of depression
- B. Anger can present as depression
- C. The concept of 'object' always refers to a parent
- D. The main source of depression is dream content
- E. Depression cannot be treated after early adulthood

65. Which one among the following processes seen in group therapy is not associated with Wilfred Bion?

- A. Basic assumptions
- B. Amplification
- C. Fight–flight
- D. Pairing
- E. Dependency

- 66. Richard is a student in sociology at the University. He favours behaviour such as reading, meditating, creative writing, and composing music, compared to his flat mate, Martin, who prefers to spend most of his time with his circle of friends. According to Jung's type trait theory of personality, Richard would best be described as an**
- A. Ambivert
 - B. Ectomorph
 - C. Endomorph
 - D. Extrovert
 - E. Introvert
- 67. Jim is an 80-year-old man who leads a retired life with his wife Sarah. He had been a postman till he retired at the age of 60. He raised two children who are successful engineers and have families of their own. Looking back at his life, he gets a sense of fulfilment and feels that he can face approaching death with a sense of acceptance. According to Erikson, what trait does he have?**
- A. Generativity
 - B. Identity
 - C. Integrity
 - D. Isolation
 - E. Self-actualization
- 68. Non-directiveness, unconditional positive regard, active listening, and empathy are features of a psychotherapeutic technique originated by Carl Rogers. Which of the following therapies do these terms represent?**
- A. Behaviour therapy
 - B. Client centred therapy
 - C. Family therapy
 - D. Psychoanalytic psychotherapy
 - E. Rational emotive therapy
- 69. The ABCD system of emotional self-control is a feature of which of the following therapies?**
- A. Client-centred therapy
 - B. Cognitive therapy
 - C. Family therapy
 - D. Psychoanalytic psychotherapy
 - E. Rational emotive behaviour therapy

70. Behavioural activation can be used as a method of treating depression.

In behavioural activation, one's day is structured with certain activities consistent with the intended positive outcome. Which of the following is the major component of activity scheduling?

- A. Keeping notes and diaries to prompt the patient
- B. Listing only pleasurable activities on the schedule
- C. Negative reinforcement of avoidance behaviour
- D. Postponing an activity until the development of full motivation
- E. Scheduling activities that have been avoided

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chapter
3

ADVANCED PSYCHOLOGY

ANSWERS

1.C. Various methods are used to measure the attitudes of a subject on a specific issue. The method described in Question 1 is an example of the Thurstone scale. When constructing a Thurstone scale, hundreds of statements are initially produced pertaining to a particular topic, for example abortion. These statements are presented to a sample of people (similar to a panel of judges) who are asked to score the statements on an 11-point scale. A set number of statements, for example 10 on each extreme (positive and negative attitude), are chosen based on the consistency of scores given by the judges. Each of these statements will carry a value that is the average of 100 judgements on the 11-point scale. These 20 statements are clubbed together to produce an attitude scale, which is administered to the subject. The subject will then indicate what statements he agrees with. It is not often used because the method is too tedious. The 11 points (used to rate each statement) are assumed to be intervals and averages are used to obtain the value scores. This is not entirely accurate as the 11-point scale is in fact ordinal. In the Likert scale, graded 'strongly agree' to 'strongly disagree' measures are employed. It is statistically reliable (ordinal data) and easy to construct. It is usually constructed as a five- to seven-point scale.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 192.

2.A. Contrary to popular belief, the group that is paid more will not appreciate the boring task. As they obtained a good incentive, they will not develop a dissonance. They may lie about its usefulness but in fact they will not change their belief about the boring nature of the task. In contrast, the lowly paid group will experience a cognitive dissonance between the two facts—'This task is boring' and 'I am doing this task without much incentive'. Hence they will change their initial attitude towards the task and, in fact, will start liking the task. This is called the one-dollar/20-dollar experiment and explains processes that substantiate counter-attitudinal behaviours.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 420.

3.D. In the field of attitude research, the relative lack of correlation between expressed attitude and actual behaviour is an important hurdle. Attitudes can be elicited with specific assessment of:

1. The target of one's attitude
2. The actual action expected when faced with the target
3. The specified context in which such action is expected
4. The time when this action is expected.

With such specific assessment, the correlation between measured attitude and behaviour improves considerably. Single instances of behaviours are not reliable indicators of attitudes. Repeated observations of behaviours (not measurement of attitudes, as stated in Choice A) may improve the validity. The notion that a specific behaviour is influenced by one predominant attitude is too simple and reductionist. Various attitudes interact to produce behaviour. There is no evidence to suggest that a postal survey of attitudes has better validity than other methods.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 410.

4.A. The success of persuasive communication depends on many variables. These variables can be grouped as those that depend on the source (communicator—the politician in this case), the message itself, the audience, and the medium of communication. A communicator who is perceived to be reliable, likeable, attractive, and an expert are positive features that will result in effective persuasion. When the audience perceive a degree of similarity with the communicator, the effectiveness of persuasion increases. Inducing moderate but not a high degree of fear can help effective persuasion. When a message is presented to a well-educated and highly informed audience who will hear both sides of a story before making a judgement, explaining both pros and cons (two-sided messages) is more useful than just highlighting the advantages of a policy (one-sided messages). Providing disclaimers, for example highlighting one's distance from the advocated message, is often counterproductive.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, pp. 225–226.

5.D. The relationship between fear and persuasion is an inverted U shape—too little or too much fear will reduce the effectiveness of persuasion. This is similar to the Yerkes–Dodson law which correlates arousal with performance of an activity. When one is too aroused, performance is inhibited. At the same time, when someone is not aroused at all, performance is again inhibited. Optimum arousal seems to be necessary for peak performances. This is clearly evident in performing sexual activity. When a subject is made to feel vulnerable, this increases one's concerns and, as a result, increases one's attention to a message. For example in order to persuade adolescents to practice safer sex, the high prevalence of HIV is highlighted before advising safe sexual practices.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 225.

6.A. Shaping refers to an operant conditioning technique that has been used in autistic children. It consists of successive reinforcement of behaviours that approximate to the final desired behaviour. It is different from chaining in that chaining involves eliciting a complex behaviour by reinforcing the comparatively simpler components of the behavioural chain. Flooding is a behavioural technique used in exposure therapy. In this technique, sudden exposure to highly threatening stimulus (from a hierarchical list of various anxiety provoking situations) is attempted. It is often unacceptable to many patients and is not popular. Aversion therapy is not used in present-day behavioural treatment. It refers to a conditioning technique where negative reinforcement is used to bring about a desired behaviour or to stop an unwanted behaviour. It is not very effective as any positive outcome tends to be temporary. Token economy is a contingency technique where immediately available secondary reinforcers (e.g. coupons, vouchers, tokens) are used to reward a desirable behaviour. Later, primary reinforcers can be obtained in exchange for secondary reinforcers. A wide variety of behaviours can be thus reinforced even in large group settings.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 822.

7.A. This is an example of cognitive dissonance or, more precisely, attitude behaviour discrepancy. Cognitive dissonance is defined as a psychological tension that arises when inconsistent cognitions are held simultaneously. A similar tension can also occur when there is a discrepancy between one's attitude and behaviour. When one is faced with such dissonance, a change in behaviour happens very rarely. Changing one's behaviour requires more motivation, effort, and sustained energy. Instead one of the following three happens more often:

1. Removal or denial of the dissonant cognition ('There is no evidence that smoking is harmful')
2. Trivializing the dissonant cognition ('I do not smoke that much' or 'Pleasure is more important than health')
3. Adding a new consonant cognition to counter balance the dissonance ('Smoking helps to reduce my tension' or 'Not everyone who smokes will die early').

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 222.

8.D. The concept of cognitive dissonance is therapeutically employed in motivation enhancement therapy. When treating harmful users of alcohol, the evidence for harm caused by alcohol is highlighted along with reflecting on one's continuous drinking behaviour. This induces a cognitive dissonance which will drive towards an action.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 224.

9.C. Self-esteem refers to an evaluative stand one holds about oneself. In self-psychology an array of terms are used, somewhat confusing the concepts.

Self-consciousness: awareness of distinct self compared to other objects in the environment. Only humans are thought to possess full self-consciousness.

Self-image: this refers to an answer one might give for the question 'who are you?' It includes one's description of social roles (social self), personality traits, and physical characters (bodily self). We do not feel odd swallowing our own saliva as it is a part of our self-image. Imagine being asked to swallow someone else's saliva!

Self-esteem: this refers to a personal judgement of worthiness expressed in the attitudes one holds towards oneself.

Ideal-self: this represents 'what we would like ourselves to be'. One's self-esteem depends on the discrepancy between one's ideal self and self-image.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 568.

10.A. Behavioural couples therapy is a specific intervention for alcoholism. It is derived from a general behavioural conceptualization of substance abuse, which assumes that family interactions reinforce alcohol-seeking behaviour. It has strong empirical and randomized controlled trial-based evidence for its effectiveness. It encourages family members to reward abstinence. Soon after the substance user seeks help, the patient and their partner are seen together in therapy for 15 to 20 out-patient couple sessions over 5 to 6 months. The therapist arranges a daily 'sobriety contract' in which the patient states his or her intent not to drink or use drugs that day (traditionally, one day at a time), and the spouse expresses support for the patient's efforts to stay abstinent. Stop-start or squeeze-pause techniques (Masters and Johnson) are used for premature ejaculation. Sex offender treatment programmes in the UK largely use Cognitive Behavioural Therapy (CBT)-based treatment approaches.

Fals-Stewart W and Birchler GR. A national survey of the use of couples therapy in substance abuse treatment. *Journal of Substance Abuse Treatment* 2001; **20**: 277–283.

11. E. All of the given factors in the question play equally important roles in developing one's self-concept. Parents react differently to their children according to their birth order. The eldest born is given more responsibility. This leads to a higher self-esteem in most first-born children. In a social environment, individuals make constant comparisons with other persons surrounding them in different domains. One's self-concept depends very much on the outcome of such comparisons. As one grows older, one takes up a variety of social roles. The role we play in society is crucial in the development of self-concept. Individuals often identify themselves as a part of a group for example 'I am a football fan'. This social identity plays an important role in self-development.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 573.

12.A. Various theories have been put forward to explain prejudice and discrimination. According to relative deprivation theory, when sudden discrepancies develop between the needs of a society and resources possessed by the society, acute relative deprivation results. This in turn leads to aggressive and discriminatory behaviour against a specific target, even though the targeted group was in no way responsible for the deprivation. Group membership theory states that mere perception of the existence of another group is sufficient to trigger discriminatory behaviour. Prejudice is common in individuals who suffer excessive disciplinary upbringing and later develop authoritarian personality. However, this authoritarian personality theory fails to explain sudden surges in social prejudice. According to social identity theory an individual strives to achieve a positive self-esteem by improving his social identity. Positive preference to one's own group (in group) can improve this image. Prejudice and discrimination can develop from this biased attitude. Cognitive dissonance theory is not a theory of prejudice.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 427–429.

13. B. Personality theories can be broadly divided into nomothetic theories and idiographic theories. Nomothetic theories take the view that there are common underlying traits in people's personality; we only differ in the degree (and intensity) to which we have these various traits. Cattell and Eysenck are important proponents of this approach. Idiographic theories take the view that every individual is unique and we cannot place people into boxes of similar shape and size. Psychoanalytic theories of personality and humanistic theories are examples of idiographic approach. According to idiographic theories, personality is better described than measured. Personality is thought to be pathoplastic, as it modifies psychiatric disease expression and itself becomes modified by the influence of a disease process. Ambiguous stimuli elicit responses that are coloured by one's personality and style of thinking. Projective tests, such as Rorschach's ink blot test, utilize this property.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 64.

14. C. Prejudice is best viewed as an attitude whose components include a cognitive part (stereotypes), affective part (hostility and hatred), and behavioural part. The behaviour related to prejudice can vary from mild to a severe extreme. Allport described (i) antilocution, (ii) avoidance of contact, (iii) discrimination, (iv) physical attack, and (v) extermination, as the behaviours associated with prejudice. One can have positive, neutral, or negative prejudice too. Of note is the term racism, which refers to an economical and political ideology while racial prejudice refers to individual attitudes.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 424.

15. C. Theory of mind develops around the age of 3 1/2 to 4 years old in most humans. Initially this is confined to the rudimentary concept of private thinking—understanding that one's thoughts are not visible to others. This is followed by understanding the existence of similar mental processes in other individuals—termed theory of mind. False belief task or Sally Anne task is used to test the theory of mind.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 576.

16. E. Age is often the first social category learnt by a child. It is thought to be developed even before a child develops full language abilities. Even the concept of numbers comes later. Exemplifying this, it is noted that age-related mistakes, such as calling an adult a baby, almost never occur in children. Gender identity develops around 3 years of age.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 576.

17. C. Self-recognition could be demonstrated in a growing infant by using a mirror. When a red dot is unknowingly placed on the face of a child, the child starts touching its face to explore the dot when a mirror is shown. This 'touching the dot' phenomenon does not occur less than 15 months of age; 5 to 25% of infants touch the dot by 18 months, while nearly 75% touch the dot by age 20 months. It is thus concluded that self-recognition rapidly develops between 18 and 20 months. Object permanence is thought to be a prerequisite to develop self-recognition so it is not possible before 9 months of age.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 579.

18. C. Gallup conducted the famous 'touching the dot' experiments to demonstrate self-recognition. It is noted that only higher primates and humans older than 20 months successfully demonstrate 'touching the dot'. Mirror recognition by primates may be a reflection of behavioural recognition, that is 'the one in the mirror is the same as me' rather than self-recognition, that is 'the one in the mirror is me'.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 576–577.

19.A. When we spend much effort in attaining a goal but do not attain the goal eventually, we are faced with a dissonance. The two facts 'I worked really hard' and 'I failed my exam' cannot coexist logically. Hence one starts perceiving that the result is not so bad and some may even consider that the result was indeed good for one's spiritual progress! This 'suffering-leads-to-liking' effect is also called effort justification dissonance. There is no narcissism or passive aggression in such behaviour. This is not a denial as the subject still accepts the failure but interprets it differently.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 224.

20. B. Osgood's Semantic Differential Scale is used to measure verbally expressed attitudes. It allows different attitudes about a particular topic to be measured on the same scale. It includes various factors constituting an attitude; for example while expressing one's attitudes regarding a politician one can rate him using an evaluative component (good ↔ bad), activity component (active ↔ inactive), and potency component (powerful ↔ weak), etc. Between the extremes of these bipolar adjectives a seven-point scale is placed and the subject is asked to indicate a score for each factor. Osgood's semantic differential assumes that every concept can be represented in a hypothetical semantic space with two extremes. Sociometry is a method of measuring interpersonal attitudes and it involves constructing a sociogram—for example a representation of 'who likes whom' in a family. Guttman's scalogram consists of various statements arranged in a hierarchy. Choosing a statement invariably implies that all statements that come below the chosen statement are accepted. Scalogram is also utilized in measurement of attitudes.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 192.

21. E. Reciprocity negotiation, role reversal, and sculpting are terms associated with couples therapy. In reciprocity negotiation, mutual rewarding of desirable behaviours through expression of affection or approval is carried out. This is often a primary component in couples therapy. In role reversal, mutual exchange of viewpoints takes place in a role-play setting. This helps in understanding each other's differing points of view of an issue. This technique is also used in psychodrama and group therapy. Sculpting refers to silent enactment of positions that express an aspect of relationship without verbal exchanges. Socratic questioning and guided discovery are terms associated with cognitive therapy.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 432, Key Study 25.1.

22. D. In simple terms, repetition compulsion refers to a person's tendency to repeat past traumatic behaviours. In psychoanalysis, ego defences are considered to rein over id impulses. When this defence is superseded, conflict arises leading to anxiety and various defences invoked in response. The ego mediates between timely release of id impulses and morals imposed by the superego. At times, the direct control of superego is thwarted and id impulses repetitively present, that is repetition compulsion which is a form of acting out.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 195.

23. D. Regression refers to moving back on one's developmental behaviours at times of crisis, as exemplified in the question. Repression is the shifting of conscious conflicts to the unconscious, leading to reduced anxiety. Sadism is purposeful inflicting of pain on oneself.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 197.

24.A. Disintegration anxiety precedes other types of anxiety discussed in the question. According to Klein, soon after birth and thereafter the child experiences an intense fear of fragmentation, called disintegration anxiety by later theorists. This is sequentially followed by persecutory fear (against the mother) and, later, separation anxiety. Castration anxiety is seen in the oedipal stage. Superego anxiety is the anxiety arising out of choices one has to make between instinctual drives and social morals. This is a mature type of anxiety that develops late in a child.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 370.

25.A. Jung was widely expected to succeed Freud as the leader of psychoanalysis, but Jung distanced himself from Freud on the account of Freud's ideas on infantile sexuality. Jung founded analytical psychology and expanded on 'unconscious' to include 'collective unconscious'. Jungian psychotherapy is a classical psychoanalytic therapy in the broad sense but Jung introduced active imagination or fantasy as a mode of therapy. He emphasized having holidays from analysis to reflect and think. He encouraged art therapy too. He stressed the concept of individuation. Thanatos is not a predominant Jungian concept and it is not an objects relation therapy.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 346.

26. D. This example refers to rationalization. A rationalizing individual offers rational explanations in an attempt to justify unacceptable attitudes or beliefs or actions. Intellectualization is closely allied to rationalization, but it is very important to note that in rationalization, the motives are usually primal and instinctually determined, for example sex, aggression, greed, etc. Intellectualization is an immature defence. It refers to excessively using intellectual processes to avoid experiencing painful emotions (not necessarily libidinal). An intellectualizing individual places undue emphasis on inanimate objects or parts to avoid dealing with emotion-provoking, 'living' elements. He may have more focus on outside reality to avoid inner feelings; in the process he may pay more attention to irrelevant details.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 205.

27. D. Cathexis refers to the supposed libidinal energy stored in neurones and kept under control by the monitoring action of ego. Release of cathexis presents as impulses and defence mechanisms serve to alter the expression. Libidinal energy may be constructive sexual energy or destructive aggression. The junction between two neurones is called a synapse. Re-enactment of childhood conflicts during a therapy session refers to transference. Dream work includes various processes and revisions and not defence mechanisms as such.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 193.

28. B. Transference neurosis involves the re-creation of the patient's conflicts enacted within the psychoanalysis session. This enactment mirrors aspects of the infantile neurosis. The transference neurosis usually develops in the middle phase of analysis, when the patient, after initial engagement, stops displaying consistent motivation but engages in therapy to attain emotional satisfaction of re-enacting her infantile conflict. Emergence of the transference neurosis is usually a slow and gradual process but when a patient has a propensity for transference regression (e.g. emotionally unstable or histrionic) this can occur quite early in the therapy.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 206.

29. C. Self-object relationship is the central theme in object relations theory propounded by Melanie Klein. The relationship between the internal and external world as represented by objects is studied in detail by object relation therapists. The relationship between past and present is emphasized more in a Freudian style of psychoanalysis.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 349.

30. C. Preference towards one's own group with positive in-group attributional bias helps in preserving one's social identity. According to social identity theory (SIT), an individual strives to achieve a positive self-esteem through personal and also social identity. So both exist concurrently. One can have several social identities according to the community in which one lives. Social identity has direct influence on one's self-esteem. By improving one's social identity, one can improve self-esteem. Unfortunately, while developing a strong social identity, in addition to pro in-group bias, one develops anti out-group bias that results in discrimination.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 433.

31. C. Corrective emotional experience was seen by Alexander as the central part of change secondary to psychotherapy. Processes that take place in a therapy setting give the patient an opportunity to reflect on their past experiences and make necessary behavioural or cognitive and emotional changes to reduce one's difficulties. Positive identification refers to an unconscious group mechanism in which a person incorporates the characteristics and the qualities of the group. Catharsis refers to the process by which mere expression of ideas and conflicts is accompanied by an emotional response which produces a sense of relief. Group cohesion refers to the sense that the group is working together towards a common goal.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 937.

32. D. Yalom cited 11 'curative' factors responsible for change in groups. Stability of administration is not one of them. The curative factors include instillation of hope, universality, imparting information (feedback), altruism, corrective recapitulation, socialization techniques, imitative behaviour, interpersonal learning, group cohesiveness, catharsis, and existential factors. Of these, cohesiveness and learning from feedback are valued positively, though other factors may also be important.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, pp. 1452 and 1448.

33. D. The term protagonist in therapeutic dramatization (psychodrama) refers to the patient. Auxiliary ego refers to an accomplice who acts as a significant person in patient's life. The director is the therapist who conducts the role playing.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 939.

34. B. According to Freud, id is the most primitive structure to develop. A baby is more or less born with the pleasure principle id. Soon after birth the child develops a concept of internal self versus external world, coinciding with the development of ego. Superego is largely a by-product of introjected parental values and social discipline. This develops only when a child is able to identify with its same-sex parent. This takes place following successful resolution of the oedipal complex. Interestingly, Freud considered the superego of girls to be weaker than boys as oedipal complex develops in a different trajectory for girls. A girl believes she has been castrated by her mother during development. She develops 'penis envy' and loves her father but, realizing she cannot have a penis, she replaces the envy with a wish for a baby. This leads to identification with her mother—but as prominent conflict-related anxiety is not involved, superego that develops at resolution of the Electra complex is weaker compared to boys.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 329.

35. D. According to psychodynamic theory, different phases of development are associated with different levels of anxiety. As soon as a child is born, he/she experiences what Klein described as disintegration anxiety, followed by persecutory (destructive) anxiety against the mother with resultant separation anxiety (related to depressive position). Here the fear is one of losing the loved object, that is the mother. In the oedipal phase, the most daunting fear is castration anxiety. When maturing out of the oedipal stage and entering the latent or genital stage, the child learns the experience of guilt secondary to development of superego. Hence development of superego needs resolution of oedipal conflict.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 370, Table 3.

36. C. The technique of paradoxical injunction developed from work of Gregory Bateson. Here, a therapist suggests that the patient intentionally engages in the unwanted behaviour; as described in the question. Though this seems to be counterintuitive, the therapy can create new insights for some patients. It is sometimes used in family therapy. Triangulation is one of the processes concerning family dynamics wherein the child is roped into conflicts between the mother and father and a triad is sustained. Reframing is also called positive connotation. It refers to redefining and relabelling all negatively expressed feelings and behaviours as positive. It is used in family therapy. Covert sensitization refers to a behavioural method of reducing the frequency of unwanted behaviour by associating it with the imagination (covert) of unpleasant consequences. Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, pp. 142 and 943.

37. D. Group therapies can be classified according to the objectives of the group and how the group is led or managed (leadership). Highly specific, target-oriented groups include structured groups for drug use or alcohol use, activity groups such as occupational therapy groups, etc. These groups have a high level of leader input. Psychodrama, music therapy, and systems-centred groups are some less-specific therapies but are highly directed by the leader or therapist. Problem-solving therapy and psychoeducational groups are highly specific but have a low level of therapist activity. Support groups, art therapy, interpersonal therapy, and groups such as Tavistock-model analytic groups have a low level of leader activity and have low specificity with respect to treatment goals.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1442.

38. D. Various defence mechanisms are used by patients and so-called normal populations at different times. People can have a style or pattern of predominant defence mechanisms. Traditionally, the psychodynamic school has proposed certain defences to be associated with certain diseases: obsessive compulsive disorder (OCD) with isolation of affect, undoing, and reaction formation; anorexia with denial, displacement, and rationalization; hysteria with conversion and repression; somatoform disorders with somatization; fugue with dissociation; schizoid personality with fantasy; borderline personality with splitting, projective identification, and introjection.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, pp. 335–336.

39. D. The four major principles on which a therapeutic community is based are exemplified by the Henderson hospital model. According to this model, the major components (with a mnemonic CPD-R) are:

1. Communalism—staff are not separated from inmates by uniforms or behaviours; mutual helping and learning occurs
2. Permissiveness—tolerating each other and realizing unpredictable behaviour can happen within the community
3. Democratization—shared decision making and joint running of the unit
4. Reality confrontation—self-deception or distortions from reality are dealt with honestly and openly by all members without formalities.

Instillation of hope is necessary for any supportive psychotherapy but has not been described as one of the four major principles behind therapeutic communities.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 608, Box 22.8.

40. B. Social psychologists have put forward various explanations to answer the question ‘how to reduce prejudice?’ Allport developed the ‘contact hypothesis’ to explain that when people of equal social status stay in close contact and pursue a common goal, the differences between them can disappear. It is well established that ‘autistic hostility’ between members of two groups exists due to lack of sufficient knowledge about the members of the opposite group. This ignorance leads to reinforcement of negative stereotypes, for example ‘We are hard working; they are lazy’. This is also known as a ‘mirror-image phenomenon’. The assumption that everyone in the opposite group is the same, called ‘illusion of out-group homogeneity’, also reduces with improved social contact, but it is important to note that this does not relate to a necessary increase in personal friendships between opposite group members. Imposing strongly one-sided conditions for negotiations will reduce perceived equality status, leading to maintenance of prejudice. Self-experience of prejudice by the members of one group can reduce the prejudiced behaviour exhibited by these members towards others. This was demonstrated by Elliott in the blue eyes/brown eyes experiment. When groups are set common goals to pursue, cooperation instead of competition ensues. This aids in reducing prejudice.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 438.

41. B. The description in Question 41 refers to ‘holding’. Holding was proposed by Winnicott. While administering psychotherapy, the affective and cognitive dispositions of a therapist play an important part. The cognitive capacity of the therapist to maintain objectivity and focus on selected facts during a discourse is called ‘containing’ (proposed by Bion). The affective disposition of the therapist, which helps in restraining oneself from retaliating to negative transferences, is called ‘holding’. Working through refers to the process by which the therapist repeatedly elaborates the identified conflict throughout the therapy in order to enable the patient to recognize and deal with it effectively.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 351.

42. D. Patients must be abstinent at the time of initiation of acamprosate. In precontemplation phase the patient will simply refuse an intervention. While contemplating treatment the patient will be still drinking actively. When he acts to stop drinking he will need withdrawal support. This is the best time to start acamprosate so that he can have reduced craving, which will aid him to stay in maintenance mode and reduce the likelihood of relapses. An occasional single relapse need not result in discontinuation of acamprosate. Starting when the patient had already relapsed will not be an ideal strategy.

Mason BJ. Treatment of alcohol-dependent outpatients with acamprosate: a clinical review. *Journal of Clinical Psychiatry* 2001; **62** (Suppl. 20): 42–48.

43. B. This question tests one’s knowledge about Main’s Adult Attachment Interview. This is a 15-item, semistructured, psychodynamic interview of adults exploring one’s experience as a child. The attachment style one had as a child correlates with the type of responses given when answering this interview. Those who had secure attachment provide spontaneous and coherent answers with an ability to talk freely about negative experiences in childhood. Those who had an avoidant (insecure) pattern often minimize their experiences, do not elaborate on them, and do not use colourful metaphors during the discourse. Those who had insecure but ambivalent (enmeshed) attachment use multiple emotionally laden responses and ramble excessively. Broken continuity and interrupted logical flow of thoughts is seen in those who had insecure, disorganized attachment pattern. Multiple attachments are common and their presence can be detected without the need for a discourse analysis.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 352.

44. C. Interpersonal psychotherapy (IPT) was proposed by Klerman and Weissman. The theory behind IPT is the observation that the development and maintenance of depression occur in a social and interpersonal context. The outcomes of most psychiatric illnesses are influenced by the interpersonal relationships between the patient and significant others. The therapy takes place in three phases: identification of problems, targeted action, and consolidating gains. Major interpersonal problems can be classified as grief, role deficits, role disputes, and role transitions. Grief refers to loss of a relationship. Role dispute arises due to conflicts between the related individuals. Role transition refers to life changes, for example change in job, etc. Deficit refers to social impoverishment and inadequate relationships.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 966.

45. D. These terms are used in cognitive analytical therapy (CAT), founded by Ryle. CAT views behaviour in terms of a procedural sequence model. When a goal-directed activity is carried out, a sequence of mental components is involved. An important function is making and testing hypotheses for successful social interactions. Some times, in what are termed neurotic repetitions, these sequences fail and effective hypothesis testing does not take place. These are:

1. Traps: where negative assumptions lead to blunting of the hypothetical approach
2. Dilemmas: false dichotomies are identified in decision making wherein the tested hypothesis can have either of just two outcomes
3. Snags (or subtle negative aspect of goals): in spite of having a good hypothesis this does not get tested as it is perceived to be forbidden or dangerous.

Denman C. Cognitive-analytic therapy. *Advances in Psychiatric Treatment* 2001; **7**: 243–256.

46. A. Dialectical behaviour therapy (DBT) was specifically designed by Linehan to address repeated self-harm behaviour, especially in patients with emotional instability. The core components of DBT are:

1. Affect regulation
2. Distress tolerance
3. Social skills training
4. Enhancing interpersonal effectiveness.

Ellis developed rational emotive therapy, which is predominantly cognitive-theory based.

Linehan M. *Skills Training Manual for Treating Borderline Personality Disorder*. Guilford Press, 1993.

47. B. This is called reciprocal inhibition. Wolpe introduced this term to explain how contradictory and incompatible responses cannot be conditioned to coexist simultaneously; as a result one response will be suppressed. In this example, suppression of stranger anxiety response (barking) follows the evocation of faithfulness and friendliness in the presence of the dog's primary food-giver. The physiologically antagonistic response of friendliness serves to extinguish barking through reciprocal inhibition. Reciprocal determinism and vicarious learning refer to social learning or modelling theory. There was no applied relaxation or biofeedback provided to the dog in question.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 9.

48. D. This question tests one's knowledge of Beck's cognitive distortions. Cognitive distortions are dysfunctional patterns of thinking that serve to produce and maintain depression or anxiety. A useful mnemonic to remember cognitive distortions is MOSPAD—minimization or magnification, overgeneralization, selective abstraction, personalization, arbitrary inference, and dichotomous thinking. In this scenario, the teacher can see one sleepy student amidst many active participants, yet the teacher chooses to select the negative aspect of the truth—selective abstraction. In arbitrary inference one comes to conclusion without seeing both sides of a coin. In minimization, one downplays one's successful achievements. Magnification refers to overrating one's negative aspects. In dichotomous thinking, a subject splits events around him to 'black or white', that is either good or bad with no grey area in between. Catastrophic interpretation is seen in panic attacks where minor events are misinterpreted in catastrophic proportions.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 149.

49. D. Babbling refers to the repetitive production of consonants around the age of 6 months. It is seen at the same developmental age irrespective of one's culture and mother tongue. It is largely an innate developmental milestone. Even deaf and mute children babble, but around 9 to 12 months this reduces and stops. Normally, babbling continues well into 18 months of age and does not stop with the production of the first words. Babbling is practiced alone by a child even in the absence of any adults; this means that communication is not the only intention in babbling.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 322, Box 19.1.

50. C. Source traits refer to those traits that act as basic building blocks of personality, as measured by Cattell's 16PF. Surface traits are easily observable traits that are correlated strongly with one another but are not important for making one's personality. Allport derived various trait labels from around 18 000 adjectives used in English. According to him, there are three main variants of traits—cardinal traits are the influential, core traits while central traits refer to the five to 10 less general traits an individual possesses. Least important of all are secondary traits, which are least general and consistent and are only noticed by close friends.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 741.

51. E. Kohlberg's stages of moral development include three major levels (which are not necessarily progressive phases during development), each containing two parts. In the stage of preconventional morality the child is initially punishment avoidant, that is anything that avoids punishment is a right thing to do. Later, reward orientation develops—anything that results in 'candies', as in this question, is morally right. In conventional morality, the child believes that the majority is always right and what pleases others must be morally right. Later, the child learns that doing one's duty and maintaining order defines moral values. The third level is one of postconventional morality. Here, one thinks that an individual's life comes above all man-made laws and, if necessary, laws should be changed by mutual agreement in a democratic country. Some people develop a higher, stage 6 morality, called universal ethical orientation. Here, universal moral principles are upheld more than an individual's sense of personal right or wrong.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 610, Box 35.5.

52.A. Freud observed that some patients became unwell when they started recovering from their difficulties during psychotherapy. He attributed this phenomenon to the guilt surrounding the change. This is usually noted in the middle phase of treatment. This must be differentiated from negative transference where aggressive or paranoid projective transference takes place, sometimes hindering the therapy progression. Termination reaction refers to the resistance offered by some patients while terminating therapy. The above example cannot be resistance to change as initial improvement could not have occurred as described if there was resistance to change.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p.1439.

53. E. Albert Bandura proposed the social learning theory based on modelling (vicarious learning). Cognitive variables are crucial in mediating social learning. These variables are:

1. Attention
2. Visual image or semantic code recorded in memory
3. Memory permanence using rehearsal and organization (retention)
4. Copying or imitation of behaviour
5. Motivation to perform the learnt act.

It is important to note that social learning differentiated learning from performance.

Reinforcement is generally not needed for learning but for performance. Problem solving is not a cognitive variable mediating vicarious learning.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 617, Box 35.7.

54. B. Supportive psychotherapy refers to a common component in many therapeutic operations. It refers to a supportive, explicitly reassuring approach to allay anxiety and help patients in crises. Positive instillation of hope, strengthening existing ego defence mechanisms, and environmental manipulation for supporting one's coping strategies are important components of supportive psychotherapy. It is generally provided unlimited in a predictable 'as and when necessary' manner. It is not specifically goal-oriented and hence social skills training cannot be considered as supportive psychotherapy.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 929.

55.A. Catastrophic thinking is a common cognitive distortion seen in patients with panic attacks. Minor physiological aberrations, such as missed heart beats or palpitations are common events. A catastrophic thinker interprets these minor aberrations in catastrophic proportion, making him think he is going to have a heart attack or he is going to die. When a similar experience occurs with faintness or dizziness, this is interpreted as 'going crazy'. Secondary to such catastrophic thinking, autonomic arousal and resultant panic sets in.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, p. 149.

56. B. Milgram conducted controversial experiments to explore why many conscientious individuals in Nazi Germany obeyed Hitler. In his paradigm, subjects were asked to administer a (sham) electric shock to a victim under some false pretence by pressing a dial. The victim can cry in agony to the awe and shock of many subjects. It was noted that most subjects would obey an authoritative experimenter and administer shocks, especially if they are not in close proximity to the victim or if the authority is keeping a close watch on the subjects. Peer rebellion against the orders of experimenter reduced obedience while proxy administration increased obedience. When the subjects were given more responsibility regarding the pain inflicted on the victim, the obedience (administering shocks) decreased.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 458, Box 27.1.

57. D. Group polarization refers to the phenomenon described in Question 57. There are various processes that influence individuals when making decisions as a part of a group. The group can make more risky decisions than those that an individual him/herself can. This is called risky shift. A group discussion process can strengthen average individual inclinations and polarize the group in the direction where most individuals were heading already. This is called group polarization. While making extreme decisions, the desire to agree with other members of a group can override rational judgment applicable in individual decision making. This is called groupthink. Conformity is a process whereby no explicit requirement is made to do a certain task, but peer influence and need for acceptance pushes one to carry out the task. Obedience refers to conditions where the individual is explicitly asked to do a task and this instruction comes from an authority.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 453.

58. C. At 18 months of age, the number of words understood by the child will usually exceed the number of words that the child can produce. Initially, a child uses words in a contextual fashion, for example the word duck is used only when a toy duck is pushed face down on the floor. Later the words get decontextualized and used more generously. At one point during development, the child uses 'holophrases' which are single words substituting the function of a full sentence. Verbal use of language is learnt earlier than propositions such as 'to', 'as', etc. Telegraphic speech consists of using two or more connected words without functional elements such as conjunctions or propositions for example 'Papa go bye'. This occurs around 18 months of age.

Gross R. *Psychology: The Science of Mind and Behaviour*, 5th edn. Hodder Arnold, 2005, p. 324.

59. B. The technique described here is called stimulus control. This is often utilized in relapse prevention for drug users and also in compulsive behaviours such as hair pulling or skin picking. It is not usually employed as a stand-alone therapy but is provided in combination with other behavioural and cognitive techniques to control compulsive symptoms. Self-monitoring refers to keeping a logbook or diary of problem behaviour in order to reflect and work through the problem. Chaining is a behavioural technique where successive reinforcement of simple behaviours leads to learning of a complex behaviour. Negative practice is a behavioural technique used in tics and Tourette's syndrome. Exposure and response prevention is used to reduce compulsions in OCD where exposure to an anxiety-provoking situation is deliberately coupled with not responding in a problematic fashion, that is compulsive behaviours.

Van Minnen A. et al. Treatment of trichotillomania with behavioral therapy or fluoxetine: A randomized, waiting-list controlled study. *Archives of General Psychiatry* 2003; **60**: 517–522.

60. D. The treatment described here is EMDR—eye movement desensitization and reprocessing. This technique was serendipitously discovered by Shapiro. When repeated eye movements in a relaxed state are induced by the therapist, conscious recollection of traumatic material can be successfully combined with positive thoughts. This has been advocated and practised for post-traumatic stress disorder (PTSD). The three components are:

1. Imagined exposure
2. Cognitive reappraisal replacing negative thoughts with positive ones
3. Saccadic eye movements induced by the therapist.

The role of the latter is not clearly established and it does not compare well against simple exposure therapy.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 593.

61. B. The Parental Bonding Instrument (PBI) is a self-report measure to be completed by those who are at least 16 years of age. The subjects are asked to score their parents on 25 attitudinal and behavioural items (each with a four-point Likert scale), as remembered during the first 16 years of the respondent's development. Hence it is prone to a high degree of recall bias. Potential sources of error include 'amnesia' of early childhood memories, pressure to appear 'conventional', or 'social', bias due to personality factors, trait characteristics, mood, and other psychopathology. The construct validity is also questionable.

Wilhelm K, Niven H, Parker G et al. The stability of the Parental Bonding Instrument over a 20-year period. *Psychological Medicine* 2005; **35**: 387–393.

62. E. The five-areas approach for assessment in CBT was proposed by Williams; it is a jargon-free and easily accessible model of CBT for use in busy clinical settings. It allows the patient and therapist to understand the patient's symptoms in a deeper manner by exploring:

1. Situation, relationships, resources, and practical problems
2. Symptoms such as physical feelings
3. Behaviours and activity level
4. Thinking
5. Feelings, mood, and emotions.

Wright B, Williams C, and Garland A. Using the Five Areas cognitive-behavioural therapy model with psychiatric patients. *Advances in Psychiatric Treatment* 2002; **8**: 307–315.

63. A. Active discouragement of work may be counter-therapeutic in most conditions. CBT does not adopt such prescriptive approach to problem solving. Exploring the patient's beliefs about his/her illness is an important part of assessment during CBT. Similarly, clear goal-setting can be therapeutic and has a role in motivating the patient. Homework tasks may include putting into practice what the patient learns during treatment sessions. Using the patient's own language can be helpful in enhancing therapeutic alliance and avoid misinterpretations during the therapeutic process.

Wright B, Williams C, and Garland A. Using the Five Areas cognitive-behavioural therapy model with psychiatric patients. *Advances in Psychiatric Treatment* 2002; **8**: 307–315.

64. B. Classic psychoanalytic theory of depression compares depression with mourning. High dependence and ambivalence in relationships may predispose to depression after object loss. The object referred to in psychotherapy need not necessarily be one's parent; it can be any other person or even an inanimate but personally important object. Identification is an unconscious mechanism wherein the self tries to become the same as the lost object in some respect. In depression, identification occurs on the basis of sympathy, guilt, or longing to keep a relationship with the lost object. In addition, it is thought that an excessively harsh or envious superego can influence severity, chronicity, and refractoriness of depression. Such superego turns aggression and anxiety against the self.

Taylor D. Psychoanalytic and psychodynamic therapies for depression: the evidence base. *Advances in Psychiatric Treatment* 2008; **14**: 401–413.

65. B. The ‘basic assumptions’ put forward by Bion are processes that need to be tackled effectively for group work to proceed. Bion postulated that when people meet in a group ‘basic assumptions’ become prominent. The basic assumptions include dependency (being passive and expecting the group leader to provide answers), pairing (coupling of idealized group members could lead to the birth of some creative answer to their problems), and fight–flight (the group’s response to perceived threats to its existence from outside) reactions. Various techniques employed in group therapy include ‘mirroring’ (non-judgmental reflection of one’s experience), ‘amplification’ (increase in emotional resonance by sharing), and ‘catharsis’ (supported ventilation of emotions). Within a group, processes such as scape-goating (e.g. blaming one member for lack of progress) or idealization of the therapist could occur. Similarly, unhealthy denigration could happen among team members. These are thought to be counter-therapeutic to the progress of the treatment.

Sadock BJ and Sadock VA. *Kaplan and Sadock’s Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 215.

66.A. Jung introduced the terms extraversion and introversion. He believed that people had different attitudes towards life in general. According to Jung, an extravert is primarily interested in the world of external objects, as depicted by Martin, who wants to be in the company of his friends. An introvert is mostly interested in what goes on within his own mind. Jung thought that both attitudes were necessary for a full comprehension of reality. Indeed, a number of people are what Jung referred to as ambiverts, but people are usually one-sided and tended to one or other extreme. The other concepts introduced by Jung include the concept of the collective unconscious, archetypes, animus, anima, and the shadow. Constitutional psychology is a theory, developed in the 1940s, by American psychologist William Herbert Sheldon. He associated body types with temperament. He divided people into three types: ectomorphs (ectoderm–skinny), mesomorphs (mesoderm–muscle), and endomorphs (gut–fatty). As such, Sheldon thought these body types correspond to certain temperaments that fit quite closely to popular stereotypes of the modern day. For the ease of recall—‘the skinny nerd’ (ectomorph), ‘the jolly fat man’ (endomorph), ‘the slow-witted tough guy’ (mesomorph). Most scientists consider this theory to be outdated.

Gelder M et al. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, pp. 345–346.

67. C. According to Erikson, older people may look back on their lives with a sense of panic and a feeling that time is running out and chances are used up. This can lead to anxiety disorders. A decline in physical function can contribute to various psychosomatic illness, hypochondriasis, and depression. People who are facing death may find it intolerable not to have been generative or had significant attachments in life. Integrity, according to Erikson, is characterized by an acceptance of life. Without this acceptance people feel a sense of despair, leading to severe depression and suicide in some cases. Generativity is the stage prior to the stage of integrity, between 40 and 65, failure of which leads to stagnation. Intimacy stage is seen between 20 and 40 years, where significant relationships are acquired. A failure of this stage leads to isolation. Identity versus role confusion is seen in the teen years, leading up to 20, during which the individual develops a sense of self.

Sadock BJ and Sadock VA. *Kaplan and Sadock’s Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 210.

68. B. Carl Rogers believed that people are born with a capacity to direct themselves towards a level of completeness called self-actualization. Rogers viewed personality as a dynamic phenomenon, which involves communications, relationships, and self-concepts and which changes regularly. He developed a treatment programme called client-centred psychotherapy. Here the therapist helps the client to achieve their self-actualization by producing an atmosphere conducive to it. The therapist holds the clients with unconditional positive regard, accepting him/her for what he/she is. He encouraged active listening, empathy, and non-directiveness, all principles which have been adopted by mainstream psychiatry. Other therapeutic practices include attention to the present, focus on clients' feelings, emphasis on process, trust in the potential and self-responsibility of clients, and a philosophy grounded in a positive attitude toward them, rather than a preconceived structure of treatment.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 24.

69. E. Rational emotive behaviour therapy was first developed by Albert Ellis, an American psychologist, in the 1950s. It can be considered one of the first forms of cognitive behaviour therapy. The therapy is based on the concept of how people's view of various events can affect the consequences. Typically, a situation (antecedent or A), triggers certain beliefs (B) about A. These beliefs, which are usually dysfunctional, lead to certain behavioural and emotional consequences (C), which are again dysfunctional.

$$\text{A (antecedent)} \rightarrow \text{B (Beliefs)} \rightarrow \text{Consequences (C)}$$

The therapy is directed towards identifying these faulty beliefs and disputing (D) these beliefs. These steps are not very dissimilar from cognitive behaviour therapy, developed by Aaron Beck a decade later.

Froggatt W. *A Brief Introduction To Rational Emotive Behaviour Therapy*. <http://www.rational.org.nz/prof/docs/Intro-REBT.pdf>. Accessed on 11/03/2009.

70. E. Behavioural activation is a treatment for depression developed by Martell. It is now delivered largely as a part of other behavioural and cognitive psychotherapies for depression. Behavioural activation involves the development of activity scheduling; the main focus of activity scheduling is the use of avoided activities as a guide for daily scheduling and functional analysis of cognitive processes that involve avoidance.

Veale D. Behavioural activation for depression. *Advances in Psychiatric Treatment* 2008; **14**: 29–36.

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chapter
4

PHARMACOLOGY

QUESTIONS

- 1. On administration of an unknown dose of a new antipsychotic, a 55-year-old man develops extra pyramidal symptoms. The dose at which this effect appears would be established in which phase of clinical trials?**
 - A. Phase 1
 - B. Phase 2
 - C. Preclinical phase
 - D. Phase 3
 - E. Phase 4

- 2. Haloperidol is more potent than chlorpromazine. Potency of a therapeutic formulation refers to**
 - A. Strength of binding to receptors
 - B. Duration of action at receptors
 - C. Size of the dose required to produce an effect
 - D. Elimination half-life of a drug
 - E. Proportion of available receptors occupied by a drug

- 3. Absorption of orally administered drugs is affected by which of the following**
 - A. Intestinal transit
 - B. Co-administered drugs
 - C. P-glycoprotein
 - D. Presence of food
 - E. All of the above

- 4. Which of the following conditions predisposes to a higher rate of transport through the blood-brain barrier?**
 - A. Presence of ionized drug molecules
 - B. Presence of protein-bound drug molecules
 - C. Presence of water-soluble drug molecules
 - D. Presence of inflamed meninges
 - E. All of the above

- 5. A 72-year-old patient with bipolar illness experiences more side-effects when taking the same medication that he was prescribed 30 years ago, when he was 42 years old. Which of the following is a possible explanation?**
- A. Reduced proportion of body fat
 - B. Increased liver enzyme activity
 - C. Increased renal clearance of drugs
 - D. Increased protein-binding fraction
 - E. All of the above
- 6. Which one of the following has partial agonistic activity as a major therapeutic mechanism?**
- A. Propranolol
 - B. Olanzapine
 - C. Lithium
 - D. Pindolol
 - E. Carbamazepine
- 7. A 44-year-old in-patient, recently started on clozapine, develops exacerbation of chronic sinusitis and appears excessively drowsy. All of the following remedial measures might interfere with clozapine metabolism except**
- A. Coffee
 - B. Quitting smoking
 - C. Amoxicillin
 - D. Erythromycin
 - E. Ciprofloxacin
- 8. Imipramine is a tricyclic antidepressant. Which one of the following is true with respect to imipramine?**
- A. It acts synergistically with ECT.
 - B. Imipramine has no effect in atypical depression.
 - C. Imipramine and CBT are equally effective in severe depression.
 - D. Imipramine decreases non-REM sleep.
 - E. Imipramine is not toxic in overdose.
- 9. Use of stimulants is relatively contraindicated in which of the following patients with ADHD?**
- A. 9-year-old child with a family history of ADHD
 - B. 9-year-old child with a family history of psychosis
 - C. 9-year-old child with ADHD and treatment-emergent tics
 - D. 19-year-old with significant residual symptoms of ADHD
 - E. All of the above

10. Which one of the following is not a dose-dependent side-effect of olanzapine?

- A. Agranulocytosis
- B. Akathisia
- C. Galactorrhoea
- D. Parkinsonism
- E. Sedation

11. An anxious patient who has not responded to initial doses of clozapine titration wants to know about the dose-dependent side-effects of clozapine. Which one of the following is definitely not a dose-related risk?

- A. Seizures
- B. Hypersalivation
- C. Sedation
- D. Agranulocytosis
- E. Anticholinergic effects

12. Acetyl cholinesterase and butyryl cholinesterase are two enzymes metabolizing acetylcholine. Which one of the following antidementia drugs has significant effects on both enzymes?

- A. Galantamine
- B. Rivastigmine
- C. Ginkgo biloba
- D. Memantine
- E. Donepezil

13. A 66-year-old lady being treated for tremors by her neurologist develops insomnia, increased nocturnal myoclonus, and disruptive nightmares following the prescription of a particular medication. The most likely causative agent is

- A. Bromocriptine
- B. Levodopa
- C. Propranolol
- D. Pramipexole
- E. Selegiline

14. A patient treated for severe Parkinson's disease develops troublesome psychotic symptoms attributed to levodopa. The neurologist is reluctant to reduce or stop levodopa given her deterioration in the past when this was attempted. The most appropriate drug to treat her psychotic symptoms is

- A. Olanzapine
- B. Risperidone
- C. Quetiapine
- D. Paliperidone
- E. Bromocriptine

15. Which one of the following drugs denatures the monoamine oxidase enzyme, rendering it ineffective to metabolize even low amounts of tyramine?

- A. Selegiline
- B. Moclobemide
- C. Tranylcypromine
- D. Reboxetine
- E. None of the above

16. Tyramine is present in certain food substances and can cause hypertensive crises if consumed by a patient on monoamine oxidase inhibitors. Choose the site of action of tyramine from the following options

- A. Presynaptic storage vesicles
- B. Reuptake channels
- C. α_1 adrenergic receptors
- D. β adrenergic receptors
- E. α_2 autoreceptors

17. Which one of the following antidepressants can block the neuronal uptake of tyramine and potentially reduce the risk of tyramine–MAOI interaction?

- A. SSRIs
- B. Moclobemide
- C. L-tryptophan
- D. Tricyclic antidepressants
- E. Levothyroxine

18. Which one of the following mood stabilizers can potentiate GABA transmission by increasing GABA release, reducing GABA metabolism, and increasing GABA receptor density?

- A. Lithium
- B. Carbamazepine
- C. Lamotrigine
- D. Valproate
- E. Vigabatrin

19. Which one of the following benzodiazepines has partial agonistic action at some receptors, leading to fewer withdrawal symptoms?

- A. Diazepam
- B. Triazolam
- C. Lorazepam
- D. Clonazepam
- E. Chlordiazepoxide

- 20. A patient presents with recurrent episodes of feeling detached and unreal. A pharmacological agent that can worsen the above symptoms is**
- A. Clozapine
 - B. Caffeine
 - C. Lamotrigine
 - D. Clonazepam
 - E. Valproate
- 21. A 64-year-old man with schizophrenia is being treated for cirrhotic liver. Unfortunately, he develops a relapse of psychotic symptoms and needs a change in his antipsychotic prescription. The safest option with regard to his hepatic status is**
- A. Amisulpride
 - B. Olanzapine
 - C. Clozapine
 - D. Risperidone
 - E. Chlorpromazine
- 22. The mechanism of action of St John's wort is**
- A. Serotonin antagonism
 - B. Norepinephrine agonism
 - C. MAO inhibition
 - D. Multiple reuptake inhibition
 - E. Membrane stabilization
- 23. Which one of the following acts via opiate receptors and could be a potential agent to prevent relapse of alcohol use?**
- A. Naloxone
 - B. Acamprosate
 - C. Disulfiram
 - D. Naltrexone
 - E. Bupropion
- 24. A 44-year-old man with bipolar disorder treated with lithium develops chronic back pain. His GP wants to prescribe a NSAID analgesic and asks you to choose a NSAID with the least potential to interact with lithium. You will choose**
- A. Ibuprofen
 - B. Diclofenac
 - C. Aspirin
 - D. Ketorolac
 - E. Indomethacin

25. Stimulants are useful in ADHD. The symptom that best responds to stimulants is

- A. Insomnia
- B. Hyperactivity
- C. Inattention
- D. Motor tics
- E. Conduct disturbance

26. Atomoxetine is useful in children with ADHD. The mechanism of action is by

- A. Norepinephrine reuptake inhibition
- B. Serotonin potentiation
- C. GABA potentiation
- D. Membrane stabilization
- E. Acetylcholine synthesis

27. A 30-year-old known heroin user is brought to A&E after an overdose of heroin, with a GCS of 3, a respiratory rate of four breaths per minute, and pinpoint pupils. On administration of naloxone he develops running nose, diarrhoea and profuse sweating, and multiple joint aches. The most likely explanation is

- A. Residual symptoms of toxicity
- B. Allergic reaction to naloxone
- C. Effect of coadministered cocaine
- D. Precipitated opioid withdrawal
- E. None of the above

28. A 30-year-old known heroin user develops opioid intoxication which reverses on administration of naloxone. He takes a self-discharge against medical advice. He was brought back within a few hours of this self-discharge with signs suggestive of opioid intoxication, but without any history of additional opioid intake. The most likely explanation is

- A. Inappropriate dose of naloxone
- B. Inappropriate route of administration of naloxone
- C. Short half-life of naloxone
- D. Reduced opioid tolerance on administering naloxone
- E. None of the above

29. Naloxone can be life-saving in cases of opioid toxicity. The commonest route of administration of naloxone for this purpose is

- A. Subcutaneous
- B. Intramuscular
- C. Transtracheal
- D. Intrathecal
- E. Intravenous

30. Lofexidine is useful in managing symptoms of opiate withdrawal.

The mechanism of action of lofexidine is by

- A. Agonism of α_2 autoreceptors
- B. Direct opioid antagonism
- C. Partial opioid agonism
- D. Direct dopamine blockade
- E. Spinal opiate receptor blockade

31. Fluoxetine increases the clinical efficacy of clozapine through which of the following pharmacokinetic mechanism?

- A. Increased plasma protein binding
- B. Increased intestinal absorption
- C. Inhibition of hepatic metabolism
- D. Reduced renal clearance
- E. Improved blood-brain barrier penetration

32. Tyramine can produce the ‘cheese reaction’ in patients taking MAO inhibitors. Which one of the following is true with respect to the moclobemide-tyramine interaction?

- A. Moclobemide does not cause cheese reaction with tyramine
- B. Moclobemide causes cheese reaction at the same frequency as phenelzine
- C. Moclobemide does not act on the same enzyme that metabolizes tyramine
- D. Large consumption of tyramine can produce the cheese reaction with moclobemide
- E. All of the above

33. Which one of the following is a partial opioid agonist with a low intrinsic activity?

- A. Naloxone
- B. Naltrexone
- C. Methadone
- D. Buprenorphine
- E. None of the above

34. A 12-year-old child treated for ADHD with stimulants develops tics, which persist even on withdrawal of stimulants. Which of the following offers a potential to treat both tics and ADHD symptoms simultaneously?

- A. Clonidine
- B. Lofexidine
- C. Bromocriptine
- D. Atomoxetine
- E. Risperidone

35. A 40-year-old male develops impotence secondary to antidepressant therapy. After trying various options, you are considering sildenafil. The mechanism of action of sildenafil is by

- A. Phosphodiesterase inhibition
- B. Acetylcholine stimulation
- C. Increasing nitric oxide production
- D. Blockade of sympathetic discharge
- E. None of the above

36. Buspirone is an anxiolytic with no immediate effect on acute administration, unlike diazepam. This is due to

- A. Short half-life of buspirone
- B. Longer time required to achieve steady state
- C. Buspirone follows first-order kinetics
- D. Buspirone is a GABA partial agonist
- E. Buspirone acts via the serotonin system

37. Most diuretics interact with lithium to produce significant changes in plasma lithium levels. Which one of the following diuretics is useful in treating polyuria, a common side-effect of lithium?

- A. Amiloride
- B. Triamterene
- C. Chlorothiazide
- D. Furosemide
- E. None of the above

38. A 30-year-old woman was diagnosed with paranoid schizophrenia. She has been hospitalized and is prescribed antipsychotics. Which one of the following treatment-emergent conditions is known to be associated with the risk of suicide?

- A. Akathisia
- B. Anticholinergic symptoms
- C. Dystonia of the laryngeal muscles
- D. Neuroleptic malignant syndrome
- E. Tardive dyskinesia

39. For typical neuroleptics, the antipsychotic effect on positive psychotic symptoms is strongly correlated with

- A. D2 occupancy
- B. Half-life
- C. D4 occupancy
- D. 5-HT antagonism
- E. None of the above

40. Memantine is an antidementia drug licensed for moderately severe Alzheimer's dementia. The mechanism by which memantine acts is

- A. Inhibition of NMDA receptor
- B. Inhibition of calcium ion channels
- C. Stimulation of GABA output
- D. Stimulation of glutamate release
- E. Mimicking the effects of acetylcholine

41. Phenytoin and lithium are said to have narrow therapeutic indices.

The term therapeutic index refers to

- A. Ratio between median toxic and median effective dose
- B. Rate of production of toxic effects at a constant dose
- C. Duration of persistence of toxic effects after the onset
- D. Proportion of patients who experience a specific side-effect
- E. None of the above

42. The lower incidence of extrapyramidal side-effects due to clozapine compared to haloperidol is possibly related to

- A. Duration of D2 receptor occupancy
- B. Glutamate blockade
- C. GABA release at basal ganglia
- D. Intrinsic partial agonistic activity at the D2 receptor
- E. All of the above

43. The volume of distribution of a drug depends on all of the following except

- A. Protein binding
- B. Lipid solubility
- C. Tissue binding
- D. Half-life
- E. None of the above

44. Drug A is an anticonvulsant, metabolized to inactive metabolites by the CYP450 system. Drug B, which induces CYP450, is expected to produce which one of the following if coadministered with drug A?

- A. Reduced concentration of inactive metabolites
- B. Reduced efficacy of drug A
- C. Increased metabolism of drug A resulting in increased efficacy
- D. Increased concentration of drug A in plasma
- E. None of the above

- 45. Glucuronyl transferase acts on an antidepressant drug A and converts it into a more water-soluble component with less potency but a higher concentration in bile. This process is called**
- A. Conjugation
 - B. Oxidation
 - C. Saponification
 - D. Depolarization
 - E. Enzyme induction
- 46. Metabolism of psychotropic drugs include phase 1 and phase 2 reactions. All of the following are phase 2 reactions except**
- A. Glucuronidation
 - B. Methylation
 - C. Oxidation
 - D. N acetylation
 - E. Sulfation
- 47. Breastfeeding is contraindicated when certain psychotropics are administered. The characteristic features of such psychotropics that are secreted in breast milk include all except**
- A. High lipid solubility
 - B. High degree of ionization
 - C. Poor protein binding
 - D. Low acidic property
 - E. All of the above
- 48. A 25-year-old postgraduate student is suffering from initial insomnia during his final year of study. He is asking for a hypnotic that will cause least disturbance to his sleep architecture. The best choice is**
- A. Diazepam
 - B. Chloral hydrate
 - C. Zolpidem
 - D. Promethiazine
 - E. Temazepam
- 49. Selegiline is used as an antiparkinsonian agent. Its mechanism of action is**
- A. Dopamine receptor agonism
 - B. Increased dopamine synthesis
 - C. COMT inhibition
 - D. MAO-A inhibition
 - E. MAO-B inhibition

50. Which of the following antidepressants is most selectively serotonergic?

- A. Fluoxetine
- B. Paroxetine
- C. Citalopram
- D. Clomipramine
- E. Venlafaxine

51. Which one of the following antipsychotics is strongly implicated in deaths due to QTc prolongation?

- A. Quetiapine
- B. Olanzapine
- C. Pimozide
- D. Risperidone
- E. Aripiprazole

52. Which one of the following anticonvulsants follows zero-order kinetics on dose increase within therapeutic range?

- A. Gabapentin
- B. Phenytoin
- C. Ethosuximide
- D. Valproate
- E. Lamotrigine

53. A patient suffering from gastritis is prescribed several psychotropic medications. She wants to know which part of her body will absorb most of these orally administered drugs. The correct answer is

- A. Oral mucosa
- B. Large intestine
- C. Oesophagus
- D. Stomach
- E. Small intestine

54. A patient started on antidepressant treatment for a first episode of depression stopped the medication abruptly after an initial response. Which one of the following medications, if prescribed, has the highest chance of causing the most troublesome discontinuation reaction?

- A. Mirtazapine
- B. Mianserin
- C. Fluoxetine
- D. Paroxetine
- E. Moclobemide

- 55. A patient started on paroxetine after the first episode of depression stopped the medication abruptly following an initial response. Apart from short half-life, higher incidence of discontinuation reaction following paroxetine is attributed to**
- A. Cholinergic rebound
 - B. Poor plasma protein binding
 - C. High blood-brain barrier penetration
 - D. Higher addictive potential
 - E. None of the above
- 56. The tricyclic antidepressant which is most lethal on overdose is**
- A. Dosulepin
 - B. Imipramine
 - C. Lofepramine
 - D. Clomipramine
 - E. Nortriptyline
- 57. A patient develops neuroleptic malignant syndrome secondary to antipsychotic prescription. Which one of the following properties of antipsychotics predicts a lower risk of producing neuroleptic malignant syndrome?**
- A. High anticholinergic property
 - B. High sedative effect
 - C. Strong dopamine blockade
 - D. α adrenergic blockade
 - E. High potency
- 58. Which one of the following agents produces dysphoria, myoclonus, flu-like symptoms, ataxia, hyperacusis, and anxiety on withdrawal?**
- A. Opioids
 - B. Benzodiazepines
 - C. Cannabis
 - D. Procyclidine
 - E. Amphetamines
- 59. Among antipsychotic agents, a high anticholinergic effect is noted for which one of the following pairs?**
- A. Chlorpromazine and haloperidol
 - B. Thioridazine and chlorpromazine
 - C. Thioridazine and haloperidol
 - D. Chlorpromazine and risperidone
 - E. Risperidone and paliperidone

60. Severe perspiration unrelated to ambient temperature is a side-effect associated with the prescription of

- A. SSRIs
- B. Venlafaxine
- C. TCAs
- D. All of the above
- E. None of the above

61. A 55-year-old patient with late-onset schizophrenia develops dystonia on administration of antipsychotics. He is prescribed anticholinergic medications for this side-effect. Which one of the following anticholinergic drugs is most stimulating in its properties?

- A. Trihexyphenidyl
- B. Procyclidine
- C. Benztropine
- D. Biperiden
- E. Orphenadrine

62. A 55-year-old patient with late-onset schizophrenia develops dystonia on administration of antipsychotics. He is prescribed anticholinergic medications for this side-effect. Which one of the following anticholinergic drugs has the least abuse potential due to a relative lack of stimulating properties?

- A. Trihexyphenidyl
- B. Procyclidine
- C. Benztropine
- D. Biperiden
- E. Orphenadrine

63. A 55-year-old patient with late-onset schizophrenia develops dystonia on administration of antipsychotics. He is prescribed trihexyphenidyl for this side-effect. Which one of the following properties makes this drug most stimulating of all anticholinergics?

- A. Dopamine agonistic effect
- B. Nicotinic stimulation
- C. Endorphin release
- D. Stimulation of cannabinoid receptors
- E. None of the above

64. All of the following measures help to reduce postural tremors induced by lithium therapy except

- A. Reducing caffeine intake
- B. Using propranolol
- C. Administering lithium at bed time
- D. Dose reduction
- E. Using procyclidine

65. The half-life of donepezil in an elderly patient with dementia is around

- A. 70 hours
- B. 24 hours
- C. 12 hours
- D. 6 hours
- E. 3 hours

66. A patient taking disulfiram to support abstinence from alcohol decides to yield to his temptation and starts drinking but only a day after stopping disulfiram. Which one of the following is correct in this scenario?

- A. Disulfiram irreversibly damages alcohol dehydrogenase.
- B. Disulfiram has a half-life of around 100 hours.
- C. Severity of the interaction does not depend on the dose of either agent.
- D. Disulfiram competitively inhibits aldehyde dehydrogenase.
- E. None of the above.

67. Smoking can reduce extrapyramidal side-effects caused by antipsychotics through

- A. Induction of hepatic metabolism of antipsychotics
- B. Increased renal elimination of antipsychotics
- C. Intestinal ischaemia reducing drug absorption
- D. Effect of nicotine on skeletal muscles
- E. None of the above

68. Acamprosate is used in the management of alcohol dependence. Which of the following is correct?

- A. Acamprosate must be started preferably 2 weeks before the deadline to stop drinking.
- B. Acamprosate is started only after abstinence is achieved.
- C. Acamprosate has no demonstrable effect on craving.
- D. Consuming alcohol when taking acamprosate will produce fatal toxicity.
- E. Acamprosate increases levels of disulfiram to a toxic range.

69. The most common reason for using dantrolene sodium in psychiatric patients is

- A. Serotonin syndrome
- B. Catatonia
- C. Neuroleptic malignant syndrome
- D. Dystonia
- E. Chorea

70. Which of the following is correctly paired?

- A. Pimozide: phenothiazine
- B. Chlorpromazine: diphenyl butyl piperidine
- C. Trifluperazine: aliphatic phenothiazine
- D. Thioridazine: dibenzoxapine
- E. Haloperidol: butyrophenone

71. The most prominent mechanism of action of lamotrigine is

- A. Calcium channel blockade
- B. Voltage-sensitive sodium channel blockade
- C. Glutamate antagonism
- D. Serotonin reuptake inhibition
- E. GABA potentiation

72. The ECG changes produced by long-term lithium therapy mimic which one of the following electrolyte disturbances?

- A. Hyperkalaemia
- B. Hypokalaemia
- C. Hypocalcaemia
- D. Hypercalcaemia
- E. Hyperuricaemia

73. A 34-year-old lady with bipolar disorder responds well to lamotrigine. She develops a minor maculopapular rash 6 months after the onset of treatment. The most appropriate line of action is

- A. Discontinue lamotrigine
- B. Persevere with lamotrigine as the rash is only minor
- C. This is very common and needs antihistaminic prescription
- D. Refer to dermatology but continue lamotrigine
- E. Reassure the patient and reduce the dose

74. ECT is widely used to treat resistant and psychotic depression. Which of the following statements is correct with respect to the clinical use of ECT?

- A. Seizure threshold varies widely among different individuals.
- B. Seizure threshold is fixed for each individual once the treatment is started.
- C. No correlation exist between electrical dose and amnesia.
- D. Incidence of cognitive disturbance is irrespective of the weekly frequency of administration.
- E. None of the above.

75. Which one of the following antidepressants resembles amphetamine in chemical structure?

- A. Buspirone
- B. Bupropion
- C. Imipramine
- D. Nortriptyline
- E. Duloxetine

76. Which of the following antidepressants is used by urologists for patients with incontinence?

- A. Citalopram
- B. Nortriptyline
- C. Paroxetine
- D. Duloxetine
- E. Venlafaxine

77. Which one of the following can increase plasma levels of lamotrigine?

- A. Lorazepam
- B. Chlorpromazine
- C. Valproate
- D. Carbamazepine
- E. Zopiclone

78. One of your regular out-patients with recurrent depression was recently started on a medication but comes back with aggravated psoriatic skin lesions. The most probable offending agent is

- A. Lithium
- B. Valproate
- C. Olanzapine
- D. Zopiclone
- E. Chlorpromazine

79. A 34-year-old man taking lithium twice daily experiences side-effects. Your consultant has advised him to take it once daily to reduce the side-effect. Which one of the following side-effects may respond to this intervention?

- A. Fine tremors
- B. Lethargy
- C. Polyuria
- D. Hypothyroidism
- E. Gastrointestinal distress

80. An intoxicated patient needs prescription for alcohol withdrawal. He is known to have cirrhosis with ascites. The benzodiazepine of choice is

- A. Diazepam
- B. Chlordiazepoxide
- C. Alprazolam
- D. Midazolam
- E. Oxazepam

81. Regular, long-term prescription of anticholinergics increases the risk of

- A. Akathisia
- B. Dystonia
- C. Parkinsonism
- D. Tardive dyskinesia
- E. Torticollis

82. Select one drug associated with gastrointestinal bleeding

- A. Benzodiazepines
- B. SSRIs
- C. MAOIs
- D. Methadone
- E. Bupropion

83. Which of the following is a partial agonist at nicotinic acetylcholine receptors that can be used to promote smoking cessation?

- A. Varenicline
- B. Bupropion
- C. Ticarcilline
- D. Dosulepin
- E. Gallantamine

84. A 48-year-old man taking multiple drugs for hypertension, diabetes, and bipolar disorder presents with disabling impotence. Which of the following drugs that he might be using is not associated with sexual dysfunction?

- A. Atenolol
- B. Fluphenazine
- C. Glibenclamide
- D. Thiazide diuretics
- E. α_1 -blocker

85. A 40-year-old man with chronic dysthymia also suffers from impotence unrelated to his depression. His GP prescribes him a medication to be used prior to the sexual act, as and when required. Which of the following describes the most likely mechanism of action of the prescribed drug?

- A. Prostaglandin precursor
- B. Selective phosphodiesterase type 5 inhibition
- C. Selective serotonin uptake inhibition
- D. Dopamine agonist
- E. α adrenoceptor blockade

86. Which of the following opioids produces metabolites with clinically useful analgesic activity?

- A. Naloxone
- B. Nomifensine
- C. Propoxyphene
- D. Codeine
- E. Naltrexone

87. The mechanism of action of opioids in producing an analgesic effect is

- A. Blockade of sodium channels on the neuronal membrane (membrane stabilization)
- B. Increased production of cAMP in a neurone
- C. Reduction in intracellular calcium in a neurone
- D. Stimulation of Gs-protein-coupled receptors in the neurone
- E. Direct action on nuclear transcription factors

88. Methylxanthines produce stimulation of the CNS via their action on which of the following receptors?

- A. NMDA receptors
- B. Adenosine receptors
- C. Nicotinic receptors
- D. GABA receptors
- E. Cholinergic muscarinic receptors

89. Which of the following medications used for Parkinson's disease is correctly paired with its side-effect?

- A. Levodopa–hypoglycaemia
- B. Bromocriptine–hyperprolactinaemia
- C. Amantadine–livedo reticularis
- D. Tolcapone–gouty arthritis
- E. Bromocriptine–aplastic anaemia

90. Which of the following agents acts through glial/ neuronal GABA reuptake inhibition?

- A. Zopiclone
- B. Vigabatrin
- C. Topiramate
- D. Tiagabine
- E. Gabapentin

91. Which of the following neuropharmacological agents is described as a melatonergic antidepressant?

- A. Agomelatine
- B. L-tryptophan
- C. Melatonin
- D. Modafinil
- E. Ropinirole

92. Which of the following medications can be used to treat narcolepsy and associated sleep disorders?

- A. Buprenorphine
- B. Fluoxetine
- C. Imipramine
- D. Modafinil
- E. Naloxone

93. Which of the following drugs has some evidence for the treatment of resistant depression as an augmenting agent to SSRIs?

- A. Atenolol
- B. Labetolol
- C. Pentazocine
- D. Pindolol
- E. Tramadol

94. The half-life of atomoxetine in most individuals is

- A. 2 weeks
- B. 24 hours
- C. 36 hours
- D. 5 days
- E. 5 hours

95. Which of the following is considered to be the safest of all MAO-A inhibitors when used in combination with other antidepressants to treat depression?

- A. Isocarboxazid
- B. Isoniazid
- C. Phenelzine
- D. Selegiline
- E. Tranylcypromine

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1.A. The dose at which side-effects develop is often determined at phase 1 of clinical trials. The pathway that a drug must follow before approval and marketing starts with animal studies, where the molecule is demonstrated to have specific actions. These extensive, preclinical animal studies must be carried out on at least two different animal species. Mutagenicity, carcinogenicity, and organ system toxicity are studies at this phase. A new drug under investigation then enters human trials. The first phase consists of determining if the drug is safe on human subjects. It is administered to a small group of volunteers and safety, tolerability, and pharmacokinetics of the drug are ascertained. In phase 2, effectiveness in comparison to placebo is studied in hundreds of patients with the target disease to see if it works at all against the disease. In phase 3, the drug undergoes extensive double-blind, randomized controlled trials to determine how well it works and what are the common side-effects. Phase 4 takes place if all the previous phases are successfully crossed—the drug undergoes the approval process by regulatory bodies and postmarketing surveillance ensues. Less common side-effects, which sometimes could lead to a drug's withdrawal, can be picked up when large-scale prescribing takes place during postmarketing surveillance.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004. p. 2708.

2.C. Potency of a drug with receptor-binding action refers to the amount of the drug needed to produce a particular effect compared to another standard drug with similar receptor profile ('vigour'). Affinity refers to the ability of the drug to bind to its appropriate receptor ('affection'). Efficacy refers to how well the drug produces the expected response, that is the maximum clinical response produced by a drug ('productivity'). Efficacy depends on affinity, potency, duration of receptor action in some cases, and kinetic properties such as half-life, among other factors. Haloperidol is more potent than chlorpromazine as approximately 5 mg of haloperidol is required to achieve the same effect as 100 mg of chlorpromazine. These drugs, however, are equal in the maximal clinical response achievable using them, that is equally efficacious but not equipotent.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 985.

3.E. After oral administration, a drug may be incompletely absorbed. This is mainly due to lack of absorption from the intestine related to the presence of inhibitory factors such as food or gastric acid, or to changes in intestinal motility; for example having diarrhoea or vomiting can affect drug absorption. Inherent properties of certain drugs can also affect their absorption, for example highly hydrophilic drugs cannot cross the lipid cell membrane, while highly lipophilic drugs will struggle to cross the water layer in extracellular space. Presence of reverse transporters, such as P-glycoprotein, can affect drug absorption. P-glycoprotein pumps certain drug molecules actively out into the gut lumen from gut cells. Inhibition of P-glycoprotein and gut wall metabolism, for example by grapefruit juice, can increase absorption of certain (mostly non-psychotropic) medications.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004, p. 2700.

4.D. The blood–brain barrier poses a special challenge to the transit of drug molecules into the brain, which is very important to ensure the activity of most psychotropics. The blood–brain barrier is a structural and functional barrier comprised of capillary endothelium of brain, which possesses tight junctions, acting in unison as a single sheet or membrane. These junctions are disrupted when meningitis or other inflammation affects the structure. The ability of a drug to pass the blood–brain barrier depends on its molecular size, lipid solubility, and ionic status. Unionized molecules that are freely available and less protein bound are transported across the barrier easily. In general, the higher the lipid water partition coefficient, the greater the ability to cross the barrier. Exceptionally, there are a few molecules that pass the barrier effectively in spite of having a low lipid–water partition coefficient. These have specific carrier mechanisms, for example amino acid transport system (this is stereo specific, so that L amino acids but not D amino acids are easily transferred). L-dopa and valproate have specific carrier mechanisms. Some areas of brain lack this barrier—subfornical organ, area postrema, and median eminence. These circumventricular organs allow transfer of many compounds from blood to brain. This may have a survival benefit as certain toxic substances stimulate the area postrema and induce nausea and vomiting.

Johnstone E et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 38.

5.A. Pharmacokinetic changes in old age are pertinent when considering initiation, dosing, and coadministration of medications in the elderly. In general, the ability to absorb an orally administered medication is not greatly affected, but elderly patients have less body fat, and so lipid-soluble drugs may be distributed to brain tissue more avidly. However, this effect is not universal for all drugs. Protein binding and hepatic metabolism are reduced in elderly people, especially when malnourished. Renal function invariably drops with age. Note that this question is non-specific with respect to the prescribed drug.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1278.

6.D. Pindolol is a partial agonist at β -receptor sites. In addition, it is a 5-HT_{1A} antagonist and has been studied as an augmenting agent with antidepressants. The final common pathway of action of most psychotropics is interference with neurotransmitter function. In general, neurotransmitters are released from a presynaptic neurone, occupy a receptor in a postsynaptic neurone, and bring about a change in the activity of the postsynaptic neurone. If a drug acts in a similar fashion to a neurotransmitter and brings about a similar change in the postsynaptic neurone, then it is called an agonist. This is often due to the intrinsic activity of the drug molecule on the specific receptors. Certain drugs occupy the receptors and do not have any intrinsic activity; they simply stop the neurotransmitter from carrying out its routine function. These drugs are called antagonists for the particular receptor. Certain other drugs have a degree of intrinsic activity; thus, when there is no indigenous neurotransmitter in the vicinity, they can produce a degree of effect similar to the neurotransmitter but if these molecules are allowed to compete with the indigenous neurotransmitters, this becomes counter productive. They block the full action that could be provided by the neurotransmitter. Hence, these are called partial agonists. Propranolol is a β -agonist with both β_1 - and β_2 -antagonistic properties. Olanzapine is predominantly a serotonin (5-HT_{2A}) and dopamine antagonist (D2). Carbamazepine is a membrane-stabilizing agent while the mechanism of action of lithium is thought to be mediated via the second messenger inositol system. The anxiolytic buspirone is a partial agonist at 5-HT_{1A} autoreceptors. Aripiprazole is also a partial agonist at dopamine receptors.

Oliver JS, Cryan JF, Burrows GD et al. Pindolol augmentation of antidepressants: a review and rationale. *Australian and New Zealand Journal of Psychiatry* 2000; **34**: 71–79.

7.C. Amoxicillin is largely cleared through the kidneys and does not interfere with clozapine metabolism. Clozapine undergoes hepatic metabolism via CYP1A2, CYP3A4, and CYP2D6. Ciprofloxacin and other fluoroquinolone antibiotics can inhibit CYP1A2 and affect clozapine levels. Smoking induces CYP1A2 and quitting it will lead to a rebound inhibition effect on the enzyme appearing after 2 to 4 weeks. Byproducts of tobacco smoking, particularly the polycyclic aromatic hydrocarbons, are the major offenders in this regard. The metabolic inductive effects are not specific to tobacco smoking as they can also be expected from marijuana smoking. Erythromycin inhibits CYP3A4; this may lead to increase in clozapine levels. Caffeine has the opposite effect of smoking on clozapine metabolism. It inhibits CYP1A2 enzyme, leading to higher clozapine levels.

Worrel JA, Marken PA, Beckman SE et al. Atypical antipsychotic agents: A critical review. *American Journal of Health-System Pharmacy* 2000; **57**: 238–255.

8.A. Imipramine seems to be synergistic with ECT; it is shown to be more effective than SSRIs in preventing relapse following ECT in depressed patients (Lauritzen et al., 1996). Monoamine oxidase inhibitors have been shown to be more effective than tricyclics in atypical depressive disorders with biological features such as increased sleep and increased appetite. Though imipramine may not be as effective as MAOIs, it has been shown to be better than placebo in atypical depression. An often-quoted study that undertook head-to-head comparison of CBT and imipramine is the National Institute of Mental Health Depression Study (Elkin et al., 1989). In this study 16 weeks of CBT, imipramine, interpersonal therapy (IPT), and placebo were compared. Among the less-severely depressed patients, comparable proportions achieved remission in all three active treatment arms; but among the more-depressed patients, imipramine was superior to CBT in terms of remission rates achieved. Imipramine alters sleep structure considerably; it reduces REM (rapid eye movement) sleep and increases NREM (non-REM) sleep. All tricyclics are toxic in overdose; tertiary amines such as amitriptyline and imipramine produce longer-acting metabolites and have higher toxic potential than secondary amines.

Elkin I, Shea T, Watkins JT et al. National Institute of Mental Health treatment of depression collaborative research program. *Archives of General Psychiatry* 1989; **46**: 971–982.

Lauritzen L, Odgaard K, Clemmesen L et al. Relapse prevention by means of paroxetine in ECT-treated patients with major depression: a comparison with imipramine and placebo in medium-term continuation therapy. *Acta Psychiatrica Scandinavica* 1996; **94**: 241–251.

McGrath PJ, Stewart JW, Janal MN et al. A placebo-controlled study of fluoxetine versus imipramine in the acute treatment of atypical depression. *American Journal of Psychiatry* 2000; **157**: 344–350.

9.C. Treatment-emergent tics and dyskinesias are often self-limited over 7 to 10 days in children taking stimulants. In some cases, if the severity of tics necessitates a dose reduction, adjustments can be made in the medication dosage. In severe cases, atomoxetine could be prescribed after stopping stimulants. Methylphenidate may also worsen already existing tics in one-third of patients. In most of these cases tics are variable, depending on the plasma levels. They resolve immediately on clearance of the drug. In the rest, tics are triggered by the treatment and persist for several months. It is appropriate to continue treating an adult with residual, disabling symptoms of ADHD. Though stimulants can exacerbate psychosis, a family history of psychosis is not a contraindication. Family history of ADHD does not adversely influence stimulant prescription.

Taylor D et al., eds. *The Maudsley Prescribing Guidelines*, 9th edn. Informa Healthcare, 2007, p. 281.

10.A. Olanzapine can induce agranulocytosis, similar to clozapine albeit at much lower frequency. Atypicality of atypical antipsychotics does not exist as a dichotomous entity from typical drugs. At high doses, most atypical agents lose their atypicality and produce extrapyramidal symptoms and galactorrhoea. Large weight gains with increased appetite occur during the first 6 months of treatment, irrespective of the dose used. The risk of weight gain continues over time, probably reaching a peak after 9 months, after which it slows down but continues as long as one takes the drug. Weight gain is associated with increased total cholesterol. Olanzapine is also associated with dose-dependent sedation, though tolerance usually develops for this effect.

Tolosa-Vilella C et al. Olanzapine-induced agranulocytosis: a case report and review of the literature. *Progress in Neuro-psychopharmacology and Biological Psychiatry* 2002; **26**: 411–414.

11.D. Agranulocytosis is not dose dependent; it is idiosyncratic. A reduction in dose of clozapine cannot help a patient who has developed agranulocytosis. Clozapine-associated seizures are clearly dose related. When doses of clozapine below 300 mg/day are used, the seizure rate remains 1%; further doses between 300 and 600 mg/day increase the seizure rate to 2.7%, and doses above 600 mg/day have a rate of 4.4%. Slower dose titration, using a lower dose, and the addition of anticonvulsant agent such as valproic acid can reduce the frequency of seizures. Anticholinergic effects, such as tachycardia and constipation, may be dose dependent, and are often noted in overdoses. Similar to sialorrhoea, clozapine-related tachycardia is often seen in early phases of treatment, and tolerance develops in due course.

Taylor D et al., eds. *The Maudsley Prescribing Guidelines*, 9th edn. Informa Healthcare, 2007, pp. 71, 73, and 81.

12.B. Donepezil and galantamine are selective inhibitors of acetylcholinesterase enzyme. Rivastigmine affects both butyryl and acetyl cholinesterase. Galantamine also affects nicotinic receptors. However, these differences do not translate into significant clinical differences in efficacy or tolerability. Memantine is an N-methyl-D-aspartic acid (NMDA) antagonist and hence is thought to be a neuroprotective agent. Tacrine was one of the foremost anticholinesterases introduced but is no longer used due to hepatotoxic effects. Tacrine inhibits both acetyl and butyrylcholinesterases. Ginkgo biloba is widely used in Germany as a cognitive enhancer. Its mechanism of action is unclear.

Taylor D et al., eds. *The Maudsley Prescribing Guidelines*, 9th edn. Informa Healthcare, 2007, p. 415. Leonard BE. Pharmacotherapy in the treatment of Alzheimer's disease: an update. *World Psychiatry* 2004; **3**: 84–88.

13.B. Levodopa is used to treat symptoms of Parkinson's disease. Levodopa is associated with increase in libido; in some cases secondary mania is reported. It can cause disruptive nightmares and forced reminiscences. It is a stimulating medication and can produce initial insomnia and nocturnal myoclonus. It is also associated with blepharospasms. Bromocriptine and pramipexole are dopamine agonists while selegiline is a monoamine oxidase B (MAO-B) inhibitor used in treating Parkinson's disease.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004, p. 410.

14. C. Psychosis is common in patients with Parkinson's disease. This may be due to the use of dopaminergic medications such as levodopa or unrelated to the pathology of Parkinson's disease. Lewy body dementia can result in psychotic features and prominent parkinsonism, in which case antipsychotic treatment may be required. In such cases and in levodopa-induced psychosis, quetiapine has been used as the treatment of choice as it has a very low extrapyramidal side-effects profile. Clozapine is also equally useful and generally regarded as the gold standard. In Parkinson's disease-related psychosis even low doses of atypical antipsychotics can result in good efficacy.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004, p. 411.

15. C. Tyramine is predominantly metabolized by MAO-A enzyme present in gut wall and liver, apart from brain and other tissues. Drugs which irreversibly inhibit MAO-A affect tyramine metabolism. These include tranylcypromine and phenelzine. Drugs such as selegiline are irreversible MAO-B selective inhibitors; they do not have the same effect on tyramine as MAO-A inhibitors. Moclobemide is a reversible, somewhat competitive MAO-A selective inhibitor. Thus, when the relative amount of tyramine in the vicinity increases, the moclobemide molecule makes way for tyramine from the MAO-A enzyme site. Reboxetine is not an MAO inhibitor.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004, p. 2855.

16.A. Tyramine is a monoamine naturally occurring in many food substances. Generally, most ingested tyramine undergoes a complete breakdown in the periphery due to the action of MAO-A enzyme in gut mucosa and liver. When a patient is taking MAO-A inhibitor drugs, tyramine escapes such degradation and enters the brain through amino acid transport. It uses the norepinephrine reuptake channels, and gains entry to presynaptic neurones. Here, tyramine stimulates release of all bound monoamines, especially norepinephrine, leading to a hypertensive reaction. This is called the cheese reaction as tyramine is abundant in mature cheeses.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004, p. 2860.

17. D. As tyramine gains entry to presynaptic neurones via the norepinephrine transporter, blocking this reuptake transporter can prevent tyramine action, at least theoretically. Tricyclic antidepressants act via blockade of this transporter. Hence the incidence of cheese reaction due to tyramine is less in those who are on tricyclic antidepressants before the commencement of MAO-A inhibitors. However, such combination is not advisable as the potential to cause serotonin syndrome is very high. SSRIs and L-tryptophan can increase the risk of serotonin syndrome many fold when coprescribed with MAO-A inhibitors.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004, p. 2965.

White K and Simpson G. Combined MAOI-tricyclic antidepressant treatment: a re-evaluation. *Journal of Clinical Psychopharmacology* 1981; **1**: 264–282.

18. D. The mechanism of action of lithium remains speculative. Valproate increases gamma-aminobutyric acid (GABA) release and reduces GABA metabolism. It increases neuronal responsiveness to GABA and also increases GABA_A receptor density. Carbamazepine prolongs sodium channel inactivation, leading to a secondary increase in calcium channel inactivation. This is linked to reduced glutamatergic neurotransmission. Carbamazepine also has adenosine antagonistic properties. Lamotrigine acts via membrane stabilization while vigabatrin is a GABA transaminase inhibitor.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004, p. 2757.

19. D. Clonazepam has partial agonistic action at certain benzodiazepine receptors, leading to fewer withdrawal symptoms. Clonazepam is a high-potency drug (0.25 mg clonazepam is equated to 5 mg diazepam); it is shown to be effective in panic disorder and social phobia (but is not recommended for long-term therapy). In bipolar type 1 disorder, clonazepam may result in a prolonged remission phase and reduced depressive relapses when used as an adjuvant to lithium or lamotrigine, respectively.

Haefely W et al. Novel anxiolytics that act as partial agonists at benzodiazepine receptors. *Trends in Pharmacological Science* 1990; **11**: 452–456.

20. D. Caffeine can worsen depersonalization. Experimental induction of depersonalization and derealization has been tried using caffeine. SSRIs are used in treating established cases of depersonalization disorder. However, paradoxically, some times initiation or discontinuation of SSRIs can produce depersonalization experiences. Lamotrigine and clonazepam are used in treating symptoms of depersonalization.

Medford N et al. Understanding and treating depersonalization disorder. *Advances in Psychiatric Treatment* 2005; **11**: 92–100.

21.A. Most psychotropic medications undergo hepatic metabolism. Notable exceptions are amisulpride, paliperidone, lithium, acamprosate, and gabapentin. These medications are largely renally excreted without much hepatic degradation. Hence in patients with hepatic failure, the antipsychotic of choice from the given list is amisulpride. Note that certain benzodiazepines, such as oxazepam, undergo glucuronide conjugation (phase 2 metabolism) reaction but no oxidation (phase 1 metabolism) in the liver. Oxazepam can be used in treating alcohol withdrawal in a patient with significantly low hepatic reserve.

Taylor D et al., eds. *The Maudsley Prescribing Guidelines*, 9th edn. Informa Healthcare, 2007, p. 404.

22. D. St John's wort has been shown to be an effective antidepressant in mild to moderate cases. It increases photosensitivity of skin but other adverse effects are limited. It is thought to act by inhibiting reuptake of multiple monoamines, including serotonin, norepinephrine, and dopamine. It also inhibits GABA and glutamate reuptake but the effects of these are unknown. It is a potent inducer of hepatic CYP450 enzymes, leading to a fall in plasma levels of carbamazepine, oral contraceptives, and warfarin if coprescribed.

Taylor D et al., eds. *The Maudsley Prescribing Guidelines*, 9th edn. Informa Healthcare, 2007, p. 244.

23. D. Opioid receptor antagonists are tested as adjuncts for the treatment of alcohol dependence. They can reduce alcohol craving and alcohol consumption. If naltrexone is used in maintaining abstinence, the number of relapses is reduced and the severity of relapses, if they occur, is considerably less. Naloxone is a parenterally administered opioid antagonist, used to reverse the effects of exogenously administered opioids. Acamprosate, bupropion, and disulfiram do not act via an opioid mechanism.

Taylor D et al., eds. *The Maudsley Prescribing Guidelines*, 9th edn. Informa Healthcare, 2007, p. 332.

24. C. Aspirin (and sulindac, to some extent) has comparatively lesser potential to interact with lithium compared to most other NSAIDs. NSAIDs can reduce renal lithium clearance via their effects on fluid balance. This can lead to renal toxicity if the coadministration is sufficiently long. Indometacin is suspected to be worse compared to other NSAIDs in this regard, though careful monitoring of lithium levels is warranted even with use of COX-2 inhibitors such as rofecoxib. Lithium excretion is decreased by medications such as thiazides, angiotensin-converting enzyme inhibitors, and, to a lesser extent, furosemide (furosemide). Lithium clearance is increased by other medications with diuretic effects such as acetazolamide, mannitol, and caffeine.

Reimann IW, Diener U, and Frölich JC. *Indomethacin but not aspirin increases plasma lithium ion levels*. *Archives of General Psychiatry* 1983; **40**: 283–286.

25. B. Stimulants such as methylphenidate are more effective in treating hyperactivity than inattention due to ADHD. Methylphenidate is available in two forms—immediate release and sustained release forms. The immediate release form starts to act within 20 to 60 minutes after administration and acts for up to 2 to 4 hours, while the sustained release form acts up to 12 hours, obviating the need for divided doses.

Taylor D et al., eds. *The Maudsley Prescribing Guidelines*, 9th edn. Informa Healthcare, 2007, p. 281.

26. A. Atomoxetine is the first non-stimulant drug to be approved for ADHD. It has a tricyclic-like structure; it is classified as a phenylpropanolamine derivative. It acts through selective inhibition of the presynaptic norepinephrine transporter. It has a half-life of approximately 5 hours and is metabolized through the CYP2D6 pathway. Drugs such as fluoxetine, paroxetine or bupropion are CYP2D6 inhibitors and may raise atomoxetine levels. Atomoxetine is used for patients who find stimulants too activating or who experience other intolerable side-effects. Atomoxetine has been associated with cases of severe liver injury in a few patients. It must be avoided in patients taking MAOI.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1103.

27. D. Naloxone is an opioid antagonist. It can precipitate acute withdrawal when administered to patients who are actively taking opioid drugs. Symptoms of acute opioid withdrawal include a strong urge to seek the drug, feeling of temperature change, pain, and abdominal distress. Patient may also have confusion, drowsiness, vomiting, and diarrhoea. When opioid antagonists that act for a long duration, such as naltrexone, are prescribed to encourage abstinence and maintain remission in opioid users it is absolutely essential that the use of street drugs has been completely stopped for at least a period of 5 to 7 days. If not, acute withdrawal symptoms will be precipitated. Naloxone produces opioid antagonism that lasts less than 1 hour, whereas naltrexone-induced withdrawal can persist for more than 24 hours.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1076.

28. C. Naloxone produces opioid antagonism that lasts less than 1 hour, as its plasma half-life is between 1 and 2 hours. In opioid overdose, naloxone is administered intravenously and repeated at 2- to 3-minute intervals until the desired response is achieved. In order to maintain recovery in significant overdoses, it is often necessary to continue naloxone by infusion or repeated administration. As this has not happened in the patient described in this question, signs of intoxication have returned.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1339.

29. E. Naloxone is commonly administered via intravenous injections in the UK. It can also be administered intramuscularly or via subcutaneous injections.

Wanger K, Brough L, Macmillan I et al. Intravenous vs. subcutaneous naloxone for out-of-hospital management of presumed opioid overdose. *Academic Emergency Medicine* 1998; **5**: 293–299.

30.A. Lofexidine is an analogue of clonidine, and licensed only in the UK for use in opiate detoxification. It is an α_2 adrenoceptor agonist, similar to clonidine but it causes significantly less hypotension. Action of lofexidine peaks at 3 hours and its elimination half-life is 12–15 hours. It is administered in divided doses to achieve the desired peak effect coincidental with the peak of withdrawal effects. It is used for 1 to 3 weeks in opiate detoxification, with or without substituting a tapering dose of prescribed opiates. α_2 agonism leads to increased autoreceptor activity and resultant reduction in sympathetic stimulation, which mediates the withdrawal symptoms when administration of opioids is suddenly stopped.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1340.

31. C. SSRIs, especially fluoxetine, inhibit CYP2D6 enzyme involved in the metabolism of clozapine. This results in an increase in clozapine levels, leading to additional therapeutic advantage. This combination strategy has been tried in patients whose psychotic symptoms are refractory to clozapine. Therapeutic use of this interaction should be considered only when compliance is assured, maximal dosing has been achieved, and despite this the serum level is below 350 ng/ml. It should be attempted cautiously and with regular monitoring of plasma levels. When adding an SSRI, the dose of clozapine should be reduced in anticipation of the likely rise in plasma concentrations—an approximately twofold dose reduction is suggested for fluoxetine and paroxetine.

Williams L, Newton G, Roberts K et al. Clozapine-resistant schizophrenia: a positive approach. *British Journal of Psychiatry* 2002; **181**: 184–187.

32. D. Moclobemide acts on the same MAO-A enzyme that metabolizes tyramine, but the effect of moclobemide on this enzyme is reversible, leading to a lesser propensity of moclobemide to cause the tyramine reaction. When an unusually large consumption of tyramine-containing products occurs, moclobemide can produce the cheese reaction similar to other MAO inhibitors. Due to the reversible and partly competitive nature of MAO-A blockade by moclobemide, normal activity of existing MAO-A returns within 16 to 48 hours of the last dose of moclobemide. Therefore, the dietary restrictions are less stringent, reducing the avoidance of foods with a high concentrations of tyramine to a period from 1 hour before to 2 hours after taking moclobemide. These foods must be avoided only for 3 days after the last dose of moclobemide, unlike other MAO inhibitors where several days of diet is needed even after withdrawing the medication.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1068.

33. D. Buprenorphine is a partial μ -opioid agonist. It has a slow onset of action and dissociates rather slowly from the μ -receptor. It has very poor oral bioavailability and so is administered sublingually. The half-life of buprenorphine is only 3 to 5 hours but its action is rather prolonged due to slow dissociation of the drug molecule from the receptor—this phase lasts for more than 24 hours. Due to its partial agonistic action, the propensity to cause respiratory depression is lower than that of heroin. When overdose occurs, naloxone must be given at a higher dose and in continuous infusion to reverse the toxicity.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1338.

34.A. Clonidine is a central α_2 agonist. As the α_2 receptor is an autoreceptor, which on stimulation reduces sympathetic output, clonidine acts as sympatholytic drug. It is useful in some patients with tics and in Tourette's syndrome. As many drug withdrawal states are mediated by sympathetic overdrive, clonidine can potentially be used in opioid, alcohol, or benzodiazepine withdrawal though this is not a licensed indication. In children with ADHD, clonidine can be used as a third-line agent after stimulants and atomoxetine. However, it is rarely used for pure ADHD symptoms; it is commonly used when ADHD is accompanied by motor tics. Clonidine can cause significant hypotension.

Tourette's Syndrome Study Group. Treatment of ADHD in children with tics. A randomized controlled trial. *Neurology* 2002; **58**: 527–536.

35.A. Sexual arousal in a man results in the release of nitric oxide (NO) in vascular endothelium, mediated by autonomic nervous signals. NO acts as a second messenger and stimulates the synthesis of cyclic guanosine monophosphate (cGMP). This initiates a chain reaction, which results in corpus cavernosal relaxation and an increase in blood flow into the penis. This is followed by erection. Once produced, cGMP is cleared by the action of an intracellular enzyme called phosphodiesterase-5 (PDE-5). When PDE-5 is inhibited, the concentration of cGMP increases intracellularly, leading to prolonged tumescence and turgidity of the penis. Hence sexual arousal is required for PDE-5 inhibitors to have an effect on performance. Sildenafil acts as a PDE-5 inhibitor, allowing an increase in cGMP and enhancing the vasodilatory effects of NO. Hence it is sometimes referred to as an NO enhancer, but it does not have a direct effect on NO synthesis.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1078.

36.E. Buspirone is an azapirone which, by partial agonistic action on the 5-HT_{1A} receptor, suppresses activity in presynaptic serotonergic neurones. This in turn reduces the serotonin activity, leading to down-regulation of various 5-HT receptors. This is related to anxiolytic activity but with no hypnotic effect. Though buspirone is equieffective to diazepam, patients taking buspirone improve more slowly. This is related to the inherent mode of action, which depends on receptor down-regulation rather than producing a direct receptor action. Patients who are switched from benzodiazepines to buspirone do not do as well as those without previous exposure to benzodiazepines.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1289.

37.A. Amiloride is useful in some cases of lithium-induced polyuria. Polyuria is the most common adverse effect of lithium, occurring in 25% of patients. This polyuria is related to the antagonistic effects of lithium on antidiuretic hormone, leading to diuresis. Conservative management includes fluid replacement, decreasing the dosage of lithium, and single daily dosing of lithium. Potassium-sparing diuretics, such as triamterene and amiloride, or thiazide diuretics are also useful. Unlike thiazides and furosemide, amiloride does not reduce lithium clearance; instead it may increase lithium excretion.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1059.

38.A. Akathisia is the commonest movement disorder associated with antipsychotic prescription. It is more commonly acute, with onset within 48 to 96 hours of administration of the antipsychotics. It is unclear whether akathisia results from dopamine antagonism or dysfunction of other neurotransmitters such as serotonin, acetyl choline, and norepinephrine. Akathisia is often mistaken for anxiety or worsening of psychotic agitation. Akathisia can vary in severity over time, making assessment difficult. Akathisia is associated with suicidality, absconson, aggression, and non-compliance. Tardive dyskinesia develops late in the course of antipsychotic treatment and as such is not associated with absconson from in-patient units, as more often than not the patients do not recognize having troublesome movement disorders. Neuroleptic malignant syndrome and laryngeal dystonia are life-threatening syndromes, often requiring immediate medical attention.

Hansen L. A critical review of akathisia—and its possible association with suicidal behaviour. *Human Psychopharmacology* 2001; **16**: 495–505.

39.A. D2 occupancy in typical antipsychotics correlates with their antipsychotic efficacy and propensity to cause extrapyramidal side-effects. This was demonstrated in a landmark positron emission tomography (PET) study by Kapur et al., where haloperidol produced therapeutic effect at around 65% occupancy; extrapyramidal side-effects occurred when the occupancy was around 78%. For atypicals, both 5-HT_{2A} blockade and D2 occupancy are correlated with clinical efficacy. Clozapine and quetiapine occupy less than half of D2 receptors but still are efficacious as antipsychotics.

Jones MM and Pilowsky LS. Dopamine and antipsychotic drug action revisited. *British Journal of Psychiatry* 2002; **181**: 271.

40.A. Memantine has moderate affinity for the NMDA receptor and acts as a voltage-dependent and non-competitive antagonist. Calcium-mediated excitotoxicity could be due to overstimulation of NMDA receptors by glutamate. Memantine may protect cells against excess glutamate by partially blocking NMDA receptors associated with abnormal transmission of glutamate, while physiological transmission remains unaffected.

Johnstone E et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 303.

41.A. Therapeutic index is a measure that relates the dose of a drug required to produce a desired effect to that which produces an undesired effect. In animal studies, the therapeutic index is usually defined as the ratio of the median toxic dose to the median effective dose for some therapeutically relevant effect. The therapeutic index of a drug in humans cannot be measured directly and the value itself does not have much clinical use; instead, drug trials often reveal a range of usually effective doses and a range of possibly toxic doses, from which a safe therapeutic range is determined, for example 1.0 to 1.2 for lithium which when exceeded results in toxic effects.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004, p. 2685.

42.A. Clozapine has a hit-and-run profile at D2 receptors. The occupancy is around 40% and the time course of occupancy is comparatively shorter than typical antipsychotics. Quetiapine has a similar mode of action to that of clozapine. Clozapine and quetiapine bind more loosely to D2 receptors than dopamine itself whereas haloperidol and risperidone bind to these receptors more tightly. It is suggested that antipsychotics with low binding affinity and fast dissociation rates, such as clozapine and quetiapine, are more responsive to endogenous changes in dopamine than those that bind more tightly and dissociate from the receptor more slowly. This is because baseline dopamine levels are interspersed with task- or stress-induced, several-fold increases in dopamine from normal physiological level.

Pani L, Pira L, and Marchese G. Antipsychotic efficacy: Relationship to optimal D2-receptor occupancy. *European Psychiatry* 2007; **22**: 267–275.

43.D. Volume of distribution is a measure of the apparent space in the body available to contain an administered drug. It can be calculated as a ratio of the administered dose (intravenous) and plasma (or blood) concentration at time = 0, that is when administration occurred. Hence, the higher the plasma concentration, the lower the volume of distribution and vice versa. Volume of distribution can vastly exceed any physical volume in the body because it is an apparent, not an actual, volume necessary to contain a drug homogeneously at the concentration found in the plasma. Drugs with very high volumes of distribution have higher concentrations in extravascular tissue than in the vascular compartment, while those that are contained fully in the vascular compartment have a smaller volume of distribution limited by the volume of plasma component. The apparent volume of distribution depends on properties of the drug molecule, such as lipid solubility and protein binding. Tissue binding decreases the plasma concentration and makes the apparent volume larger. Plasma protein binding increases plasma concentration and makes the apparent volume smaller. Half-life is a secondary measurement calculated from the volume of distribution and clearance rates, but volume of distribution itself does not depend on half-life of a drug. If the rate of clearance is slower or the volume of distribution is more extensive, the half-life will be longer.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004, p. 2702.

44.B. The cytochrome P450 (CYP450) enzyme system is responsible for much of the phase 1 metabolism of drugs. Phase 1 metabolism includes oxidation, reduction, and hydrolysis, as a result of which a molecule (active or inactive) suitable for conjugation is produced. The phase 2 metabolism involves conjugation reactions such as glucuronidation, as a result of which polar compounds (mostly inactive), which are excreted in bile or urine, are formed. Induction and inhibition of the activity of the CYP450 system can result in various potential drug interactions. The most important enzymes in the CYP family involved in the metabolism of psychotropic drugs are CYP1A2, CYP2C9, CYP2C19, CYP2D6, and CYP3A4. CYP3A4 is responsible for the metabolism of more than 90% of psychotropic drugs that undergo hepatic biotransformation. In this question, if the CYP system is induced then the metabolic breakdown of drug A will be increased, producing more inactive metabolites. This will reduce the efficacy of drug A.

Chadwick B, Waller DG, and Edwards JG et al. Potentially hazardous drug interactions with psychotropics. *Advances in Psychiatric Treatment* 2005; **11**: 440–449.

45.A. Conjugation refers to phase 2 metabolism of administered drugs. These take place after oxidation-type reactions in phase 1. Enzymes such as transferases carry out conjugation, which usually results in inactive metabolites (or, rarely, active compounds, e.g. morphine). It is not essential that a drug must undergo phase 1 metabolism in order to undergo phase 2 metabolism, for example oxazepam undergoes direct phase 2 reactions.

Cookson J et al., eds. *Use of Drugs in Psychiatry: The Evidence from Psychopharmacology*, 5th edn. Gaskell, 2002, p. 57.

46.C. Oxidation is not a phase 2 reaction—it is a phase 1 reaction. Various types of phase 2 reactions include glucuronidation, acetylation, sulfation, and glutathione conjugation. Hydrolysis and hydroxylation are considered to be other phase 1 reactions.

Cookson J et al., eds. *Use of Drugs in Psychiatry: The Evidence from Psychopharmacology*, 5th edn. Gaskell, 2002, p. 57.

47.B. Most prescribed drugs transfer into breast milk except very large molecules such as heparin and insulin, but the amount transferred is negligible for most drugs. The mechanism of transfer is passive diffusion through the lipid cell membrane of the lactating glands. Factors such as low plasma protein binding and high lipid solubility aid a drug in reaching high concentrations in breast milk. As milk is slightly more acidic than plasma, weakly basic drugs transfer more readily into breast milk, become ionized in the acid medium, and so get 'trapped'. Unionized molecules cross biological membranes more easily than charged particles (ions). If a breastfeeding mother must take psychotropics and the drug is a relatively safe one, it is recommended that the drug is taken 30–60 minutes after nursing and 3–4 hours before the next feed, if possible.

Cohen D. Psychotropic medication and breast feeding. *Advances in Psychiatric Treatment* 2005; **11**: 371–379.

48.C. Zolpidem is a non-benzodiazepine hypnotic of the imidazopyridine class. It is rapidly absorbed and has a short elimination half-life (mean 2.5 hours). It decreases sleep-onset latency, reduces disruptive midnight awakenings but has less consistent effects on total sleep time. It does not affect the REM distribution and unlike benzodiazepines, which increase stage 2 NREM at the expense of deep sleep NREM, zolpidem does not increase stage 2. It is unclear if zolpidem produces clinically significant rebound as yet but dependence is thought to be low compared to other hypnotics.

Darcourt G, Pringuey D, Sallière D, and Lavoisy J. The safety and tolerability of zolpidem—an update. *Journal of Psychopharmacology* 1999; **13**: 81–93.

49.E. Two types of monoamine oxidase have been recognized: monoamine oxidase A predominantly metabolizes norepinephrine and serotonin; monoamine oxidase B predominantly metabolizes dopamine. Selegiline is a selective inhibitor of monoamine oxidase B that retards the breakdown of dopamine and so it prolongs the antiparkinsonism effect of levodopa as an adjunctive therapy for patients with fluctuating response to levodopa. Some studies have found it to be effective for treating depression but only at very high doses at which selective MAO-B inhibition effect is taken over by non-specific inhibition.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1070.

50. C. Citalopram (and escitalopram) is the most selective inhibitor of serotonin reuptake, with negligible effects on the reuptake of other monoamines such as norepinephrine or dopamine. It does not have any clinically significant effect on histaminergic, GABAergic, or acetylcholinergic transmission. Paroxetine has clinically significant anticholinergic activity. Fluoxetine weakly inhibits norepinephrine reuptake and binds to 5-HT_{2C} receptors. Sertraline weakly inhibits both norepinephrine and dopamine reuptake, without any additional clinical advantage.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1085.

51. C. Prolongation of the QT interval of the ECG is associated with the development of torsade de pointes, a ventricular arrhythmia that can cause syncope and may progress to ventricular fibrillation and sudden death. The average QTc interval is approximately 400 ms. A QTc interval of 500 ms or greater is considered to be a high risk factor for torsades de pointes, though the prediction of arrhythmia is not simply linearly dependent on QT measure. An elevated risk of serious adverse cardiac events or sudden cardiac death has been documented for thioridazine, clozapine, droperidol, pimozide, and sertindole. These are considered higher-risk antipsychotics in terms of serious cardiac effects. Haloperidol, quetiapine, risperidone, chlorpromazine, and trifluoperazine have a tendency to extend the QT interval even at therapeutic doses, but their link with sudden cardiac death is not yet clarified. Amisulpride, aripiprazole, olanzapine, sulpiride, and zotepine have not been linked with an elevated risk of sudden cardiac death or QTc prolongation. Typical neuroleptics that have lower potency, such as thioridazine and chlorpromazine, are more cardiotoxic than high-potency drugs such as haloperidol. The major effects on the electrocardiogram include prolongation of the QT and PR intervals, T wave blunting or inversion, and ST segment depression. Sudden death noted in antipsychotic recipients may also be due to seizures during sleep, sudden asphyxiation, temperature dysregulation (for example malignant hyperthermia), and neuroleptic malignant syndrome.

Abdelmawla N and Mitchell AJ. Sudden cardiac death and antipsychotics. Part 2: Monitoring and prevention. *Advances in Psychiatric Treatment* 2006; **12**: 100–109.

52. B. Drugs can undergo two different types of clearance when administered. When a constant fraction of a drug is cleared per unit time, it is called first-order kinetics. This means that when the amount of drug in plasma or dose of administered drug increases, the clearance proportionately increases as a stable fraction of plasma concentration. When the system facilitating such clearance of drugs becomes saturated, drugs follow zero-order kinetics. Here a constant amount, not a fraction, of the drug is cleared per unit time. This means that irrespective of the amount of drug in plasma or dose of drug administered, only a fixed unit of drug is cleared by the body. Thus, increasing the dose might result in serious toxicity in this case. Certain drugs have a propensity to undergo zero-order kinetics, even at therapeutic dose levels. Phenytoin metabolism is dose dependent, wherein smaller therapeutic doses follow first-order kinetics while higher doses follow zero-order kinetics. Gabapentin is not metabolized by liver and undergoes first-order renal clearance. Valproate follows first-order kinetics even in wide therapeutic dose levels. Lamotrigine, too, shows first-order linear kinetics and it is metabolized predominantly through glucuronidation.

Splinter MY. Pharmacokinetic properties of new antiepileptic drugs. *Journal of Pharmacy Practice* 2005; **18**: 444–460.

53.E. The small intestine has the largest surface area for drug absorption in the GI tract, and its membranes are more permeable than oral epithelium, oesophagus, or stomach. Hence most drugs are absorbed primarily in the small intestine. Gut mucosa harbours many metabolic enzymes that can breakdown active drug molecules and reduce the bioavailability of administered drugs.

Atkinson A et al., eds. *Principles of Clinical Pharmacology*, 2nd edn. Elsevier, 2007, p. 39.

54.D. The abrupt discontinuance of SSRI use is associated with a discontinuation syndrome. This is characterized by fatigue, light headedness, nausea, headache, anxiety, insomnia and poor concentration, flu like symptoms, and electric shock-like paresthesias. In most cases, at least 6 weeks of treatment have elapsed before a discontinuation reaction takes place. The symptoms are self-resolving within 3 weeks in most cases. It is suggested that those who tolerate SSRIs poorly on initiation are more likely to develop discontinuation symptoms. Fluoxetine is the SSRI least likely to be associated with this syndrome, because it has a metabolite that is active with a half-life of more than a week. Shorter half-life medications, such as paroxetine, are associated with more discontinuation symptoms. Other classes of antidepressants, such as venlafaxine and tricyclics, are also associated with discontinuation reactions.

Taylor D et al., eds. *The Maudsley Prescribing Guidelines*, 9th edn. Informa Healthcare, 2007, p. 240.

55.A. Paroxetine has a half-life of nearly 21 hours, which is short compared to fluoxetine, which has a prolonged duration of action due to an active metabolite that remains in the body for many days. In addition, paroxetine is more anticholinergic than most other SSRIs. Too rapid a discontinuation of any drug with significant anticholinergic properties may lead to a cholinergic rebound. The symptoms are characterized by acetylcholine excess—nausea, vomiting sweating, stomach cramps, diarrhoea, anxiety, agitation, and insomnia. In some cases delirium can result. This rebound is more common with tricyclics than SSRIs, except in the case of paroxetine which has significant anticholinergic effects.

Taylor D et al., eds. *The Maudsley Prescribing Guidelines*, 9th edn. Informa Healthcare, 2007, p. 241.

56.A. Dosulepin or dothiepin together with amitriptyline has been associated with most cases of fatal tricyclic antidepressant overdose. The ingestion of large quantities of tricyclics in overdose results in complex changes in the normal pharmacokinetics observed at therapeutic doses. Due to anticholinergic effects, gastric emptying is delayed and a sustained slow absorption takes place. Respiratory depression produces acidosis, which reduces protein binding and increases the active free fraction of the toxic drug. The toxic effects of tricyclics are due mainly to an increased sympathetic drive, adrenergic blockade, arrhythmogenic effect on myocardium, and anticholinergic action.

Kerr GW, McGuffie AC, and Wilkie S. Tricyclic antidepressant overdose: a review. *Emergency Medicine Journal* 2001; **18**: 236–241.

57.A. Many treatment variables are associated as risk factors for neuroleptic malignant syndrome (NMS). Nearly all dopamine antagonists have been associated with NMS, although high-potency conventional antipsychotics are associated with a greater risk compared with low-potency agents and atypical antipsychotics. Intramuscular administration, rapid tranquilization, and faster titration rates are associated with higher incidence. Drugs with an intrinsic anticholinergic property have a lower propensity to cause NMS. Atypical agents produce atypical NMS, where the classic rigidity or hyperthermia component of NMS may be conspicuously absent. The risk of NMS is not related to α adrenergic blockade or sedative property of an antipsychotic drug.

Stübner S, Rustenbeck E, Grohmann R et al. Severe and uncommon involuntary movement disorders due to psychotropic drugs. *Pharmacopsychiatry* 2004; **37** (Suppl. 1): S54–S64.

58. B. Benzodiazepine withdrawal symptoms include anxiety, inner tension, dizziness, insomnia, and anorexia. More severe withdrawal symptoms include nausea and vomiting, severe tremor, muscle weakness, postural hypotension, and tachycardia with psychological symptoms of dysphoria, depressive pessimistic thoughts, and obsessive ruminations. Myoclonus, pain symptoms, ataxia, kinaesthetic hallucinations, depersonalization, and hyperacusis are also noted. The withdrawal symptoms can develop after only 4 weeks of continuous use. Clonazepam, carbamazepine, and long-acting benzodiazepines themselves have been used in the management of withdrawal symptoms.

Taylor D et al., eds. *The Maudsley Prescribing Guidelines*, 9th edn. Informa Healthcare, 2007, p. 264.

59. B. Typical neuroleptics vary in their potential to cause anticholinergic symptoms. As a general rule, high-potency medications such as haloperidol produce less anticholinergic effects compared to low-potency drugs such as chlorpromazine and thioridazine. Peripheral anticholinergic effects include dry mouth, blurred vision, constipation, and urinary retention. Central anticholinergic effects, such as confusion and delirium, are seen especially in overdose of low-potency agents and in the elderly.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1048.

60. D. Severe sweating incongruent to room temperature is associated with TCAs, SSRIs, and venlafaxine. This is a socially disabling side-effect. Drugs such as terazosin, cyproheptadine, benztrapine, and oxybutynin have been tried anecdotally to treat this symptom but none of these has been recommended for routine use. The mechanism by which SSRIs increase sweating is unknown but is hypothesized to be through activation of the sympathetic nervous system or by action on the hypothalamus.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 983.

Marcy R and Britton ML. Antidepressant-induced sweating. *Annals of Pharmacotherapy* 2005; **39**: 748–752.

61.A. The most commonly used anticholinergic drugs for extrapyramidal symptoms in patients taking antipsychotics are trihexyphenidyl (benzhexol), benztrapine, biperiden, and procyclidine. Orphenadrine is an antihistaminergic agent with prominent anticholinergic action. Benztrapine also has some antihistaminergic effects. All these agents are antimuscarinic. Trihexyphenidyl (benzhexol) is the most stimulating of all anticholinergics.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1004.

62. C. Benztrapine is the least stimulating anticholinergic agent and so it is least associated with drug-abuse potential. Benztrapine reaches peak plasma concentrations in 2 to 3 hours after oral administration and acts for 1 to 12 hours. Benztrapine is available as an intramuscular preparation and this is preferred when available in acute dystonia.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1004.

63.A. Trihexyphenidyl is suspected to have some dopaminergic activities which produce stimulating effects. It has a higher abuse potential than other anticholinergic drugs.

Smith JM. Abuse of the antiparkinson drugs: a review of the literature. *Journal of Clinical Psychiatry* 1980; **41**: 351–354.

64. E. Lithium-induced tremor is frequently postural in nature and occurs at 8 to 12 Hz frequency. It is most notable in outstretched hands. If troublesome, the tremor can be reduced by giving lithium in divided doses or using a sustained release formulation wherein peaks and troughs in plasma level are better managed. A reduction in tremors can be noted if the patient's anxiety is better managed and caffeine intake is reduced. β -blockers, such as propranolol, have been used to reduce lithium-induced tremor. If the tremors turn coarse, suspect lithium toxicity. Procyclidine can alleviate extrapyramidal symptoms but it has no effects on lithium-induced tremors.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1059.

65.A. Donepezil is an anticholinesterase drug widely used in patients with a moderate degree of Alzheimer's dementia. It is administered orally once daily. The half-life of donepezil is 70 hours in the elderly and steady-state levels are achieved within about 2 weeks. The half-life of rivastigmine, another antidementia drug, is 1 hour, but it dissociates slowly from cholinesterase enzyme, thus a single dose is therapeutically active for 10 hours. Rivastigmine is taken twice daily. Galantamine is an alkaloid (extracted from daffodils (*Narcissus pseudonarcissus*) and snow drops (*Galanthus nivalis*)); it has an elimination half-life of nearly 6 hours, and so is administered twice daily. A sustained release preparation is now available.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1034.

66. D. Alcohol (ethanol) is metabolized via an oxidation reaction catalysed by alcohol dehydrogenase. This results in formation of acetaldehyde, which is further broken down to acetyl-coenzyme A by aldehyde dehydrogenase. Disulfiram is a non-competitive, irreversible aldehyde dehydrogenase inhibitor. So when alcohol is taken together with disulfiram this leads to accumulation of acetaldehyde. A high level of acetaldehyde is associated with nausea, throbbing headache, vomiting, hypertension, flushing, sweating, thirst, dyspnoea, tachycardia, chest pain, vertigo, and blurred vision. The accumulation of acetaldehyde occurs almost immediately after the ingestion of alcohol in those who take disulfiram; the reaction can last from 30 minutes to 2 hours. The initiation of disulfiram should not take place unless the patient has abstained from alcohol for at least 12 hours. Its half-life is estimated to be 60 to 120 hours. The effect of disulfiram treatment can last as long as 1 or 2 weeks after the last dose of disulfiram. Most fatal reactions occur in persons who are taking more than 500 mg a day of disulfiram and who consume more than 90 g of alcohol.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1039.

Deitrich RA and Erwin VG. Mechanism of the inhibition of aldehyde dehydrogenase in vivo by disulfiram and diethyldithiocarbamate. *Molecular Pharmacology* 1971; **7**: 301–307.

67.A. Cigarette smoking occurs at a very high rate in patients with schizophrenia. Many reasons have been proposed as to why such high rates of smoking are seen in schizophrenia patients. One suggestion is that patients smoke as a form of self-medication with nicotine, which may help to regulate a dysfunctional mesolimbic dopamine system. Nicotine can increase dopamine release in the prefrontal cortex and reduce negative symptoms to some extent. Nicotine could enhance cognitive performance for certain tasks. Antipsychotic medications could block the dopamine reward pathway, necessitating an increase in nicotine concentrations needed to produce reward effects from smoking. Smoking may decrease the plasma levels of typical antipsychotic drugs via induction of the CYP450 enzymes system, providing some relief from extrapyramidal side-effects, but most patients who smoke start smoking even before onset of the illness.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1050.

Kelly C and McCreadie R. Cigarette smoking and schizophrenia. *Advances in Psychiatric Treatment* 2000; **6**: 327–331.

68.B. Acamprosate is a structural analogue of GABA and taurine. Its mechanism of action is thought to be antagonism of glutamatergic N-methyl-D-aspartate (NMDA) receptors. It should only be started after the individual has been successfully weaned off alcohol; this is not because of alcohol–acamprosate interaction but the efficacy of acamprosate is demonstrated only in individuals who have been successfully detoxified from alcohol. The concomitant intake of alcohol and acamprosate does not affect the pharmacokinetics of either alcohol or acamprosate, but if the patient relapses more than once while on acamprosate the treatment must be reconsidered. Administration of disulfiram does not affect the pharmacokinetics of acamprosate; though this is practiced at certain centres, no strong evidence exists to support the combination. Bupropion, used to aid abstinence from smoking, is started 2 weeks before a target date is set to quit smoking.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1039.

69.C. Dantrolene sodium is used to treat rigidity and hyperthermia in patients with neuroleptic malignant syndrome (NMS). Dantrolene binds to a calcium channel called ryanodine receptor in skeletal muscle, leading to a fall in intracellular calcium concentration and reduced contraction. It is usually administered via the intravenous route; it reduces muscle spasm in most patients with neuroleptic malignant syndrome. Dantrolene is not a stand-alone treatment for NMS; it must be accompanied by resuscitation, fluid replacement, and cardiac and respiratory support. Rigidity is relieved usually within minutes to hours of administration. Dantrolene can also be used in other cases of life-threatening muscle rigidity, for example catatonia and serotonin syndrome.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1037.

70.E. Haloperidol is chemically a butyrophenone. Fluphenazine, perphenazine, and trifluperazine are piperazine phenothiazines. Chlorpromazine is an aliphatic phenothiazine while thioridazine is a piperidine phenothiazine. Thiothixene is a thioxanthene antipsychotic; pimozide is a diphenyl butyl piperidine. Loxapine is a dibenzoxapine. Many of these typical antipsychotics are rarely used in current practice.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1047.

71.B. Lamotrigine is an anticonvulsant increasingly being used to prevent recurrent depressive episodes in bipolar disorder. Lamotrigine is thought to act via blockade of voltage-sensitive sodium channels, with secondary effect on calcium transport. Lamotrigine has weak effects on the serotonin system.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1054.

72.B. Lithium produces hypokalaemia-like changes on the electrocardiogram (ECG). This is related to displacement of intracellular potassium by the lithium ion. T-wave flattening or inversion is the commonest ECG change reported. These changes commonly disappear after stopping lithium. Lithium depresses the sinoatrial node; this can lead to sinus dysrhythmia, heart block, and syncope. Hence lithium is contraindicated in persons with sick sinus syndrome. Cardiac effects of lithium are more pronounced in those who have pre-existing cardiac problems, on diuretic treatment, and in those with renal impairment.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1059.

73.A. Lamotrigine is associated with rash, which is benign in about 8% of patients started on lamotrigine within the first 4 months of treatment. In a small but significant proportion of patients (nearly 0.1%) this may be an early manifestation of Stevens–Johnson syndrome or toxic epidermal necrolysis. So lamotrigine must be discontinued whenever a rash is reported during treatment. Unfortunately, this discontinuation is not always sufficient to prevent the life threatening-hypersensitivity reaction, Steven–Johnson syndrome. The chances of developing a rash increases if lamotrigine is started at a higher than recommended dose or titrated at a faster than recommended speed. Coadministration of valproate can also increase the incidence of rash.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1054.

74.A. The electrical stimulus delivered via ECT must be strong enough to reach the seizure threshold of the patient. Each individual has a different seizure threshold with nearly 40-fold variability among patients. During the course of ECT treatment itself, the seizure threshold could increase in the range of 25 to 200%. Older men generally have a higher threshold than the young. Amnesia related to ECT is proportional to the degree to which the administered electricity dose is high in relation to patients' seizure thresholds. Incidence of cognitive disturbance is higher when a patient receives thrice-weekly ECT compared to twice-weekly treatments.

UK ECT Review Group. Efficacy and safety of electroconvulsive therapy in depressive disorders: a systematic review and meta-analysis. *Lancet* 2003; **361**: 799–808.

75.B. Bupropion resembles amphetamine in its structure—it is a monocyclic aminoketone. Bupropion is a norepinephrine and dopamine reuptake inhibitor. Its side-effects profile is different from that of SSRIs in that it causes very low incidence of sexual dysfunction or sedation and produces some weight loss. It does not cause significant discontinuation reactions. It is currently licensed to help people quit smoking, but is not licensed as an antidepressant in the UK. Bupropion is contraindicated in patients with a history of eating disorder; it can cause significant changes in appetite. Bupropion has a high propensity to cause seizures.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 1024.

76.D. In the UK, duloxetine is marketed to treat stress urinary incontinence (SUI) in women under the name Yentreve® (Eli Lilly and Company). The female urethra has a rhabdosphincter of circularly arranged striated muscles. Generally, relaxation of this sphincter allows micturition. The sphincter is innervated by neurones from the sacral spinal cord (S2–S4). Duloxetine blocks the reuptake of serotonin and norepinephrine at this site to stimulate contraction of the rhabdosphincter, leading to an increase in the tone of the urethral sphincter. The increased muscle tone inhibits involuntary urine loss. To treat stress incontinence, a dose of 40 mg twice daily (80 mg/day) is recommended. In depression a dose of 60 mg/day given once daily is often used. Duloxetine can also help neuropathic pain, where a higher dose of up to 120 mg has been used.

Thor KB. Serotonin and norepinephrine involvement in efferent pathways to the urethral rhabdosphincter: implications for treating stress urinary incontinence. *Urology* 2003; **62**: 3–9.

77.C. Lamotrigine is mainly metabolized via glucuronidation and does not have much effect on other prescribed medications, but valproate has been observed to double the plasma levels of lamotrigine. The elimination half-life of lamotrigine in healthy young adults is approximately 25 to 30 hours. In patients taking valproate this is prolonged to 60 hours. As a result, when lamotrigine is initiated for patients who are taking valproate, the starting dose should be approximately 50% of the normal starting dose of lamotrigine. Some suggest that if valproate is started for a patient who is already on lamotrigine, one must consider obtaining a baseline lamotrigine plasma concentration. The lamotrigine dose may have to be reduced during the valproate dose titration. As a result of this interaction, the incidence of lamotrigine-induced rash seems to be more common in those taking the combination. Phenytoin, carbamazepine, and oral contraceptives may reduce the half-life of lamotrigine.

Anderson GD, Yau MK, Gidal BE et al. Bidirectional interaction of valproate and lamotrigine in healthy subjects. *Clinical Pharmacology and Therapeutics* 1996; **60**: 145–156.

78.A. Lithium can aggravate psoriasis. The induction of psoriasis without pre-existing disease is less common than exacerbation of existing disease. Not all patients with pre-existing psoriasis have a flare when starting lithium and psoriasis is not considered to be a contraindication to taking lithium for mania or depression. Similarly, other drugs such as β-blockers, antimalarials, and indometacin can aggravate psoriasis. Psoriasis that has flared with lithium appears to be more resistant to standard treatment modalities. Some preliminary evidence suggests that supplemental inositol or omega-3-fatty acids may improve symptoms in patients with psoriasis during lithium treatment. Histological studies on the skin lesions induced or aggravated by lithium are equivocal; some support the lesions to be consistent with psoriasis, although others have claimed the features as non-specific and refer to as psoriasisiform dermatitis.

Fry L and Baker BS. Triggering psoriasis: the role of infections and medications. *Clinics in Dermatology* 2007; **25**: 606–615.

79. C. Polyuria, one of the most common side-effects of lithium, is related to tubular concentrating defect that is resistant to vasopressin. This results in nephrogenic diabetes insipidus. Vasopressin receptor expression is reduced by lithium, leading to a failure of facilitation of water movement. It is thought that taking lithium in a single dose prevents, or at least limits, renal tubular impairment. The most likely reason for the reduction of thirst and polyuria is the less frequent stimulation of the thirst centre by the lithium salts in once-a-day doses. However, some studies have shown that the beneficial effect of single dosage is seen only in those who received multiple doses for a short time. It is possible that long-term, multiple-dose administration results in irreversible changes in tubular mechanisms. Patient adherence can be improved by a single-dosing schedule of lithium; however, once-a-day schedules have not been shown to be conclusively superior with respect to glomerular damage or renal failure.

Ljubicic D, Letica-Crepulja M, Vitezic D et al. Lithium treatments: single and multiple daily dosing. *Canadian Journal of Psychiatry* 2008; **53**: 323–331.

80. E. On pharmacokinetic grounds, oxazepam may be preferable to chlordiazepoxide in cirrhotic patients since the elimination of oxazepam is not greatly altered in cirrhosis. In general, longer-acting benzodiazepines, such as chlordiazepoxide or diazepam, are preferred as they produce a smoother withdrawal course with less breakthrough or rebound symptoms, but they may lead to excess sedation for patients with hepatic dysfunction/cirrhosis. Shorter-acting benzodiazepines, such as oxazepam, may result in greater discomfort and more discharges against medical advice, because alcohol withdrawal symptoms tend to recur when the plasma drug levels drop. Shorter-acting agents, such as lorazepam or oxazepam, require more frequent dosing. They may be more useful for symptom-triggered regimens than fixed-dose regimens of alcohol detoxification.

Taylor D et al., eds. *The Maudsley Prescribing Guidelines*, 9th edn. Informa Healthcare, 2007, p. 237.

81. D. Anticholinergic drugs may exacerbate some symptoms of tardive dyskinesia (TD). Traditionally, long-term anticholinergic prescriptions are thought to promote the onset of TD, though the evidence in support of this notion is minimal. Tardive dyskinesia is a troublesome side-effect of antipsychotics. It is more common in older patients and those with neurological diseases. The risk of tardive dyskinesia is estimated as 3–5% per year of exposure (at least for the first 5 years) with conventional antipsychotics. The appearance of symptoms usually takes more than 3 months, the risk increasing proportionally with duration of treatment. In elderly patients this increases to be as high as 25% within the first year of exposure to typical antipsychotics. Women, children, and patients with primary mood disorders or learning disabilities are also at higher risk. Some studies report an increased risk associated with diabetes and comorbid substance use.

Tasman A, Maj M et al., eds. *Psychiatry*, 3rd edn. John Wiley and Sons, 2008, p. 1783.

82. B. Serotonin is released from platelets in response to vascular injury. It promotes vasoconstriction and platelet aggregation. Platelets do not possess the synthetic machinery to produce serotonin and so depend on uptake via 5-HT transporters on their membrane. SSRIs inhibit the serotonin transporter, leading to a hyposerotonergic state in platelets. This reduces the ability to form clots, with subsequent increase in the risk of bleeding. Thus, SSRIs cause a functional impairment of platelet aggregation (thrombasthenia), but not a reduction in platelet number. This can cause easy bruising or prolonged bleeding in those with gastric ulcers or bleeding diathesis. Some authors recommend gastroprotection when SSRIs are coadministered with NSAIDs.

Paton C and Ferrier IN. SSRIs and gastrointestinal bleeding. *BMJ* 2005; **331**: 529–530.

83.A. Varenicline is a partial agonist at the $\alpha_4\beta_2$ unit of the nicotinic acetylcholine receptor. It is shown to assist smoking cessation by relieving nicotine withdrawal symptoms and reducing the rewarding properties of nicotine. It is advised to choose a quitting date and start taking the tablets 1 week before the date. Generally, varenicline is started at 0.5 mg daily, increasing to 0.5 mg twice daily after 3 days. The final dose is 1 mg twice daily for up to 12 weeks.

Jorenby DE, Hays JT, Rigotti NA et al. Efficacy of varenicline, an $\alpha_4\beta_2$ nicotinic acetylcholine receptor partial agonist, vs placebo or sustained-release bupropion for smoking cessation: a randomized controlled trial. *JAMA* 2006; **296**: 56–63.

84.E. All of the listed drugs except α_1 -blockers are associated with erectile dysfunction. Parasympathetic activity during arousal triggers the release of nitric oxide, which increases the levels of the intracellular cyclic guanosine monophosphate (cGMP). Increases in cGMP cause penile vascular and trabecular smooth muscle relaxation, leading to increase in blood flow. The rapid filling of the cavernosal spaces compresses venules leading to reduction in venous outflow. This process effectively raises intracavernosal pressure, resulting in erection. α_1 adrenergic blockers can enhance erectile function by reducing the sympathetic tone and relaxing trabecular smooth muscle cells. Nearly 25% of cases of erectile dysfunction are related to medication side-effects. Many prescribed drugs, including β -blockers, H_2 antagonists, diuretics, antiepileptics, antidepressants, and antiparkinsonian medications, can cause erectile dysfunction. In addition, street drugs such as cannabis, cocaine, alcohol, ecstasy, and opiates can also lead to impotence.

Tasman A, Maj M et al., eds. *Psychiatry*, 3rd edn. John Wiley and Sons, 2008, p. 1588.

85.B. The vasodilatation required to bring on erection is mediated by nitric oxide (NO). Nitric oxide enables vascular smooth muscle relaxation via production of a second messenger, called cGMP. Men suffering from erectile dysfunction (ED) may have successful erection if the availability of cGMP is prolonged or increased. This can be achieved by modulating an enzyme called phosphodiesterase (PDE-5). Normally PDE-5 terminates the action of cGMP by converting it into inactive form (GMP). By inhibiting PDE-5, sildenafil lengthens the life of cGMP and helps to achieve erection.

There are nine different types of PDE found in different tissues of the body; for example coronary tissues have the PDE-3 type receptors; PDE-5 receptors are found in platelets and various muscle tissues; and PDE-6 receptors are found in the retina. Sildenafil has some propensity to act on PDE-6, apart from its primary action on PDE-5; this explains defects in colour vision experienced by some patients taking sildenafil. As sildenafil does not produce new cGMP directly, it cannot act as an aphrodisiac. Hence it cannot help patients with reduced arousal due to other causes such as depression.

Francis SH and Corbin JD. Sildenafil: efficacy, safety, tolerability and mechanism of action in treating erectile dysfunction. *Expert Opinion on Drug Metabolism and Toxicology* 2005; **1**: 283–293.

86. D. Naloxone is an opioid antagonist and has no analgesic activities. Naltrexone is a longer-acting opioid antagonist with no clinically useful analgesic actions. Nomifensine is not an opioid; it is a cyclic antidepressant with norepinephrine and dopamine reuptake inhibition. It was withdrawn from the clinical market due to hepatotoxicity and renal damage, in addition to fears regarding abuse potential. Propoxyphene has mild to moderate analgesic properties but its metabolite, norpropoxyphene, is devoid of clinically useful analgesia. Codeine, on the other hand, is a strong analgesic and breaks down to morphine which has potent analgesic activity. Codeine is ineffective as an analgesic at usual doses in 7 to 10% of the white population with low activity CYP2D6 alleles. It is reported that in those with ultrarapid CYP2D6 metabolism, codeine intake may result in an increase in morphine production, occasionally resulting in opioid intoxication.

Yue QY, Alm C, Svensson JO, and Sawe J. Quantification of the O- and N-demethylated and the glucuronidated metabolites of codeine relative to the debrisoquine metabolic ratio in urine in ultrarapid, rapid, and poor debrisoquine hydroxylators. *Therapeutic Drug Monitoring* 1997; **19**: 539–542.

87. C. There are three important types of opioid receptors; most analgesic effects are associated with μ receptors. The δ and κ receptors also contribute to the analgesic effect to some extent. Morphine and codeine mainly act via μ receptors to produce clinical analgesia. Opioids are coupled to Gi proteins that decrease cAMP. When opioids bind to μ receptors, hyperpolarization of the nociceptive neurone (sensory neurone for pain) takes place via opening of K^+ channels and inhibition of the Ca^{2+} channels. This reduces neuronal activity and reduces the transmission of pain signals via ascending pathways to the brain.

Stein C, Schäfer M, and Machelska H. Attacking pain at its source: new perspectives on opioids. *Nature Medicine* 2003; **9**: 1003–1008.

88. B. Methylxanthines include caffeine and theophylline. They have CNS stimulatory properties. At therapeutic doses, these drugs block adenosine receptors; at higher concentrations inhibition of the phosphodiesterase enzyme takes place. Adenosine is released from neurones and glia. It acts via G-protein-coupled receptors (A_1 , A_{2A} , A_{2B} , and A_3). A_1 receptors have inhibitory role while A_2 receptors have stimulatory properties. A_1 receptor antagonism may enhance cognition and facilitate arousal. At higher doses where inhibition of phosphodiesterase occurs, intracellular levels of cAMP increase.

Abbracchio MP and Cattabeni F. Brain adenosine receptors as targets for therapeutic intervention in neurodegenerative diseases. *Annals of the New York Academy of Science* 1999; **890**: 79–92.

89. C. Livedo reticularis refers to a characteristic purple mottling of the skin seen in patients taking amantadine. It is usually seen as a lacy, net-like pattern of vascular change on the legs. It is also associated with vasculitis such as lupus. Mostly, the livedo reticularis disappears when the drug is discontinued, usually within several weeks. The appearance of livedo does not always warrant the cessation of the drug. The common side-effects of levodopa include insomnia, postural hypotension, gastrointestinal disturbances, tremors, mood changes, and fatigue. Bromocriptine can cause postural hypotension, nausea, oedema, confusion, dry mouth, and depression. Tolcapone is a COMT inhibitor and can cause abdominal pain, back pain, constipation, nausea, diarrhoea, and liver failure.

Sladden MJ, Nicolaou N, Johnston GA et al. Livedo reticularis induced by amantadine. *British Journal of Dermatology* 2003; **149**: 656–658.

90. D. Tiagabine is an add-on antiepileptic drug developed by modifying a GABA uptake inhibitor called nipeptic acid. Tiagabine is a potent inhibitor of GABA uptake into both neurones and glial cells. It acts via selective inhibition of the GABA transporter, GAT-1. Through this mechanism, tiagabine enhances GABA_A receptor-mediated tonic inhibition. Vigabatrin is a selective and irreversible GABA-transaminase inhibitor. Topiramate produces its antiepileptic effect through several mechanisms such as modification of Na⁺-dependent and/or Ca²⁺-dependent action potentials, enhancement of GABA-mediated Cl⁻ fluxes into neurones, and inhibition of kainate-mediated conductance at AMPA glutamate receptors. Gabapentin is a structural analogue of GABA and though originally designed as a GABA-mimetic, its mechanism of action is still unknown.

Perucca E. Clinical pharmacology and therapeutic use of the new antiepileptic drugs. *Fundamental and Clinical Pharmacology* 2001; **15**: 405–417.

91. A. Melatonin has not been demonstrated to have clinically significant antidepressant properties. Ropinirole is a dopamine agonist; it acts via the stimulation of postsynaptic dopamine D₂-type receptors within the basal ganglia. Agomelatine is a novel agent promoted as a melatonergic antidepressant; its main antidepressant effect is mediated via 5-HT_{2C} antagonism, which may modulate noradrenergic and dopaminergic neurotransmission. L-tryptophan is a serotonin precursor and is not considered as melatonergic drug. Modafinil is not used as an antidepressant; it acts via an influence on dopamine-dependent adrenergic signalling, though the exact mechanism is still unclear.

Palaniyappan L and McAllister-Williams RH. Antidepressants: will new mechanisms of action improve poor outcomes? *British Journal of Hospital Medicine (Lond)* 2008; **69**: 88–90.

92. D. Buprenorphine and naloxone act via opioid receptors; they are not indicated in sleep disorders such as narcolepsy. Antidepressants, including fluoxetine and tricyclics such as imipramine, can help cataplexy (sudden loss of muscle tone) in narcolepsy. Modafinil is a drug with stimulant properties and it is used to promote wakefulness in narcolepsy and allied disorders.

Dauvilliers Y, Arnulf I, and Mignot E. Narcolepsy with cataplexy. *Lancet* 2007; **369**: 499–511.

93. D. Pindolol acts as a partial agonist at 5-HT_{1A} receptors. Several controlled studies in the past have shown that the addition of pindolol to SSRI therapy rapidly potentiates the effects of these antidepressants. However, despite the rapidity of improvement with the combination, most studies found no overall advantage at the end of the study period. Systematic review of randomized controlled trials does not support the use of pindolol and β-blockers are not licensed for the treatment of depression. Pentazocine is a partial agonist at kappa opiate receptors; it has some psychotomimetic properties but is not used as an antidepressant. In fact, it may induce depression. Tramadol is an opioid analgesic with no antidepressant effects.

Stimpson N, Agrawal N, and Lewis G. Randomized controlled trials investigating pharmacological and psychological interventions for treatment-refractory depression. Systematic review. *British Journal of Psychiatry* 2002; **181**: 284–294.

94. E. The mean elimination half-life of atomoxetine after oral administration is 5.2 hours. In poor metabolizers (CYP2D6 polymorphism) the mean elimination half-life is more than 20 hours, due to reduced clearance. Nearly 80% of atomoxetine is excreted in the urine. Atomoxetine does not affect the cytochrome P450 2D6 enzyme system. The effects of atomoxetine last longer than would be expected from its half-life; hence, once-daily administration is effective.

Barton, J. Atomoxetine: a new pharmacotherapeutic approach in the management of attention deficit/hyperactivity disorder. *Archives of Diseases in Childhood* 2005; **90** (Suppl. I): i26–i29.

95. C. Antidepressant combinations involving MAOIs require close monitoring due to the risk of serotonergic and hypertensive side-effects. Phenelzine is supposed to be the safest MAO-A inhibitor in combination therapy for depression. It is a derivative of hydrazine similar to isoniazid, but the latter is mainly used as an antituberculosis drug and has only a weak antidepressant action. Selegiline is an MAO-B inhibitor.

Palaniyappan L, Insole L, and Ferrier IN. Combining antidepressants: a review of evidence. *Advances in Psychiatric Treatment* 2009; **15**: 90–99.

- 1. A 64-year-old lady, on physical examination exhibits symptoms suggestive of a movement disorder with associated speech deficits. This clinical presentation is classified as 'hypokinetic dysarthria' by her neurologist. It is associated with**
 - A. Parkinson's disease
 - B. Huntington's disease
 - C. Spasmodic dysphonia
 - D. Multiple sclerosis
 - E. Myasthenia gravis
- 2. A 32-year-old man is diagnosed with a right-sided hemiparesis. On examination, his speech shows non-fluent aphasia. His comprehension is intact, but repetition is impaired. He is most likely to have**
 - A. Transcortical motor aphasia
 - B. Transcortical sensory aphasia
 - C. Conduction aphasia
 - D. Broca's aphasia
 - E. Wernicke's aphasia
- 3. A patient presents with features suggestive of Gerstmann's syndrome. He also has aphasia. Which of the following is the most likely type of aphasia with which he may present?**
 - A. Transcortical sensory aphasia
 - B. Transcortical motor aphasia
 - C. Anomic aphasia
 - D. Global aphasia
 - E. Broca's aphasia
- 4. Regarding aphasia, which of the following statements is true?**
 - A. Broca's aphasia presents with logorrhoea.
 - B. Neologism is a feature of Broca's aphasia.
 - C. Paragrammatism is a feature of Wernicke's aphasia.
 - D. Pure word deafness is associated with loss of naming.
 - E. Involvement of the posterior cerebral artery leads to global aphasia.

5. Which of the following is true regarding acquired defects in reading and writing?

- A. Alexia without agraphia is called acquired illiteracy.
- B. Alexia without agraphia is seen in association with Gerstmann's syndrome.
- C. Anomic aphasia is associated with Gerstmann's syndrome.
- D. Transcortical aphasia is due to lesions in the arcuate fasciculus.
- E. Alexia without agraphia is seen in posterior cerebral artery stroke.

6. The clinical sign of finger–nose ataxia is seen in lesions of which of the following structures?

- A. Superior colliculus
- B. Inferior colliculus
- C. Pyramidal decussation
- D. Inferior olivary nucleus
- E. Thalamus

7. A patient is observed to be repeating the phrases or words spoken by the examiner. Which of the following can cause this phenomenon?

- A. Transcortical motor aphasia
- B. Transcortical sensory aphasia
- C. Mixed transcortical aphasia
- D. Huntington's disease
- E. All of the above

8. Neuropsychiatric Interview (NPI) is often employed in patients with dementia or cognitive deterioration to detect psychiatric and behavioural problems. Which of the following is not tested by the NPI?

- A. Thought disturbance
- B. Perceptual disturbance
- C. Affective disturbance
- D. Abnormalities in sleep pattern
- E. Disorientation

9. Regarding handedness, which of these statements is true?

- A. The population can be divided into two categories: right and left handed.
- B. 60% of the population are right handed.
- C. 75% of right-handed people are left-hemisphere dominant for language.
- D. 60% of left-handed people are left-hemisphere dominant for language.
- E. Left-handed people are less likely than right-handed ones to have bilateral language representation.

10. A patient with a history of traumatic brain injury undergoes neuropsychological testing. In part A of the test he is asked to connect numbered circles on a paper as fast as he can in correct order, using a pen. In part B of the same test the same task is repeated but numbers and alphabets occur in alternate sequences. Which of the following statements is correct with regard to this test?

- A. This is called letter cancellation task.
- B. This test is not sensitive to progressive cognitive decline in dementia.
- C. Part A of the test corresponds more closely to executive functioning than part B.
- D. Patients with traumatic injury perform this test slower than average.
- E. This is purely a test of selective attention.

11. Which of the following matches is incorrect regarding amnestic syndrome and site of lesion?

- A. Wernicke–Korsakoff syndrome–thalamic nuclei
- B. Herpes simplex encephalitis–anterior temporal cortex
- C. Crutzfeld–Jakob disease–diffuse cortical
- D. Anterior communicating artery stroke–medial temporal cortex
- E. Complex partial seizures–hippocampal damage

12. Which of the following is a component of the triad in Balint's syndrome?

- A. Visual neglect
- B. Achromatopsia
- C. Prosopagnosia
- D. Simultanagnosia
- E. Anosognosia

13. Features of Gerstmann's syndrome include all of the following except

- A. Dysgraphia
- B. Finger agnosia
- C. Dysarthria
- D. Inability to distinguish left from right
- E. Acalculia

14. Blindsight is a feature of which of the following focal cortical syndromes?

- A. Balint's syndrome
- B. Geschwind's syndrome
- C. Charcot–Willibrand syndrome
- D. Anton's syndrome
- E. Central achromatopsia

- 15. A patient is not able to perform sequential motor acts despite intact comprehension, muscle power, and ability to perform single-step commands. He is exhibiting**
- A. Ideational apraxia
 - B. Ideomotor apraxia
 - C. Conceptual apraxia
 - D. Conduction apraxia
 - E. Dissociation apraxia
- 16. Which of the following is true about limb-kinetic apraxia?**
- A. Tasks such as finger tapping and pegboard are typically unimpaired.
 - B. Picking up objects using pincer grasp is spared.
 - C. It usually affects the hand that is ipsilateral to a hemispheric lesion.
 - D. The lesion is localized to the contralateral premotor cortex.
 - E. Patients typically present with an inability to perform multistep motor task.
- 17. Which of the following refers to defective recognition of sensory stimuli despite having intact sensory pathways?**
- A. Agnosia
 - B. Alexia
 - C. Anosognosia
 - D. Apraxia
 - E. Abulia
- 18. A 55-year-old man finds it difficult to recognize faces. On further testing, his ability to discriminate faces and match faces is intact. The most likely condition he is suffering from is**
- A. Apperceptive prosopagnosia
 - B. Associative prosopagnosia
 - C. Apperceptive visual object agnosia
 - D. Simultanagnosia
 - E. Central achromatopsia
- 19. Which of the following is true regarding episodic memory?**
- A. Episodic memory is implicit and non-declarative.
 - B. Episodic memory loss is not seen without medial temporal lesions.
 - C. Episodic memory loss can present as anterograde or retrograde amnesia.
 - D. Episodic memory applies only to events of personal significance.
 - E. Episodic memory is more often preserved than semantic memory in dementia.

20. During bedside cognitive testing, a 40-year-old patient is asked to give the years when World War II took place. Which of the following memories is tested here?

- A. Procedural memory
- B. Episodic memory
- C. Semantic memory
- D. Implicit memory
- E. Non-declarative memory

21. A 35-year-old woman recently separated from her boyfriend of 5 years was brought to the A&E with loss of memory. On examination, her memory loss is specific to events associated with her boy friend. But she remembers other events that took place around the same time. She is most probably suffering from

- A. Localized amnesia
- B. Selective amnesia
- C. Generalized amnesia
- D. Continuous amnesia
- E. Systematized amnesia

22. After an enjoyable evening with friends at a pub, Tom calculates the cost of the number of drinks that he had, subtracts the total from the value of money he gave the bartender, and calculates the change that is due. The system of memory that enables such calculation is

- A. Episodic memory
- B. Semantic memory
- C. Procedural memory
- D. Working memory
- E. Retrograde memory

23. Which of the following conditions does not show predominant abnormality in procedural memory?

- A. Parkinson's disease
- B. Huntington's disease
- C. Progressive supranuclear palsy
- D. Olivopontocerebellar degeneration
- E. Early Alzheimer's disease

24. A patient who had developed a pyloric stenosis following ingestion of sulphuric acid develops a confusional state, ophthalmoplegia, and ataxia. Which of the following is not true?

- A. A CT scan may reveal bilateral hypodense areas in the medial thalamus.
- B. The patient may present with difficulty in learning new information.
- C. Administration of thiamine in the acute phase may prevent the emergence of chronic amnesia syndrome.
- D. Confabulation is most common in the early stage of the amnesia syndrome.
- E. The patient's memory of events before the onset of amnesia is always normal.

25. Which of the following is the least valuable clinical indicator of severity of head injury?

- A. Duration of retrograde amnesia
- B. Glasgow Coma Scale
- C. Duration of unconsciousness
- D. Neurological lesions noted using an MRI
- E. Duration of post-traumatic amnesia

26. A 24-year-old patient is admitted to a head injury unit following a road traffic accident. He recovers well from acute neurological deficits but is diagnosed with post-concussion syndrome. Which of the following statements pertaining to his condition is true?

- A. There is a consistent relationship between severity of injury and the presence of post-concussion syndrome.
- B. Diplopia is an early symptom of post-concussion syndrome.
- C. CT scans show brain lesions in up to 50% of patients in the first week.
- D. Psychological factors are more likely to play a role in illnesses of shorter duration.
- E. There is no association between the presence of symptoms and compensatory claims.

27. A 30-year-old man who was involved in a road traffic accident was unconscious for 10 minutes. His CT scan was normal and he is now conscious, but complaining of a bad headache. The family is concerned about him developing seizures as his father has a history of epilepsy. What is the next line of action?

- A. Start phenytoin for 1 to 2 weeks
- B. Start prophylactic carbamazepine for a year
- C. Start long-term benzodiazepines
- D. An abnormal EEG in this patient is an indication for starting prophylactic antiepileptic medication
- E. Antiepileptics are not indicated

28. A 25-year-old patient presented with a history of recurrent, unilateral visual disturbances that resolved completely, on-and-off episodes of pins and needles in her left hand, and recent-onset bladder disturbances. Which of the following statements regarding this illness is true?

- A. The risk of her developing a major depressive disorder is 5–10% during her lifetime.
- B. Her likelihood of developing suicidal ideation is similar to that in the general population.
- C. She is 10 times more likely to develop a manic episode compared to the general population.
- D. Pathological laughing and crying is seen in around 10% of cases.
- E. There is no risk of triggering a relapse of neurological condition with ECT.

29. Which of the following statements regarding cognitive impairment in multiple sclerosis is true?

- A. Cognitive deficits are secondary to depressive symptoms.
- B. Cognitive deficits are closely related to physical disability and duration of illness.
- C. Memory deficits in multiple sclerosis are more apparent on recall compared to recognition.
- D. MMSE is a good test to screen for cognitive deficits in multiple sclerosis.
- E. Donepezil has not been found to be useful in improving memory in multiple sclerosis.

30. Which of the following statements regarding pathological laughing and crying is true?

- A. It is always associated with motor deficits such as pseudobulbar palsy.
- B. Exaggerated crying and laughing is attributed to an underlying mood disorder.
- C. Antidepressants have been found to be of no use in treatment.
- D. It has been associated with frontal executive function deficits.
- E. By definition, patients cannot have a comorbid mood disorder.

31. Consciousness is preserved in which of the following types of seizures?

- A. Tonic-clonic seizures
- B. Simple partial seizures
- C. Status epilepticus
- D. Absence seizures
- E. Complex partial seizures

32. A 45-year-old lady developed recurrent seizures with aura, automatism, and lip smacking. Ictal EEG showed spike and sharp waves complex along the right temporal region. Which of the following statements regarding her diagnosis is not true?

- A. The aura itself constitute a simple partial seizure.
- B. This presentation is highly suggestive of complex partial seizure.
- C. There is an increased chance of this lady developing mania in her lifetime.
- D. A right-sided focus increases the risk of depression compared to mania.
- E. There is a five-times increase in the risk of suicide compared to the general population.

33. Features suggestive of Geschwind's syndrome include all except

- A. Circumstantiality
- B. Hypographia
- C. Hyper-religiosity
- D. Viscosity
- E. Increased aggression

34. A 23-year-old patient previously diagnosed with epilepsy presents to casualty with intractable seizures following the breakup of a relationship. She has been compliant on her medications. The neurologist suspects psychogenic non-epileptic seizures. Which of the following statements is true with regard to her condition?

- A. A postictal prolactin elevation of two times the baseline level is reliable in diagnosing true seizures.
- B. Up to 80% of patients with seizures have psychogenic non-epileptic seizures.
- C. Less than 5% of cases with intractable seizures have psychogenic non-epileptic seizures.
- D. Presence of tongue bite and incontinence is diagnostic of true seizures.
- E. Video EEG recording is the gold standard for diagnosing psychogenic non-epileptic seizures.

35. Early onset of major depression is most commonly associated with stroke pertaining to which of the following regions of the brain?

- A. Right anterior
- B. Right posterior
- C. Left anterior
- D. Left posterior
- E. Bilateral posterior

36. A 67-year-old business man is admitted to a stroke unit. He is having significant aphasia. He has episodes of anger outburst when someone tries to communicate with him. Which of the following is false regarding this 'catastrophic reaction'?

- A. Family history of psychiatric disorders is more common in those with catastrophic reaction.
- B. It is associated with the presence of major depression.
- C. The reaction is mostly secondary to the presence of aphasia.
- D. Patients are more likely to have a personal history of psychiatric disorders.
- E. Higher frequency of basal ganglia lesions may be seen.

37. Which of the following statements about poststroke depression is true?

- A. Younger age predisposes to poststroke depression.
- B. Cortical atrophy prior to stroke predisposes to poststroke depression.
- C. Male sex is a risk factor for poststroke depression.
- D. Lower educational status is a risk factor for poststroke depression.
- E. Lower socioeconomic status is a risk factor for poststroke depression.

38. A 67-year-old patient with stroke has left inferior quadrantanopia, left hemineglect, and dressing apraxia with mild hemiparesis on neurological examination. Which artery is most likely to be involved in the stroke?

- A. Posterior cerebral artery
- B. Middle cerebral artery
- C. Anterior cerebral artery
- D. Common carotid artery
- E. Internal carotid artery

39. Which of the following stages of sleep is characterized by more than 50% delta activity in the EEG?

- A. Stage 1 NREM
- B. Stage 2 NREM
- C. Stage 3 NREM
- D. Stage 4 NREM
- E. REM sleep

40. All the following are features of REM sleep except

- A. Low brain oxygen consumption
- B. High cerebral blood flow
- C. Penile erection
- D. Absent electrodermal activity
- E. Dream-like mental state

41. Regarding sleep terror, which of the following statements is false?

- A. It is associated with REM sleep disturbance.
- B. Vocalizations may occur during the episode.
- C. There is usually amnesia for these episodes.
- D. It becomes exacerbated by sleep deprivation.
- E. It is associated with psychopathology in adults.

42. A 25-year-old man complains of excessive daytime sleepiness. He loses balance and falls down every time he laughs at a joke. He also complains of seeing 'ghosts' while falling asleep. Which of the following is likely to be found in this patient?

- A. A sleep-onset slow wave stage
- B. Excess of hypocretin in the hypothalamus
- C. Seizure activity on electroencephalography
- D. Episodes of sleep paralysis
- E. Absence of REM on polysomnography

43. All of the following increases the risk of developing dementia in those with Parkinson's disease except

- A. Older age group
- B. Greater severity of motor disturbances
- C. Longer duration of Parkinson's disease
- D. Being female
- E. Significant functional disability

44. Which of the following is considered as a 'Parkinson plus' syndrome?

- A. Wilson's disease
- B. Fredreich's ataxia
- C. Progressive supranuclear palsy
- D. Amyotrophic lateral sclerosis
- E. Guillain–Barré syndrome

45. A 64-year-old man presents with sudden-onset blindness that started as a 'curtain coming down' and he lost his vision completely for a few minutes. Within 15 minutes this improved and was restored to full, normal vision. The origin of emboli in this case is most likely to be at

- A. Posterior cerebral artery
- B. Anterior cerebral artery
- C. Internal carotid artery
- D. Anterior communicating artery
- E. Middle cerebral artery

46. A 21-year-old lady is found wandering at a public place. She is unaware of her address or any other personal details. She was admitted and later found to be on the missing persons register at a police station 100 miles away. After 4 weeks, she regains normal memory and remembers having lost her mother in a fire accident 6 weeks ago. Which of the following is true about the nature of her memory problems?

- A. Total amnesia for past events may be seen during the episode.
- B. No amnesia for the episode will be present following recovery.
- C. A vascular aetiology is most likely.
- D. Inability to learn new materials will be seen during the episode.
- E. Episodes are often accompanied by other neurological symptoms.

47. A 63-year-old man with alcohol dependence suffers a serious head injury. On recovery he is found to have unusual behaviours. When a tooth brush is placed in front of him, he immediately begins to brush his teeth, even in entirely inappropriate contexts. He is exhibiting

- A. Alien hand syndrome
- B. Klüver–Bucy syndrome
- C. Utilization behaviour
- D. Executive dysfunction
- E. Balint's syndrome

48. The most probable site of a lesion for the patient described in Question 47 is

- A. Frontal lobes
- B. Dominant parietal lobe
- C. Occipitoparietal junctions bilaterally
- D. Bilateral amygdala
- E. Corpus callosum

49. A 32-year-old woman with complex partial seizures is referred to a psychiatrist to exclude psychosis. She experiences olfactory hallucinations and intense anxiety. Which of the following is not correct with regard to complex partial seizures?

- A. Temporal lobe is the most common site of origin.
- B. Ictal hallucinations are often accompanied by emotional reactions.
- C. Patients are often aware of the unreal nature of the hallucinations.
- D. Irritability is the most common emotional reaction accompanying the aura.
- E. Déjà vu is a well-known phenomenon occurring in complex partial seizures.

50. A 78-year-old woman presents with fluent progressive aphasia with preservation of new learning and orientation. On follow up she is observed to have progressive difficulties in understanding the meaning of words used during normal conversation. She is most likely to have

- A. Alzheimer's dementia
- B. Semantic dementia
- C. Lewy body dementia
- D. Broca's aphasia
- E. Vitamin B₁₂ deficiency

51. Which of the following can be used to test premorbid IQ in patients with neurological damage?

- A. National Adult Reading Test
- B. Rivermead Behavioural Memory Test
- C. Weschler's Memory Scale
- D. Mini Mental State Examination
- E. Minnesota Multiphasic Inventory

- 52. A 55-year-old man with history of long-standing, untreated hypertension is brought to A&E by his wife following 3 hours of 'confusion'. He was repeatedly questioning her and was not able to remember what he was doing 30 minutes ago. He is also unaware of events of the past 2 weeks, despite remembering them until 3 hours ago. Neurological examination is otherwise unremarkable and he has no psychiatric history. The episode resolves by itself within 24 hours. Which of the following is false with regard to his condition?**
- A. Immediate memory will be intact.
 - B. Anterograde amnesia will be predominant.
 - C. Patchy and inconsistent retrograde amnesia will be seen.
 - D. Visuospatial and problem-solving functions will be affected.
 - E. Rapid recovery occurs in most individuals.
- 53. Abnormalities in which of the following vascular territories is implicated in the presentation described in Question 52?**
- A. Anterior cerebral circulation
 - B. Middle cerebral circulation
 - C. Posterior cerebral circulation
 - D. Cortical venous sinus outflow
 - E. Middle meningeal circulation
- 54. A patient with long-standing, uncontrolled type 2 diabetes presents with anterior spinal artery occlusion. Which of the following sensations carried by the spinal cord is most likely to be affected?**
- A. Proprioception
 - B. Vibration
 - C. Pain
 - D. Joint position
 - E. Light touch
- 55. Which of the following structures is a part of cerebellum?**
- A. Dentate nucleus
 - B. Red nucleus
 - C. Substantia nigra
 - D. Subthalamic nucleus
 - E. Insular cortex
- 56. Which of the following is true with respect to pseudobulbar palsy?**
- A. It is caused by diffuse brain stem damage.
 - B. It is often accompanied by flaccid tongue.
 - C. Jaw jerk is exaggerated.
 - D. It is seen in poliomyelitis.
 - E. Frontal release signs are inconsistent with the diagnosis.

57. Lesions of the subthalamic nucleus are associated with

- A. Chorea
- B. Hemiballismus
- C. Tics
- D. Epilepsy
- E. Visual neglect

58. Which of the following neuropsychological tests is primarily used to detect errors in set-shifting capacity?

- A. Tower of London
- B. Rey Osterrieth Complex Figure Test
- C. Wisconsin Card Sorting Test
- D. Word Fluency Test
- E. Letter Cancellation Test

59. A 72-year-old man is afflicted with stroke. He is not able to identify objects with their correct names but is able to demonstrate the usage correctly. When the correct name is given to him, he is able to recognize it correctly. He is suffering from

- A. Motor aphasia
- B. Apraxia
- C. Anomic aphasia
- D. Sensory aphasia
- E. Agraphia

60. The blood supply to the hippocampus comes from the

- A. Basilar artery
- B. Anterior communicating artery
- C. Anterior cerebral artery
- D. Anterior choroidal artery
- E. Lenticulostriate arteries

61. In early Alzheimer's disease, widespread loss of nerve cells is most pronounced in which of the following structures?

- A. Layer III of cerebral cortex
- B. Layer IV of entorhinal cortex
- C. Layer I of cerebral cortex
- D. Layer II of entorhinal cortex
- E. Layer IV of cerebral cortex

62. Glutamate-induced excitotoxicity is proposed as a cause of which of the following conditions?

- A. Huntington's disease
- B. Crutzfeld-Jakob disease
- C. Wilson's disease
- D. Korsakoff's syndrome
- E. Weber's syndrome

- 63. Which of the following is a feature of occlusion of the right-sided posterior inferior cerebellar artery?**
- A. Left-sided loss of facial pain sensation
 - B. Left-sided loss of facial temperature sensation
 - C. Loss of pain sensation on the right side of the body
 - D. Loss of temperature sensation on the left side of the body
 - E. Mydriasis of the right eye
- 64. A 65-year-old man presents with memory difficulties and loss of balance. He has significant, new-onset urinary incontinence. CT scan of the brain shows dilated ventricles but no significant widening of sulci. The most likely diagnosis is**
- A. Normal-pressure hydrocephalus
 - B. Alzheimer's dementia
 - C. Lewy body dementia
 - D. Benign intracranial hypertension
 - E. Alcoholic dementia
- 65. During polysomnographic recording of a patient with sleep disturbances, it is observed that his heart rate and blood pressure are lower than that recorded during normal wakefulness. His muscle tone is also notably low. Which of the following is true with respect to his physiological state?**
- A. Vivid memory of dreams occur at this stage.
 - B. If awakened from this stage there will be some degree of confusion.
 - C. Penile erection occurs automatically at this stage of sleep.
 - D. High cerebral blood flow is seen at this stage.
 - E. In adults, 25% of sleeping time is spent in this stage of sleep.
- 66. The frequency of alpha waves seen in EEG recordings is**
- A. >13 Hz
 - B. 8–12 Hz
 - C. 4–8 Hz
 - D. 0.5–4 Hz
 - E. <0.5 Hz
- 67. Diffuse flattening of EEG with low-amplitude theta and delta waves is seen in**
- A. Huntington's disease
 - B. Alzheimer's dementia
 - C. Hepatic encephalopathy
 - D. Delirium tremens
 - E. Crutzfeld–Jakob disease

68. Which of the following functions is mediated by endogenous cannabinoids?

- A. REM sleep induction
- B. Motor coordination
- C. Peripheral sympathetic modulation
- D. Gut motility
- E. Mediation of intraocular pressure

69. A 22-year-old man is diagnosed with craniopharyngioma. He is experiencing symptoms due to the tumour pressing upon adjacent brain tissue. Which of the following visual defect is characteristic of this tumour?

- A. Tunnel vision
- B. Homonymous hemianopia
- C. Binasal hemianopia
- D. Bitemporal hemianopia
- E. Superior quadrantanopia

70. Priapism is a side-effect associated with which of the following?

- A. α_1 receptor stimulation
- B. α_2 receptor stimulation
- C. α_1 receptor blockade
- D. α_2 receptor blockade
- E. Nicotinic cholinergic stimulation

71. Metacognitive abilities are proposed to be functions of the frontal lobe.

Metacognition refers to

- A. Planning and sequential execution of motor acts
- B. Ability to reflect on one's own cognitive processes
- C. Problem-solving ability
- D. Initiation and sustainment of motivation
- E. Automatic cognitive processing without selected focus of attention

72. The 'n-back test' consists of making a response in accordance with a visual or auditory stimulus presented 'n' items before the currently displayed stimulus. This test is widely employed in neuroimaging paradigms primarily to enable engagement of which of the following brain areas?

- A. Frontal lobes
- B. Occipital lobes
- C. Cerebellum
- D. Hippocampus
- E. Amygdala

73. Which of the following toxins has been used to simulate a model of Parkinson's disease?

- A. Ketamine
- B. Methyl phenyl tetrahydropyridine (MPTP)
- C. Methylene dioxy methamphetamine (MDMA)
- D. Vanillyl mandelic acid (VMA)
- E. Hydroxy indole acetic acid (5HIAA)

74. How many layers are present in the laminar structure of the human cerebral cortex?

- A. Three
- B. Four
- C. Twelve
- D. Six
- E. Two

75. Which of the following nuclei of the thalamus is primarily involved in the relay of information for visual processing?

- A. Supraoptic nucleus
- B. Dorsomedial nucleus
- C. Medial geniculate nucleus
- D. Suprachiasmatic nucleus
- E. Lateral geniculate nucleus

76. Which of the following cells are the only excitatory neurones in the cerebellum?

- A. Purkinje cells
- B. Basket cells
- C. Stellate cells
- D. Granule cells
- E. Golgi cells

77. Which of the following components of cognition is tested by the digit span task?

- A. Working memory
- B. Implicit memory
- C. Sensory memory
- D. Autobiographic memory
- E. Procedural memory

78. Ataxia can result from cerebellar lesions or posterior column lesions.

Though gait disturbances are predominant in both these conditions, which of the following is seen in sensory ataxia but not cerebellar ataxia?

- A. Nystagmus
- B. Dysarthria
- C. Loss of tendon reflexes
- D. Absence of Romberg's sign
- E. Intact joint position sense

79. The ability of neurones to change the connection strength with other neurones underlies the electrophysiological process called long-term potentiation (LTP). Which of the following forms the neurochemical basis of LTP?

- A. Acetylcholine via nicotinic receptors
- B. Substance P
- C. Glutamate via NMDA receptors
- D. Dopamine via D4 receptors
- E. Cannabinoids via CB1 receptors

80. Which of the following is a major dopaminergic site?

- A. Nucleus basalis
- B. Ventral tegmental area
- C. Dorsal raphe nucleus
- D. Spinal interneurones
- E. Locus coeruleus

81. Which of the following brain regions shows a preferential degeneration in Alzheimer's disease?

- A. Nucleus basalis
- B. Ventral tegmental area
- C. Dorsal raphe nucleus
- D. Spinal interneurones
- E. Locus coeruleus

82. Processing of fear conditioning is associated with functions of the

- A. Planum temporale
- B. Heschl's gyrus
- C. Amygdala
- D. Anterior pituitary
- E. Angular gyrus

83. Which of the following enzymes involved in neurotransmitter synthesis is directly affected by pyridoxine deficiency?

- A. Glutamate decarboxylase
- B. Acetyl cholinesterase
- C. Dopamine hydroxylase
- D. Tyrosine hydroxylase
- E. Tryptophan hydroxylase

84. Which of the following brain areas has a relatively permeable blood–tissue interface?

- A. Anterior pituitary
- B. Hippocampus
- C. Subfornicular organ
- D. Cerebellum
- E. Lateral surface of frontal lobes

85. Which of the following terms refers to a substance that influences neuronal activity and originates from non-synaptic sites?

- A. Neurotransmitter
- B. Neurotrophin
- C. Neuromodulator
- D. Second messenger
- E. Neurohormone

86. Which of the following neurotransmitters act as a physiological antagonist for acetylcholine?

- A. Serotonin
- B. Substance P
- C. Neurokinin
- D. Norepinephrine
- E. Nicotine

87. Which of the following is not a ligand-gated ion channel?

- A. Nicotinic cholinergic receptors
- B. GABA_A receptors
- C. Glycine receptors
- D. NMDA receptors
- E. Muscarinic cholinergic receptors

88. ¹¹C raclopride is a commonly used PET ligand. Which of the following receptors can be identified by ¹¹C raclopride?

- A. Serotonin receptors
- B. GABA_A receptors
- C. Muscarinic cholinergic receptors
- D. Postsynaptic dopamine receptors (D2/D3)
- E. Presynaptic dopamine reuptake inhibitor

89. Leptin is a hormone involved in regulation of adiposity and meal intake.

Which of the following structures is the major source of leptin?

- A. Hypothalamus
- B. Gut epithelium
- C. Hepatocytes in liver
- D. Adipose tissue
- E. Mitochondria-rich muscle fibres

90. Which of the following substances does not interact with cell membrane receptors and acts directly on nuclear material to produce physiological effects?

- A. Serotonin
- B. Growth hormone
- C. Norepinephrine
- D. Dopamine
- E. Thyroid hormone

91. A 77-year-old woman dies of severe pneumonia with sepsis at a care home. She had poor episodic memory for recent events and deteriorating language functions for at least 2 years before her death. The most likely pathology that could be seen in her brain tissue is

- A. Ballooning of cells with intraneuronal accumulations
- B. Diffuse and neuritic plaques with amyloid deposits in cortex and hippocampus
- C. Diffuse amyloid deposition restricted to blood vessels
- D. Lysosomal accumulations within neuronal cytoplasm
- E. Eosinophilic rod-shaped inclusions of actin filaments

92. Which of the following receptors, on stimulation, reduces serotonin release?

- A. 5-HT_{1B}
- B. 5-HT_{1D}
- C. 5-HT_{1A}
- D. 5-HT₂
- E. 5-HT₃

93. All of the following are true with respect to dopamine metabolism except

- A. Monoamine oxidase is the primary metabolic enzyme.
- B. All dopamine from the re-uptake process gets repackaged into presynaptic vesicles.
- C. Catechol-O-methyl transferase is present in cytoplasm of postsynaptic neurones.
- D. Homovanillic acid is a primary metabolite.
- E. Monoamine oxidase type B is more selective for dopamine.

- 94. Neuroendocrine abnormalities have been documented in depression and other psychiatric disorders. Which of the following is not a neuroendocrine abnormality seen in depression?**
- A. Blunted growth hormone (GH) response to levodopa
 - B. Enhanced growth hormone response to apomorphine
 - C. Blunted thyroid-stimulating hormone (TSH) response to thyrotrophin-releasing hormone (TRH)
 - D. Failure of exogenous steroid to suppress cortisol
 - E. Blunted prolactin release on clomipramine challenge
- 95. Event-related potentials (ERP) are records of the brain's electrical activity in response to various stimuli. P300 is an extensively studied ERP in psychiatry. Which of the following is true with respect to P300 abnormalities in schizophrenia?**
- A. P300 is a state rather than a trait marker in schizophrenia.
 - B. Schizophrenia with early age of onset shows less pronounced P300 abnormalities.
 - C. Reduced P300 amplitude is specific for schizophrenia.
 - D. Paranoid subtype is associated with more pronounced P300 abnormalities.
 - E. P300 is affected by duration of disease in patients with schizophrenia.
- 96. Which of the following tests for intelligence is not influenced by language or formal education?**
- A. Wechsler's Adult Intelligence Scale
 - B. Stanford-Binet Test
 - C. Raven's Progressive Matrices
 - D. Wechsler's Intelligence Scale For Children
 - E. Kaufman Adolescents and Adults Intelligence Test
- 97. Neuropeptides such as endorphins are produced from the degradation of a large precursor molecule called pro-opiomelanocortin (POMC). Which of the following hormones is synthesized from the same precursor?**
- A. Thyroxine
 - B. Thyroid-stimulating hormone (TSH)
 - C. Adrenocorticotropic hormone (ACTH)
 - D. Growth hormone
 - E. Antidiuretic hormone (ADH)
- 98. All of the following physiological effects are mediated by GABA potentiation except**
- A. Sedation
 - B. Working memory
 - C. Increase in seizure threshold
 - D. Muscle relaxation
 - E. Inhibition of memory consolidation

99. Which of the following structures in human brain show morphological differences according to one's sexual orientation?

- A. Red nucleus
- B. Medial dorsal thalamus
- C. Nucleus tractus solitarius
- D. Interstitial nucleus of anterior hypothalamus
- E. Pineal gland

100. Which of the following proteins is the major component of Lewy bodies seen in Parkinson's disease and Lewy body dementia?

- A. Amyloid precursor protein
- B. Prion protein
- C. Ceruloplasmin
- D. Amylin
- E. Alpha synuclein

101. Proliferation of large protoplasmic astrocytes results in atypical cells such as Opalski cells and Alzheimer cells. Presence of such astrocytes is a pathological feature of

- A. Alzheimer's dementia
- B. Fragile-X syndrome
- C. Frontotemporal dementia
- D. Multiple sclerosis
- E. Wilson's disease

102. Which of the following statements regarding the teratogenic effect of alcohol on neuronal development is false?

- A. Alcohol induces apoptosis in the fetal brain.
- B. Even a single episode of excessive alcohol exposure can be harmful.
- C. The most prominent pathological finding in fetal alcohol syndrome is scarring of the thalamus.
- D. Facial malformations occur when the exposure is in the first trimester.
- E. Thiamine deficiency is the most important mediator of neuronal damage seen in fetal alcohol syndrome.

103. Features of the cauda equina syndrome include all except

- A. Asymmetric leg weakness
- B. Loss of deep tendon reflex
- C. Prominent sphincter dysfunction
- D. Low back pain
- E. Sensory loss

104. Which of the embryonic germ cell layers give rise to neurones?

- A. Neural tube
- B. Neural crest
- C. Mesoderm
- D. Ectoderm
- E. Notochord

105. All of the following are features of lesion to the cerebellum except

- A. Dysarthria
- B. Dysmetria
- C. Intentional tremor
- D. Ipsilateral hypotonicity
- E. Sphincter disturbance

106. Which of the following cranial nerves is purely afferent?

- A. Facial nerve
- B. Glossopharyngeal nerve
- C. Hypoglossal nerve
- D. Trochlear nerve
- E. Vestibulocochlear nerve

107. The light reflex pathway includes all of the following except

- A. Ciliary muscles
- B. Edinger-Westphal nucleus
- C. Occipital cortex
- D. Oculomotor nerve
- E. Optic nerve

108. All of the following carry parasympathetic fibres in them except

- A. Facial nerve
- B. Glossopharyngeal nerve
- C. Hypoglossal nerve
- D. Oculomotor nerve
- E. Vagus nerve

109. Which of the following is a result of parasympathetic activity?

- A. Decreased salivation
- B. Ejaculation
- C. Increased heart rate
- D. Relaxation of external anal sphincter
- E. Relaxation of the ciliary muscles

110. The posterior column of the spinal cord is responsible for all of the following except

- A. Light touch
- B. Proprioception
- C. Tactile localization
- D. Temperature discrimination
- E. Vibration sensation

111. Which of the following is not a component of the basal ganglia?

- A. Amygdala
- B. Caudate nucleus
- C. Globus pallidus
- D. Substantia nigra
- E. Subthalamic nucleus

112. Nystagmus is a recognized feature of all of the following except

- A. Barbiturate toxicity
- B. Cerebellopontine angle tumours
- C. Horner's syndrome
- D. Multiple sclerosis
- E. Vertebrobasilar artery insufficiency

113. Which of the following is a feature of normal ageing?

- A. Preserved immediate memory
- B. Decline in general intelligence measures
- C. Preserved executive abilities such as abstraction
- D. Intact verbal fluency
- E. Intact cognitive processing speed

114. Which of the following lesions is commonly associated with gelastic (laughing) seizures?

- A. Hypothalamic tumours
- B. Hippocampal sclerosis
- C. Occipital lesions
- D. Inferior parietal damage
- E. Lesions of corpus callosum

115. Which of the following is a ligand-gated ion channel?

- A. Muscarinic receptor
- B. Norepinephrine receptor
- C. Nicotinic receptor
- D. GABA_B receptor
- E. Metabotropic glutamate receptor

- 116. A 32-year-old man presents with progressive muscle weakness, cognitive impairment, and involuntary movements of upper limbs and facial muscles. A blood film reveals spiked red blood cells. He is troubled by compulsive behaviour pertaining to order and symmetry. Which of the following conditions is most likely?**
- A. Acanthocytosis
 - B. Huntington's chorea
 - C. Haemophilia A
 - D. Wilson's disease
 - E. Progressive supranuclear palsy
- 117. The recreational drug LSD exerts its hallucinogenic effect as a partial agonist at which of the following receptors?**
- A. Dopamine D1
 - B. Glutamate AMPA
 - C. Serotonin 5-HT_{1A}
 - D. Serotonin 5-HT_{2A}
 - E. Cannabinoid CB1
- 118. Which of the following neurotransmitters is implicated in the neurobiology of addiction and behaviours associated with craving seen in recreational drug users?**
- A. GABA
 - B. Dopamine
 - C. Substance P
 - D. Serotonin
 - E. Neurosteroids
- 119. Which of the following can be classified as a neurotrophin?**
- A. BDNF
 - B. Protein kinase C
 - C. Nitric oxide
 - D. COMT
 - E. Vasopressin
- 120. Synthesis of adrenalin from noradrenalin requires which of the following enzymes in a neurone?**
- A. DOPA decarboxylase
 - B. Dopamine hydroxylase
 - C. Monoamine oxidase
 - D. Phenylethanolamine N-methyltransferase
 - E. Tyrosine hydroxylase

121. The majority of serotonin in the human body is found in

- A. Spinal cord
- B. Brain
- C. Gastrointestinal tract
- D. Platelets
- E. Kidneys

122. Which of the following is a feature of a second messenger?

- A. They are a class of neurotransmitters.
- B. They are local hormones secreted by neurones into the blood stream.
- C. They are restricted to the peripheral nervous system.
- D. They combine with neurotransmitters in the nucleus.
- E. They mediate the intracellular response to a neurotransmitter.

123. A 55-year-old man presents to A&E dreading that he has had a stroke. He has a weakness on the right side of his face with drooling of saliva from the right corner of his mouth. On examination he is not able to close his right eye fully and cannot hold air against his right cheek. When attempting a wrinkle, the right eyebrow appears sluggish. He is not able to whistle properly. He has normal tone and power in all four limbs. Which of the following clinical signs can be expected?

- A. Bell's phenomenon
- B. Nystagmus
- C. Miosis of left eye
- D. Plantar extensor
- E. Mydriasis of right eye

124. Regarding the serotonin (5-HT) system in the brain, which of the following statements is false?

- A. Serotonergic cells are localized in the raphe nuclei.
- B. Serotonergic cells project to virtually all areas of the brain.
- C. 5-HT receptors are mostly ionotropic.
- D. Serotonin does not cross the blood-brain barrier.
- E. Serotonin is synthesized from tryptophan.

125. Prion protein PrP^C is seen in normal cells. Pathological changes in this protein can lead to neurodegenerative changes seen in Cruetfeldt-Jakob disease. Which of the following explanations is most likely for the pathological variation?

- A. The pathological protein has a different amino-acid sequence compared to the normal protein.
- B. The pathological protein differs from normal protein in the quantity produced but not in the quality.
- C. The pathological protein is structurally different from normal protein.
- D. The pathological protein is coded by a genetically transmitted mutant DNA.
- E. The pathological protein suppresses the immune system.

- 126. Which of the following brain regions is involved in the regulation of arousal and sleep-wake cycle?**
- A. Amygdala
 - B. Cingulate cortex
 - C. Hippocampus
 - D. Reticular system
 - E. Ventral striatum
- 127. The resting membrane potential of a neurone is estimated to be approximately**
- A. +70 mV
 - B. +90 mV
 - C. 0 mV
 - D. -30 V
 - E. -70 mV
- 128. Which of the following statements with respect to the neurotransmitter glycine is correct?**
- A. It is primarily an excitatory neurotransmitter.
 - B. It acts via GABA_A receptors.
 - C. It is associated with idiopathic epilepsy.
 - D. It facilitates chloride ion entry into neurones.
 - E. It is most abundant in dorsolateral prefrontal cortex.
- 129. Direct measurement of cerebral glucose metabolism is possible using which of the following methods?**
- A. Single photon emission computed tomography
 - B. Computed tomography with radiocontrast
 - C. Positron emission tomography
 - D. Functional magnetic resonance imaging
 - E. Magnetoencephalography
- 130. A nocturnal surge in the level of growth hormones is observed during which of the following stages of sleep?**
- A. REM sleep
 - B. Stage 1 and 2 NREM sleep
 - C. Stage 3 and 4 NREM sleep
 - D. All stages of sleep
 - E. Upon awakening

131. A 15-year-old boy is brought to paediatric A&E by his parents. He complains of severe headache and vomits while waiting to be seen. He gives a history of polyuria and confusion with visual field defects. On examination he appears to be significantly shorter than average height for his age. He does not have signs of meningitis. His past medical history and family history reveals no additional clues to his presentation. He denies using drugs. Which of the following investigations may help in clinching the diagnosis?

- A. CSF analysis
- B. Electroencephalogram
- C. CT brain scan
- D. Neuropsychological testing
- E. Urine drug screen

132. Which of the following structures may be causally related to the presentation in Question 131?

- A. Alar plate
- B. C cells of thyroid
- C. Isthmus of thyroid
- D. Neural tube
- E. Rathke's pouch

133. A 45-year-old man presents with sudden onset, uncontrolled, wide flinging movements of his left arm and leg. He is a known diabetic and has not been taking his antihypertensive medications for the last 2 months. He is cognitively intact. Which of the following is the most likely site of a lesion?

- A. Left cerebellum
- B. Left putamen
- C. Right internal capsule
- D. Right subthalamic nucleus
- E. Right thalamus

134. Phineas Gage is a celebrated case in neuropsychiatry. This 25-year-old railroad foreman sustained an extraordinary brain injury after which he had a significant change in his personality characterized by childishness, stubborn, and obstinate behaviour with frequent use of profanities. Which of the following brain regions was damaged significantly to result in this presentation?

- A. Inferior parietal cortex
- B. Superior temporal cortex
- C. Orbitofrontal cortex
- D. Hippocampus
- E. Hypothalamus

- 135. A 60-year-old man presents with a 4-week history of right foot pain and sensory loss. The GP prescribes an analgesic and makes a referral to a neurologist. While awaiting the specialist appointment, the patient develops left-sided wrist drop and weakness of right hand grip. He does not have any autonomic disturbances and appears to be cognitively intact. The most common cause of the above presentation is**
- A. Diabetes mellitus
 - B. Periarteritis nodosa
 - C. Sarcoidosis
 - D. Leprosy
 - E. Temporal arteritis
- 136. A neuropsychologist administers a test to a 21-year-old man with a change in personality related to brain damage. The patient is asked to name the colour of a word while ignoring the actual word. What test is being administered?**
- A. Wisconsin Card Sorting Test
 - B. Benton Visuomotor Test
 - C. Rorschach's Test
 - D. Continuous Performance Test
 - E. Stroop Test
- 137. Which of the following is the rate-limiting enzyme in the synthesis of dopamine?**
- A. Tyrosine hydroxylase
 - B. DOPA decarboxylase
 - C. Dopamine hydroxylase
 - D. Monoamine oxidase
 - E. Catechol-O-methyl transferase
- 138. A 55-year-old patient presents with bilateral hand tremors that worsen with stress. Which of the following features of the tremor is suggestive of benign essential tremor rather than Parkinsonism?**
- A. Tremor is increased by alcohol
 - B. Tremor is reduced by action
 - C. Tremor is absent at rest
 - D. Frequency of the tremor is 4–6 cycles per second
 - E. The amplitude of the tremor is large

139. A 50-year-old woman, being treated for depression as an outpatient, presents to A&E with acute-onset, severe headache. She describes this as the 'worst headache' she has ever had in her life. She insists on switching off the lights in the examination cubicle. Her blood pressure is 150/90 mmHg. When asked to get up from the examination couch, she complains of neck stiffness. An emergency CT scan is normal. The next most appropriate step is

- A. Change her antidepressant
- B. Obtain MRI scan
- C. Obtain urine drug screen
- D. Prepare for lumbar puncture
- E. Prescribe haloperidol 2.5 mg only

140. A 68-year-old woman has long-standing hypertension. She is diagnosed to have somatization disorder by her GP and is prescribed venlafaxine 225 mg/day. Unfortunately she develops a cerebrovascular accident. While being treated for stroke at the acute neurology unit, she starts having severe, 'gruesome' pain on her left side of the body. The pain has an intense, scalding quality. The most likely site of infarct is

- A. Cerebellum
- B. Cerebello pontine junction
- C. Thalamus
- D. Hippocampus
- E. Internal capsule

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chapter
5

NEUROSCIENCES

ANSWERS

1.A. The answer is Parkinson's disease. Bradykinesia or hypokinesia is a motor feature of Parkinson's disease. Dysarthria is a deficit in the motor aspect of speech. It is usually secondary to a motor neurological deficit. Dysarthria can affect not only articulation, but also phonation, breathing, or prosody (emotional tone) of speech. Total loss of ability to articulate is called anarthria, whereas dysarthria usually involves the distortion of consonant sounds. The Mayo Clinic classification of dysarthria divides dysarthria into six basic types, each one corresponding to a predominant motor disorder: flaccid (lower motor neurone disorders), spastic (upper motor neurone disorders), ataxic (cerebellar lesions), hypokinetic (parkinsonian), hyperkinetic (choreiform/tic disorders), and mixed. Mixed dysarthrias are seen in conditions with multiple motor lesions, for example mixed spastic–ataxia of multiple sclerosis or mixed spastic–flaccidity of amyotrophic lateral sclerosis. Speech therapy may be of substantial benefit to many dysarthric patients.

Cummings JL and Mega MS. *Neuropsychiatry and Behavioural Neuroscience*. Oxford University Press, 2003, p. 74.

Bradley WG, Daroff RB, Fenichel G, and Jankovic J. *Neurology in Clinical Practice: Principles of Diagnosis and Management*, 4th edn. Butterworth-Heinemann, 2003, p. 162.

2. D. Testing a person's speech is usually done in three steps. The first step is to test for the fluency of speech. Non-fluent output is characterized by a paucity of verbal output (usually 10–50 words per minute), whereas fluent aphasics have a normal or even exaggerated verbal output (up to 200 words or more per minute). Lesions of the motor (Broca's) area produce a non-fluent aphasia. Assessment of language comprehension is the second step. Patients with focal lesions limited to the left frontal lobe (Broca's area) will have preserved comprehension (Broca's and transcortical motor aphasia). Patients with left posterior temporal or parietal involvement will show impaired comprehension (Wernicke's, global, transcortical sensory, and isolation aphasias). The third step is to evaluate repetition. Transcortical aphasias usually have an intact repetition. Patients with Broca's, Wernicke's, or conduction aphasia typically show impaired repetition. In conduction aphasia, speech is fluent (as in Wernicke's aphasia) but comprehension is intact (unlike Wernicke's aphasia).

Cummings JL and Mega MS. *Neuropsychiatry and Behavioural Neuroscience*. Oxford University Press, 2003, p. 74.

3.A. Transcortical sensory aphasia is similar to Wernicke's aphasia but is distinguished by the retained ability to repeat. Lesions causing transcortical aphasias do not disrupt the perisylvian language circuit from Wernicke's area through the arcuate fasciculus to Broca's area. Instead, they interrupt connections from other cortical centres into the language circuit (hence the name transcortical). These areas include the dominant angular gyrus, posterior middle temporal gyrus, and periventricular white matter pathways of the temporal isthmus underlying these cortical areas. When this results from involvement of the angular gyrus, it is frequently accompanied by Gerstmann's syndrome, constructional apraxia, and other evidence of the angular gyrus syndrome.

Cummings JL and Mega MS. *Neuropsychiatry and Behavioural Neuroscience*. Oxford University Press, 2003, p. 79.

4.C. Paragrammatism is seen in Wernicke's aphasia. Speech is characterized by being empty of meaning, containing verbal paraphasias, neologisms, and jargon productions. Most patients with Wernicke's aphasia have no elementary motor or sensory deficits. A right homonymous hemianopia may be present. Patients may be unaware of the deficit and may present with paranoia, as they do not realize why others do not understand them. The presence of paragrammatism may be difficult to distinguish from formal thought disorder in schizophrenia. In contrast, Broca's aphasia shows agrammatism. In this case, the speech pattern is non-fluent; on examination, the patient speaks hesitantly, often producing the principal, meaning-containing nouns and verbs but omitting small grammatical words and morphemes. This pattern is called agrammatism or telegraphic speech, for example: 'I go home' or 'wife here morning'. Reading is often impaired in Broca's aphasia despite preserved auditory comprehension. Broca's aphasia is associated with right hemiparesis, hemisensory loss, and apraxia of the non-paralysed left limbs. Due to the awareness of the deficit, patients with Broca's aphasia may be more prone to depression. Pure word deafness is a syndrome of isolated loss of auditory comprehension and repetition, without any abnormality of speech, naming, reading, or writing. It is caused by bilateral, or sometimes a unilateral, lesion, isolating Wernicke's area from input from both Heschl's gyri. A lesion representing most of the territory of the left middle cerebral (not posterior circulation) artery leads to a global aphasia.

Bradley WG, Daroff RB, Fenichel G, and Jankovic J. *Neurology in Clinical Practice: Principles of Diagnosis and Management*, 4th edn. Butterworth-Heinemann, 2003, p. 144.

5.E. Pure alexia without agraphia is associated with left posterior cerebral artery stroke, with infarction of the medial occipital lobe, often the splenium of the corpus callosum, and often the medial temporal lobe. Alexia is the acquired inability to read. Patients with alexia without agraphia can write but cannot read their own writing. Alexia with agraphia is sometimes called acquired illiteracy. Alexia with agraphia is seen in angular gyrus lesions and is associated with Gerstmann's syndrome. It is seen in stroke of the angular branch of the middle cerebral artery. Transcortical aphasias are analogues to the syndromes of global, Broca's, and Wernicke's aphasias, with intact repetition. Lesions producing transcortical aphasias disrupt connections from other cortical centres into the language circuit. Lesions to the arcuate fasciculus (usually in either the superior temporal or inferior parietal regions) present with conduction aphasia.

Bradley WG, Daroff RB, Fenichel G, and Jankovic J. *Neurology in Clinical Practice: Principles of Diagnosis and Management*, 4th edn. Butterworth-Heinemann, 2003, pp. 144–146.

6.D. Inferior olivary lesions lead to appendicular ataxia which can be tested using the finger–nose test. The inferior olivary nucleus serves motor coordination via projecting climbing fibres to the cerebellum. Isolated lesions of superior colliculus result in defective visual saccades. Subtle auditory defects are noted in similar lesions of the inferior colliculus. Pyramidal decussation carries corticospinal fibres; damage to the corticospinal fibres rostral to (above) the pyramidal decussation results in contralateral motor deficits, while lesions below the decussation result in ipsilateral deficits. Thalamic damage often results in sensory deficit syndromes.

Ruigrok TJ. Cerebellar nuclei: the olivary connection. *Progress in Brain Research* 1997; **114**: 167–192.

7.E. Echolalia is the phenomenon where the patient repeats words or phrases said by the examiner; palilalia is the phenomenon where the patient repeats words or phrases that he has uttered himself. In patients who develop both phenomena, echolalia precedes the onset of palilalia. Common causes of echolalia include the transcortical aphasias and disorders that affect the basal ganglia–frontal circuit. Echolalia could be due to a frontal executive deficit, leading to failure of environmental autonomy and resulting in echoing of perceived environmental stimuli. Palilalia should be distinguished from stuttering and logoclonia (repetition of the final syllable of spoken words). Echolalia may be observed as part of speech disturbances in catatonic states.

Cummings JL and Mega MS. *Neuropsychiatry and Behavioural Neuroscience*. Oxford University Press, 2003, p. 90.

8.E. Orientation is a measure of cognitive function. NPI is used for the assessment of thought disturbance, perceptual disturbances, affect, abulia, agitation/aggression, disinhibition, appetite disturbance, sleeping pattern, and aberrant motor activity in patients with dementia/cognitive deficits. It does not test cognitive functions such as memory or orientation.

Goldstein MA. and Silverman ME. Neuropsychiatric assessment. *Psychiatric Clinics of North America* 2005; **28**: 511–515.

9.D. Hemispheric dominance is clinically inferred by handedness. It is a peripheral indicator of cerebral hemispheric language lateralization. Handedness is now considered to exist as a continuum, from extreme unilateral hand dominance on one end to ambidexterity on the other. In this respect, the Edinburgh Handedness Inventory is a semiquantitative measurement of handedness. It is thought that at least 90% of the human population is right-handed. Of these, 95% are left-hemisphere dominant. Approximately 10% of the human population is left-handed and of these at least 60% are left-hemisphere dominant. Left-handers are more likely to have bilateral language representation.

Goldstein MA. and Silverman ME. Neuropsychiatric assessment. *Psychiatric Clinics of North America* 2005; **28**: 511–515.

10.D. This test is called the trail making test. It is not only a test of attention, but it also tests visuomotor tracking and cognitive flexibility (part B). Trail making test A requires the subject to connect numbered dots. Trail making test B requires the subject to connect alternating alphabets and numbers. This tests the ability to shift mental sets and hence to some extent corresponds to executive functioning. This has been shown to be sensitive to change in patients with progressive cognitive decline (e.g. dementia). Patients with traumatic brain injury perform slower on trail making tests.

Lezak MD et al., eds. *Neuropsychological Assessment*, 4th edn. Oxford University Press, 2004, pp. 372–374.

11. D. Medial temporal cortex is not supplied by the anterior communicating artery; it is supplied by the posterior cerebral artery. The anterior communicating artery supplies the basal forebrain and striatum. Wernicke–Korsakoff syndrome is usually associated with nutritional causes, where the thalamic nuclei (especially dorsal medial thalamus) are involved, leading to anterograde amnesia and confabulation. Herpes simplex encephalitis (HSE) is another cause of anterograde amnesia where anterior temporal lobes are often involved. Whether amnesia is predominantly verbal or non-verbal is determined by the side of lesion and the cerebral dominance. In CJD (Creutzfeldt–Jacob disease) diffuse cortical damage occurs. Amnesia of complex partial seizures is related to recurrent hippocampal damage and sclerosis.

Goldstein MA, and Silverman ME. Neuropsychiatric assessment. *Psychiatric Clinics of North America* 2005; **28**: 526.

12. D. Balint's syndrome consist of a triad of oculomotor apraxia (deficits in the orderly visuomotor scanning of the environment), optic ataxia (inaccurate manual reaching toward visual targets), and simultanagnosia. Pathologically, Balint's syndrome is produced by bilateral parieto-occipital lesions. Simultanagnosia is the inability to integrate visual information in the centre of gaze with more peripheral information. The patient gets stuck on the detail that falls in the centre of gaze without scanning the visual environment for additional information. They typically 'miss the forest for the trees.' This leads to a significant disturbance in object identification. A patient with Balint's syndrome when shown a table lamp and asked to name the object may look at its circular base and call it an ash tray!

Kasper DL et al., eds. *Harrison's Principles of Internal Medicine*, 16th edn. McGraw-Hill, 2005, p. 150.

13. C. Dysarthria is not a feature of Gerstmann's syndrome. Full Gerstmann's syndrome, though rarely reported, consists of left–right disorientation, finger agnosia, dysgraphia, and dyscalculia. The lesion is mostly attributed to a dominant parietal lobe dysfunction. When all the components are present the syndrome reliably localizes to the dominant angular gyrus. Gerstmann himself thought that the inability to calculate was because of the fact that children learnt to count with their fingers and the dysgraphia was due to problems with differential finger movements—both being secondary to finger agnosia. Gerstmann noted that the greatest trouble in finger agnostics was with distinguishing second, third, and fourth fingers. Screening for full Gerstmann's syndrome should be performed on patients who show any single component.

Cummings JL and Mega MS. *Neuropsychiatry and Behavioural Neuroscience*. Oxford University Press, 2003, p. 87.

14. D. Anton's syndrome features blindness and denial of blindness, that is the patient is blind but denies sightlessness. The syndrome is most commonly associated with bilateral lesions of the occipital cortex. Blind sight is a paradoxical syndrome seen in patients with cortical blindness. It is the ability of the person to orient towards visual stimuli while there is no conscious visual perception. This is due to the fact that 20 to 30% of fibres of the optic tract are directed to non-geniculate destinations, such as the superior colliculi and pretectal region of the brainstem. It is thought that some visual processing occurs in this non-geniculate system. This phenomenon is not demonstrable if the blindness is the result of pregeniculate lesions. Geschwind's syndrome refers to personality changes proposed to be due to disconnection of brain areas noted in those with temporal lobe epilepsy. The Charcot–Wilbrand syndrome, or irremembrance, is characterized by the inability to generate an internal mental image or revisualize (imagine) an object. The patients have more difficulty in generating objects through drawing than in copying model figures. It is usually secondary to bilateral parietal lobe lesions. Central achromatopsia refers to loss of colour vision due to occipital lobe lesions.

Cummings JL and Mega MS. *Neuropsychiatry and Behavioural Neuroscience*. Oxford University Press, 2003, p. 123.

15.A. Ideational apraxia (IDA) is an inability to correctly sequence a series of acts that lead to a goal. Asking the patient to carry out a multistep, sequential task, such as preparing a sandwich for work, is a good test of IDA. It is most often associated with degenerative dementia and delirium. Ideomotor apraxia is probably the most common type of apraxia. Patients with ideomotor apraxia make spatial and temporal errors when performing learned, skilled movements including pantomimes, imitations, and using actual objects. When pantomiming the use of a screwdriver, patients with ideomotor apraxia may rotate their arm at the shoulder and fix their elbow. In right-handed individuals ideomotor apraxia is almost always associated with left-hemisphere lesions. A variety of structures, including the corpus callosum, the inferior parietal lobe, and the premotor areas, may be involved. Patients with ideomotor apraxia can imitate actions of others (using tools/objects) but have difficulty pantomiming (in the absence of tools/objects). In patients with conduction apraxia, imitation is worse than pantomiming. The site of the lesion has not been localized (unlike conduction aphasia). Patients with conceptual apraxia make tool-selection errors.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 402.

16.D. Limb-kinetic apraxia most often occurs in the limb contralateral to a hemispheric lesion, usually to the premotor cortex. Patients with limb-kinetic apraxia demonstrate a loss of deftness and ability to make finely graded, precise, independent finger movements. These subjects will not be able to use a pincher grasp to pick up a penny. They will have trouble rotating a coin between the thumb, middle finger, and little finger.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 402.

17.A. The term agnosia was originally introduced by Freud. In general, patients with agnosia have clinical feature of impaired recognition of sensory stimuli despite normal sensory pathways. Agnosia represents a disorder of higher-order sensory processing. There is an impaired ability to recognize the nature or meaning of sensory stimuli. This is usually modality specific. There are two basic categories of agnosia. Apperceptive agnosia involves impaired generation of the minimal integrated percept necessary for meaningful recognition. This defect, leads to the formation of an inadequate minimal object recognition unit (i.e. the minimum information required to meaningfully interpret the percept). For example, a "pencil" is initially perceived as—"long, thin, pointed at one end, etc", before a meaning ("it is a pencil—it is used to write") is attributed to the percept. Patients are unable to distinguish visual shapes and so have trouble recognizing, copying, or discriminating between different visual stimuli. Associative agnosia involves defective association of meaning with percepts. The defect is in associating a correctly perceived percept with its meaning. Patients can describe visual scenes and classes of objects but still fail to recognize them. Patients suffering from associative agnosia are still able to reproduce an image through copying. Anosognosia refers to being unaware of a neurological state/illness. Abulia refers to loss of drive or motivation seen in cingulate lesions.

Goldstein MA. and Silverman ME. Neuropsychiatric assessment. *Psychiatric Clinics of North America* 2005; **28**: 530.

18.B. Since this person has a difficulty in recognizing faces, he is suffering from prosopagnosia. In this situation, he can differentiate between faces. So, the defect is probably at a step after the formation of the minimal recognition unit (described in the previous question), but at the step where the percept (in this case the face) is associated with a meaning ('whose face it is'). So this patient is most probably suffering from associative prosopagnosia.

Goldstein MA. and Silverman ME. Neuropsychiatric assessment. *Psychiatric Clinics of North America* 2005; **28**: 534.

19. C. Memories of specific experiences formed in specific contexts are called episodic, for example the meal one had 3 weeks ago at a restaurant. Episodic memory is explicit, that is it is consciously acquired (we know how and where we acquire it) and declarative, that is it can be consciously recalled. Episodic memory depends largely on the integrity of the medial temporal lobe, but there are other structures that are involved in episodic memory. These include the frontal lobe, basal forebrain, retrosplenial cortex, presubiculum, fornix, mammillary bodies, mammillothalamic tract, anterior nucleus of the thalamus, etc. Damage to any one of these structures can result in deficits in episodic memory. Hence episodic memory loss cannot be said to be characteristic of a medial temporal lesion. Episodic memory impairment could manifest as anterograde or retrograde amnesia. Anterograde amnesia refers to impairment in new memory formation and retrograde amnesia refers to the loss of previously acquired memories. Episodic memory applies to both personal and public events. In most dementias, semantic memory loss occurs at later stages than episodic memory loss.

Budson AE and Price BH. Memory dysfunction. *New England Journal of Medicine* 2005; **352**: 692–699.

20. C. Semantic memory describes memories for general information which is unrelated to other information, for example dates in history, the colour of our national flag, or the characteristics of different species of dinosaurs (encyclopaedic facts). Semantic memory is explicit and declarative (see explanation to the previous question). In the most general sense, semantic memory refers to all of our knowledge of the world; however, semantic memory is more usually tested in the context of naming and categorization tasks. It is localized to the inferior lateral temporal lobes. The frontal lobes are responsible for providing information to, and retrieving information out of, the semantic memory banks.

Budson AE and Price BH. Memory dysfunction. *New England Journal of Medicine* 2005; **352**: 692–699.

21. E. The woman described in the question probably suffers from dissociative amnesia, in this case precipitated by the stress of separation. Systematized amnesia is the loss of memory for a certain category of information such as material relating to one's family or a particular person. In this case, her boy friend. Localized amnesia is the condition where the individual fails to recall events that occurred during a circumscribed period of time. In selective amnesia the person can recall some but not all events during a circumscribed period of time. Generalized amnesia is characterized by a failure to recall all of a person's past life. There may be dissociation between explicit and implicit memory, for example the person may retain all his learned skills, but completely forget who he is or his past (a la Jason Bourne in the Bourne trilogy). Continuous amnesia is a condition featuring an inability to recall events subsequent to a specific time up to and including the present.

Cummings JL and Mega MS. *Neuropsychiatry and Behavioural Neuroscience*. Oxford University Press, 2003, p. 334.

22. D. Working memory describes the ability to temporarily hold information in mind and manipulate it as required by circumstances, for example doing mental arithmetic. It may be phonological, such as keeping a phone number in mind for as long as it takes to dial or visuospatial, such as following a mental map while cycling to work. Baddeley described a central executive system in working memory, which is central to manipulation of the data held in the 'phonological loop' or the 'visuospatial sketchpad'. In short, working memory is what allows us to mentally add up the cost of the number of pints of lager we had at the pub, subtract the total from the value of the money we give the bar tender, and calculate the change that is due to us. Prefrontal cortex is the most important structure for working memory, due to the extensive role played by the central executive; other structures involved include posterior parietal cortices. Disturbances of working memory can result in anterograde disturbances to other systems of memory as well, because intact working memory is generally required for the encoding of information. Episodic memory may be particularly affected.

Budson AE and Price BH. Memory dysfunction. *New England Journal of Medicine* 2005; **352**: 692–699.

23. E. Procedural memory describes the ability to learn and perform tasks without conscious thought. This is disturbed in conditions that involve subcortical basal ganglia structures such as Parkinson's disease, Huntington's disease, progressive supranuclear palsy, and olivopontocerebellar degeneration. Procedural memory deficits may also be found in depression and OCD. In conditions such as Alzheimer's disease, mild cognitive impairment, Lewy body dementia, vascular dementia, the frontal variant of frontotemporal dementia, encephalitis, Korsakoff's syndrome, traumatic brain injury, hypoxic–ischaemic brain injury (including cardiac bypass surgeries), temporal lobe surgery, seizures, vitamin B₁₂ deficiency, hypoglycaemia, transient global amnesia, and multiple sclerosis, episodic memory is more likely to be impaired. Mood, anxiety, and psychotic disorders may also show episodic memory disturbances. Finally, episodic memory impairment may be a side-effect of treatment with anticholinergic drugs and ECT. Semantic memory may be disturbed in conditions such as Alzheimer's disease, the temporal variant of frontotemporal dementia, traumatic brain injury, and encephalitis. Working memory is disturbed in most of the conditions listed above. Working memory is also impaired in anxiety, depression, schizophrenia, OCD, ADHD, other psychiatric states, and medications. Finally, impairments in working memory occur as part of normal ageing.

Budson AE and Price BH. Memory dysfunction. *New England Journal of Medicine* 2005; **352**: 692–699.

24. E. The condition described is Wernicke–Korsakoff syndrome. Although the common cause for the syndrome is malnutrition secondary to alcohol use, a number of other conditions including hyperemesis during pregnancy, gastrectomy, pyloric stenosis, etc. are associated. In addition to difficulty learning new information, patients with Korsakoff's syndrome usually have a retrograde amnesia which could extend back up to several years prior to the onset of the syndrome. Patients usually remain amnesic for 1–3 months after onset and then begin to recover gradually over a 10-month period; 25% recover completely and 25% have no demonstrable recovery. CT scan may reveal bilateral hypodense areas in the medial thalamus in patients with acute Wernicke's encephalopathy, and mamillary body atrophy may be demonstrated by MRI in some patients with chronic Korsakoff's syndrome. Confabulation is common during the early phases of Korsakoff's syndrome but is unusual in the chronic phase of the condition. Administration of thiamine during the acute Wernicke's phase may prevent emergence of Korsakoff's syndrome. Once the memory defect is established, however, thiamine has little effect except to prevent further deterioration.

Cummings JL and Mega MS. *Neuropsychiatry and Behavioural Neuroscience*. Oxford University Press, 2003, p. 100.

25.A. There are several clinical indicators that predict severity of a head injury. They include duration of retrograde amnesia, the depth of unconsciousness as assessed by the worst score on the Glasgow Coma Scale (GCS), the duration of coma, neurological evidence of cerebral injury, using an MRI or EEG, and the duration of post-traumatic amnesia. Of these, the least useful clinical indicator is the duration of retrograde amnesia. Duration of post-traumatic amnesia is the best marker of outcome. Patients with a post-traumatic amnesia of less than 1 week will have minimal disability, while duration of more than 1 month is suggestive of enduring and significant disability. Other predictors of a bad outcome include previous head injury, older age, APOE e4 status, and alcohol dependence. Head injury can be classified as mild wherein a GCS score of 13 to 15 is likely to be associated with only a short duration of loss of consciousness (less than 20 minutes) and a short post-traumatic amnesia (less than 24 hours). In moderate head injury, GCS score 9 to 12 is likely to be associated with loss of consciousness of more than a few minutes but less than 24 hours and a post-traumatic amnesia of more than 1 day but less than 1 week. In severe head injury, a GCS score 3 to 8 is likely to be associated with a loss of consciousness of more than 1 day or a post-traumatic amnesia of more than 1 week.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 441.

26. B. The term post-concussion syndrome (PCS) is used to describe a cluster of symptoms that results in severe disability following mild head injury. There is no consistent relationship between the prevalence of PCS and the severity of head injury. Sometimes a similar constellation of symptoms may be seen in moderate and severe injury, where it is more likely to be attributed to the actual brain damage. Symptoms are usually vague, but early symptoms may include neurological complaints such as diplopia, dizziness, etc. Additional symptoms include cognitive impairment, fatigue, anxiety, depression, and irritability. In general, most neurological symptoms will have resolved by 2 to 6 months. Several observations support an organic basis, for example diffuse microscopic axonal injury on post mortem, macroscopic brain lesions evident in 8–10% of individuals on CT scan, subtle abnormalities on EEG, etc. Psychosocial factors play a part in the syndrome, especially in those lasting longer than 1 year. This is greatest in those with very mild head injuries and very chronic symptoms. There is an association between severity of post-concussion symptoms and seeking compensation, but very few improve even after the compensation.

King NS. The post concussion syndrome: Clarity amid the controversy? *British Journal of Psychiatry* 2003; **183**: 276–278.

27. E. Anticonvulsants are not indicated at this point in time, especially since the patient has no symptoms suggestive of seizures. About 2 to 5% of all patients with mild, closed head injury tend to develop long-term seizure disorder. This rises to about 10 to 20% in patients with severe, closed head injury. A higher incidence of seizures has been seen in patients with depressed skull fractures (15%), haematomas (30%), and penetrating brain wounds (50%). Early seizures, within the first week, are relatively benign and are only weak predictors of later epilepsy. This patient has a mild, closed injury, and he is at a low risk for developing seizures, despite positive family history. Randomized controlled studies have shown that the use of anticonvulsants does not prevent the development of post-traumatic epilepsy beyond the first week after injury. There is a limited role for genetic predisposition in developing post-traumatic epilepsy. Those with the ApoE-e4 allele may be at higher risk for post-traumatic epilepsy.

Frey LC. Epidemiology of posttraumatic epilepsy: a critical review. *Epilepsia* 2003; **44** (s10): 11–17.

28. D. This patient is most probably suffering from multiple sclerosis. The lifetime prevalence of major depression in multiple sclerosis (MS) is around 50%. It is three to 10 times the rate in the general population. Suicidal intent occurs in up to 30% of MS patients. This is linked to the presence and severity of depression and degree of social isolation. Suicide rates in MS patients are up to seven times higher than rates in the general population. Depression and suicide rates are higher in MS than in most other neurologic disorders. In MS patients, the lifetime prevalence of bipolar affective disorder is twice the prevalence in the general population. Pathological laughing and crying is a syndrome that presents with inappropriate laughter without associated happiness and inappropriate tears without associated sadness. Approximately 10% of MS patients are affected, with varying degrees of severity. ECT is generally well tolerated by patients with MS, but carries a risk of neurological relapse and exacerbation of the illness.

Feinstein A. The neuropsychiatry of multiple sclerosis. *Canadian Journal of Psychiatry* 2004; **49**: 157–163.

29. C. Around 50% of patients with MS have cognitive deficits. Aphasia, apraxia, and agnosia, which are characteristic of predominantly cortical diseases, are generally absent in MS, where pathology is largely confined to subcortical white matter. Although patients with long-lasting and advanced physical disability may also have severe cognitive impairment, the correlation between cognitive dysfunction and disease characteristics (type and duration of MS) is usually weak or modest. Cognitive deficits are also independent of mood symptoms in MS. Deficits in working, semantic, and episodic memories have been reported. MS patients have difficulty both in acquiring and in retrieving information (although performance on recognition tests is better than recall). Procedural memory is usually unaffected. Impaired attention and slowness of thinking is another feature of MS. Frontal lobe deficits may take the form of deficits in conceptualization and abstract thinking. At least one study has shown that donepezil is effective in improving cognitive deficits in MS.

Jefferies K. The neuropsychiatry of multiple sclerosis. *Advances in Psychiatric Treatment* 2006; **12**: 214–220.

30. D. Pathological laughter and crying is a symptom seen in MS, where approximately 10% of MS patients are affected, with varying degrees of severity. This is similar to descriptions of the pseudobulbar affect, although this symptom can be present without pseudobulbar palsy. Patients are more likely to have frontally mediated cognitive deficits. Commonly used scales to identify and characterize this syndrome include the Pathological Laughter and Crying Scale and the Centre for Neurologic Study–Lability Scale. The most common differential diagnosis is a mood disorder, but patients with pathological crying exhibit the emotional display in the absence of a pervasive and sustained elation or depressed mood. But when mood disorder and pathological laughter and crying coexist, differentiation can be very difficult. TCAs and SSRIs have been found to be effective in the treatment even if no depression is noted.

Parvizi J, Arciniegas DB, Bernardini GL et al. Diagnosis and management of pathological laughter and crying. *Mayo Clinic Proceedings* 2006; **81**: 1482–1486.

31. B. Epilepsy is a common disorder, affecting approximately 1% of the population and may involve individuals of any age. Seizures are convulsions that may be produced by a wide variety of events, including alcohol and drug withdrawal syndromes, hypoglycaemia, transient cerebral anoxia, and epileptic syndromes. Epilepsies are characterized by recurrent seizures and their classification is based on seizure type, age of onset, intellectual development, findings on neurological examination, and results of neuroimaging studies. Seizures are broadly classified into partial and general forms. Partial seizures are further divided into simple and complex. In simple partial seizures consciousness is preserved; complex seizures are characterized by disturbances in consciousness. Partial seizures pertain to one half or one particular area of the brain. Generalized seizures involve both hemispheres from the beginning of the seizure but, at times, they may be secondary to spread from a partial seizure. Tonic-clonic seizures and absence seizures are examples of primary generalized seizures. They are usually associated with a loss of conscious awareness.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 275.

32. D. Left-sided foci are associated with an increased risk of depression and right-sided foci with an increased risk of mania. Mood disorders are the most common type of psychopathology encountered in patients with epilepsy. Prevalence rates of depression range from 30 to 50% in patients with epilepsy. With intractable disorders, up to 60% have lifetime histories of depressive syndromes. In contrast to the incidence of depression in epilepsy, the incidence of mania and bipolar disorder are at normal or near-normal levels. Some retrospective chart reviews state a lifetime prevalence of 20%. The incidence of suicide in epilepsy patients is five to 10-fold greater than in the general population. In those with temporal lobe epilepsy, suicide rates are around 25 times that of the general population.

Schwartz JM and Marsh L. The psychiatric perspectives of epilepsy. *Psychosomatics* 2000; **41**: 31–38.

33. B. Geschwind's syndrome is an eponymous syndrome of interictal behaviour/personality disorder which has been described in temporal lobe epilepsy (TLE). Clinical features of this syndrome include preoccupation with philosophical and religious concerns, anger, excessive emotionality, viscosity (noted especially in speech), circumstantiality, altered sexuality, and hypergraphia. Recent reviews state that personality traits, rather than a personality disorder per se, seems more likely in these disorders and they tend to resemble the cluster C category of disorders in DSM-IV.

Marcangelo MJ and Osvies F. Psychiatric aspects of epilepsy. *Psychiatric Clinics of North America* 2007; **30**: 781–802.

Swinkels WAM, Kuyka J, Dyckb R, and Spinshoven P. Psychiatric comorbidity in epilepsy. *Epilepsy and Behavior* 2005; **7**: 37–50.

34. E. Psychogenic non-epileptic seizures were previously referred to as ‘pseudoseizures’. They are seizure-like behavioural events that occur in the absence of abnormal electrical discharge in the brain. The gold standard for diagnosis is video-EEG monitoring. People who present with non-epileptic seizures commonly have comorbid epilepsy. Nearly 30 to 50% of patients who have non-epileptic seizures have epilepsy and 20 to 60% of patients who have epilepsy have non-epileptic seizures. The average age of onset is between 20 and 30 years and it is three times more common in women than men. Prevalence rates of a history of sexual abuse in non-epileptic seizures range from 25 to 75%. An elevated prolactin level (usually two times baseline or three standard deviations above normal) could be due to seizures or any neurological event, such as syncope. Some patients with pseudoseizures may have modest elevations in prolactin levels. A normal prolactin may not always be diagnostic of pseudoseizures, since it is frequently normal in partial seizures and sampling may be mistimed following convulsions.

Marcangelo MJ and Osvies F. *Psychiatric aspects of epilepsy*. *Psychiatric Clinics of North America* 2007; **30**: 781–802.

35. C. Historically, left anterior stroke has been associated with depression. This has been questioned in more recent times—including a few meta-analyses that did not show such a relationship. The laterality hypothesis of poststroke depression may hold true only in the acute stage of illness of less than 2 months’ duration. As time passes, the chance of getting a depressive episode is equal in all kinds of stroke. Major depression occurs in approximately 10–25% of patients. Anxiety occurs without depression in up to 10%. Apathy occurs in 20% of patients. Anosognosia with denial of illness is present in 25–45% of patients, particularly those with right posterior lesions. Catastrophic reactions appear in approximately 20% and emotional lability is present in 20%. The mean duration of major depression appears to be about 9 months, but can be chronic, lasting for years in hospitalized patients.

Chemerinski E and Robinson GR. *The neuropsychiatry of stroke*. *Psychosomatics* 2000; **41**: 5–14.

36. C. Goldstein instigated the term ‘catastrophic reaction’ to describe a cluster of symptoms characterized by aggressive outbursts in patients with brain injury. It was ascribed to the inability of the person to cope with the physical/cognitive deficit. An important study with respect to catastrophic reaction was conducted by Starkstein et al. in 1993. The major findings of this study are as follows. Catastrophic reaction occurs in around 20% of stroke patients. It is associated with a personal and family history of psychiatric illness. It is also significantly associated with the presence of poststroke depression. It is more common in anterior subcortical lesions and lesions involving the basal ganglia. The reaction is not merely a frustration reaction to the presence of aphasia or cognitive deficits; it could be present as a symptom on its own or as a behavioural symptom in a subgroup of depressed patients with anterior subcortical damage.

Starkstein SE, Fedoroff JP, Price TR et al. Catastrophic reaction after cerebrovascular lesions: frequency, correlates, and validation of a scale. *Journal of Neuropsychiatry and Clinical Neuroscience* 1993; **5**: 189–194.

37. B. On the basis of the fact that not all patients with a left anterior or a right posterior lesion develop depression, other premorbid factors were studied by Starkstein et al. Along with the presence of family history of affective disorders in those who developed poststroke depression, they also found that there was no significant relationship between the presence of depression and demographic variables such as age, sex, education, socioeconomic status, etc. Presence of premorbid cortical atrophy was found to be a risk factor for depression. Similarly, cortical atrophy also predicts mania.

Starkstein SE, Robinson RG, and Price TR. Comparison of patients with and without poststroke major depression matched for size and location of lesion. *Archives of General Psychiatry* 1983; **45**: 247–252.

38.B. The middle cerebral artery supplies most of the cortical grey matter, including the parietal cortex. The inferior parietal lobe includes the upper part of the optic radiation which carries fibres from upper half of the retina and hence lesions of this area produce inferior quadrantanopia. Parietal lobe damage also explains the hemineglect, mild hemiparesis, and dressing apraxia. Carotid artery syndrome usually presents with amaurosis fugax, the feature distinguishing it from the middle cerebral artery syndrome. Amaurosis fugax is transient, painless monocular blindness, usually due to emboli either from the large arteries or the heart itself. Occlusions of the coronaries usually occur at the bifurcation of the common carotid.

Kasper DL et al., eds. *Harrison's Principles of Internal Medicine*, 16th edn. McGraw-Hill, 2005, p. 2381.

39.D. Stage 4 NREM sleep is characterized by more than 50% delta activity. When the delta activity ranges from 20 to 50%, the person is in stage 3 NREM sleep. K complexes and sleep spindles along with delta waves of less than 20% is noted in stage 2. Stage 2 is also the longest sleep stage through the night, comprising almost 50% of adult sleep. Stage 1 is characterized by gradual slowing of the alpha wave (less than 50% alpha activity). This is the sleep onset. Stage W (wakefulness) is characterized by predominantly alpha waves posteriorly with low voltage mixed frequency beta waves anteriorly. REM sleep constitutes around 20–25%. Normally, much less time is spent in stage W and stage 1.

Hales RE and Yudofsky SC, eds. *The American Psychiatric Publishing Textbook of Neuropsychiatry and Clinical Neurosciences*, 4th edn. American Psychiatric Press, 2002, p. 698.

40.A. Characteristics of REM sleep include variable heart and breathing rate, high oxygen consumption and cerebral blood flow, penile erections (morning erections due to high levels of REMs), increased vaginal blood flow and uterine activity, absent electrodermal activity, poikilothermic state, and dream-like mental activity. In contrast, NREM sleep is characterized by regular, slow heart and breathing rate, low cerebral blood flow and O₂ consumption, absent penile blood flow, and thought-like mental activity. Muscular tone is maintained in NREM sleep and atonia is seen in REM.

Hales RE and Yudofsky SC, eds. *The American Psychiatric Publishing Textbook of Neuropsychiatry and Clinical Neurosciences*, 4th edn. American Psychiatric Press, 2002, p. 699.

41.A. Sleep terrors occur in slow-wave sleep (stage 3 and 4) unlike nightmares which occur in REM sleep. Sleep terrors are characterized by a sudden arousal with intense fearfulness, often associated with a sharp scream. The subject may sit up in bed, may vocalize unintelligibly, and waking the individual leads to confusion. There is amnesia for the episode and unlike nightmares it is very rarely associated with vividly recalled dreams and images. A familial pattern has been reported. In children, night terrors may be transient but in adults they may be associated with other psychopathology.

Hales RE and Yudofsky SC, eds. *The American Psychiatric Publishing Textbook of Neuropsychiatry and Clinical Neurosciences*, 4th edn. American Psychiatric Press, 2002, p. 717.

42. D. This patient is likely to have narcolepsy. Narcolepsy is a disorder of unknown aetiology. It consists of the tetrad of excessive day time sleepiness, cataplexy, sleep paralysis, and hypnagogic hallucinations. Polysomnography typically shows sleep-onset REM stage. Cataplexy refers to sudden loss of muscular tone, often seen in association with emotional reactions in those with narcolepsy. An abnormality in the hypocretin neurones in the lateral hypothalamus has been noted in those with narcolepsy. Hypocretin (orexin) is a highly excitatory peptide hormone secreted from the hypothalamus. This is necessary to maintain wakefulness and it also increases appetite. Narcolepsy, especially cataplexy, is considered to be a hypocretin deficiency syndrome. SSRIs and TCAs remain the treatment of choice currently. Modafinil is also being tried as a treatment.

Siegel JM, Moore R, Thannickal T, and Nienhuis R. A brief history of hypocretin/orexin and narcolepsy. *Neuropsychopharmacology* 2001; **25**: S14–S20.

43. D. Dementia is estimated to occur in 27% of patients with Parkinson's disease (PD). Dementia has been associated with older age, greater PD severity, hallucinations, longer duration of PD, greater disability, and male gender. Causes of dementia in PD include Lewy body pathology, dopamine depletion, coexisting AD, and other conditions. Reduced fluorodopa uptake in the frontal cortex and caudate nucleus, and in mesolimbic pathways are predictors of cognitive impairment. Temporoparietal cortical hypometabolism also predicts cognitive impairment. Donepezil has been found to be useful in two separate double-blind trials in patients with PD.

Lauterbach CE. The neuropsychiatry of Parkinson's disease and related disorders. *Psychiatric Clinics of North America* 2004; **27**: 801–825.

44. C. Progressive supranuclear palsy is considered as a Parkinson plus syndrome. It is distinguished from Parkinson's disease by the presence of early broad-based and stiff gait disorder (axial greater than limb rigidity in extension) with backward falls, and supranuclear gaze palsy with slow vertical saccades and difficulty looking down (and hence the falls). Falls are very common in these patients and are an important cause of morbidity. Patients are prone to develop various psychiatric complications, including cognitive dysfunction and mood disorders. Cholinesterase inhibitors have not been particularly useful in treating patients with progressive supranuclear palsy associated dementia. Other Parkinson plus syndromes include multisystem atrophy (called Shy–Drager syndrome when associated with autonomic failure), olivopontocerebellar atrophy, and corticobasal degeneration.

Lauterbach CE. The neuropsychiatry of Parkinson's disease and related disorders. *Psychiatric Clinics of North America* 2004; **27**: 801–825.

45. C. In this case the origin of emboli must be at the internal carotid artery. The ophthalmic artery, a branch of the internal carotid artery, is blocked transiently, producing the symptoms described in the question. This is called as amaurosis fugax which translates to 'fleeting darkness'. It is related to transient but sudden monocular visual loss as a result of decreased retinal circulation. It is a type of transient ischaemic attack and could be a harbinger of a cerebrovascular accident. Compromise of posterior circulation usually leads to cortical blindness, often with macular sparing.

Darby D and Walsh K. *Neuropsychology: A Clinical Approach*, 5th edn. Elsevier, 2005, p. 84.

46. A. The given history is consistent with dissociative fugue. Fugue states are associated with stressful life events wherein total amnesia for the recent past can be seen. More often the amnesia related to dissociation is circumscribed to events of personal importance. During the fugue, the patient may retain normal functional activities and may even learn new verbal and non-verbal materials. Following recovery from the fugue, one may not remember the activities carried out during the fugue state.

Darby D and Walsh K. *Neuropsychology: A Clinical Approach*, 5th edn. Elsevier, 2005, p. 101.

47.C. This is an example of utilization behaviour. A patient with utilization behaviour will be forced to 'utilize' objects presented to him despite the absence of obvious need for such usage. An extreme form of this is seen in 'environmental dependence syndrome'—the patient becomes compelled to make use of all that is seen in his immediate environment resulting in an array of serial complex behaviour. Klüver–Bucy syndrome occurs in the context of bilateral temporal lobe damage. It is associated with hyperorality, inappropriate sexuality, and increased exploratory behaviour (hypermetamorphosis). Alien hand syndrome refers to loss of control of limb movements resulting in 'automatic' coordinated hand movements. The patient is usually aware of this and may try to exercise control using the other hand. Balint's syndrome is characterized by oculomotor apraxia, optic ataxia, and simultanagnosia.

Darby D and Walsh K. *Neuropsychology: A Clinical Approach*, 5th edn. Elsevier, 2005, p. 132.

48.A. Utilization behaviour is seen in patients with frontal lobe damage. Dominant parietal lobe lesions result in apraxia, right–left confusion, acalculia, and finger agnosia. Balint's syndrome occurs in bilateral parieto-occipital damage.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 391.

49.D. Temporal lobe is the most common site of origin of complex partial seizures; in very few cases parietal focus has been demonstrated. When accompanied by hallucinations, intense emotional reactions may be seen during the seizure. Fear is the most common emotion noted. Curiously, patients are often aware of the unreal nature of their hallucinatory experiences, but this awareness is not specific to complex seizures. Pathology of familiarity characterized by *déjà vu* and *jamais vu* are commonly reported in temporal lobe epilepsy.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 277.

50.B. Progressive fluent aphasia early in the course of a dementing illness is a feature of semantic dementia. Semantic dementia is a type of frontotemporal degenerative disorder. The pathological finding is predominantly frontotemporal degeneration with ubiquitin inclusions. Motor neurone disease type inclusions may also be noted. Semantic memory refers to representation of meanings, understanding concepts, and knowledge unrelated to temporal events (cf. episodic memory). Focal cortical deficits, especially progressive aphasia, can be presenting features of Alzheimer's disease but this is uncommon.

Alladi J, Xuereb T, Bak P et al. Focal cortical presentations of Alzheimer's disease. *Brain* 2007; **130**: 2636–2645.

51.A. The National Adult Reading Test (NART) has been widely used as a measure of premorbid IQ. The usefulness of NART as a measure of premorbid IQ is based on two assumptions:

1. Reading ability is relatively independent of brain damage.
2. Ability to read irregular words from a list is a strong predictor of intelligence in the normal population.

Hence in those with brain damage, irrespective of the diagnosis, NART can be used to estimate the most probable IQ level before becoming ill. However, the notion that the NART score is relatively independent of brain damage has come under scrutiny of late. Studies in Alzheimer's dementia and Korsakoff's syndrome have indicated deterioration in reading ability, leading to an underestimated premorbid IQ.

Bright P, Jaldow E, and Kopelman MD. The National Adult Reading Test as a measure of premorbid intelligence: A comparison with estimates derived from demographic variables. *Journal of the International Neuropsychological Society* 2002; **8**: 847–854.

52. D. This history is consistent with transient global amnesia (TGA). Sudden-onset amnesia with inability to form new memories of current events and a variable degree of retrograde amnesia is seen. The entire episode lasts for hours to days and on recovery the extent of retrograde amnesia shrinks and almost intact memory for events that happened before the episode is restored, but a dense amnesia persists for the events during the episode (24 hours in this case) even after full recovery. During the episode itself, the procedural memory, visuospatial functions, and problem-solving ability are intact; the patients may even be able to drive during the episode.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 379.

53. C. TGA is thought to be vascular in origin. Posterior cerebral circulation (vertebrobasilar insufficiency) is implicated, which supplies significant part of hippocampal and other medial temporal regions. Migrainous or epileptic aetiology has not been entirely disproved. Obstruction to cortical sinuses may be related to idiopathic intracranial hypertension in some cases. The middle meningeal artery may be injured in skull fractures, often becoming a source of extradural haematoma.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 379.

54. C. The anterior spinothalamic tract is supplied by the anterior spinal artery. The spinothalamic tract carries pain and temperature sensations. Posterior tracts such as dorsal columns of gracilis and cuneatus carry joint sense, light touch, proprioception, and vibration sensations. Infarction of the spinal cord usually involves the territory of the anterior spinal artery—the ventral two-thirds of the spinal cord.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 1069.

55.A. The cerebellum has an external cortical grey matter and the deep cerebellar nuclei. There are four deep nuclei: dentate, globose, emboli-form, and fastigial nuclei. Mossy fibres and climbing fibres provide the major input into the cerebellum. Substantia nigra and subthalamic nucleus are part of basal ganglia. Red nucleus is an upper brainstem nucleus seen at the level of tegmentum. Similar to substantia nigra, red nucleus also contains iron pigments. It is involved in motor coordination.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 73.

56. C. Pseudobulbar palsy is also known as spastic bulbar palsy. It usually results from bilateral frontal damage. This may be due to vascular, demyelinating, or motor neurone disease (amyotrophic lateral sclerosis). Diffuse brainstem damage (bulb) will produce lesions in the cranial nerve nuclei, causing bulbar palsy. Pseudobulbar palsy is an upper motor neurone type of lesion. Bulbar palsy produces lower motor neurone damage. Hence increased tone (producing spastic tongue), exaggerated tendon reflexes (brisk jaw jerk), and lack of fasciculations are notable. Diffuse frontal damage may produce frontal release signs. Poliomyelitis, diphtheria, and Guillain–Barré syndrome are known causes. The most common cause of progressive bulbar palsy is motor neurone disease.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 1187 and 426.

57. B. Lesions of the subthalamic nucleus are associated with hemiballismus. Lesions of the caudate nucleus are associated with chorea. Disturbances in the GABA system of caudate nucleus are noted in Huntington's disease. Similarly, damage to the caudate nucleus is implicated in Sydenham's chorea seen in streptococcal infection. Parkinsonian movement disturbances, especially bradykinesia, are associated with damage to the substantia nigra.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 61.

58. C. Set shifting is an executive function. In the Wisconsin Card Sorting Test, abstract reasoning and flexibility in problem solving are tested. In this test, cards of different colour, form, and number are available. Patients are asked to sort the cards into groups according to varying categories (colour only, form only, or number only) as requested by the examiner. This measures the capacity for abstract thinking and set-shifting ability (cognitive flexibility). Tower of London is a problem-solving test; it involves frontal and basal ganglia function but does not directly test set-shifting ability. Rey-Osterrieth figure is a test of visual memory wherein a complex geometric figure is given to be copied, followed by immediate reproduction from memory and reproduction after a delay.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 184.

59. C. Anomic (or nominal) aphasia presents with inability to name objects and body parts. Patients have fluent speech, intact repetition, intact comprehension, reading, and writing. Nominal aphasia often presents together with, or may follow, recovery from other forms of aphasia. Nominal aphasia is not very useful for lesion localization. It is also noted in early Alzheimer's disease.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 422.

60. D. The blood supply to the rostral third of the hippocampus comes from the anterior choroidal artery, which is a direct branch of the internal carotid artery. It does not take part in the circle of Willis anastomosis. The occipital two-thirds are supplied by hippocampal branches, the posteromedial choroidal artery, and the inferior temporal branches of the posterior cerebral artery.

Lüdemann W, Schneekloth C, Samii M, and Hussein S. Arterial supply of the temporo-medial region of the brain significance for preoperative vascular occlusion testing. *Surgical and Radiologic Anatomy* 2001; **23**: 39–43.

61. D. Early in the Alzheimer's disease neuronal loss is most pronounced in layer II of the entorhinal cortex of the hippocampus. The parahippocampal gyri and subiculum are also affected. This extends to anterior nuclei of the thalamus, septal nuclei, amygdala, and monoaminergic systems of the brainstem are also depleted. The cholinergic neurones of the nucleus basalis of Meynert are also reduced. In cerebral cortex, most pronounced loss occurs with respect to pyramidal neurones and astrocytic proliferation follows as a compensatory or reparative process, most prominently in layers III and V.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 901.

62.A. Excessive stimulation of glutamate receptors leads to an increase in intraneuronal calcium and nitric oxide. Calcium activates proteases that could destroy the neurone from within. Memantine is an NMDA antagonist used in the treatment of Alzheimer's disease, based on the excitotoxicity hypothesis. This mechanism may be applicable for Parkinson's disease too. In Huntington's disease, an expansion of the polyglutamine region of huntingtin takes place due to the disease-causing mutation. Hence the mutant huntingtin protein accumulates in the nuclei of neurones, preferentially in striatum and cortex. These aggregates may be directly toxic to some extent, but predominant striatal loss, as opposed to cortical loss, may be due to glutamate-mediated excitotoxicity. Huntingtin accumulation may render cells unusually sensitive to glutamate-mediated damage.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 912.

63.D. Posterior inferior cerebellar artery occlusion leads to Wallenberg's syndrome. The resulting signs and symptoms are attributed to infarction of a wedge of lateral medulla that contains vestibular nuclei, descending sympathetic tract, spinothalamic system (carrying pain and temperature from contralateral side of body), descending fifth nerve tract and nucleus, and ninth and tenth nerve fibres of same side. This leads to ipsilateral Horner's syndrome (miopsis, anhidrosis, and ptosis due to sympathetic damage), ipsilateral loss of face sensation (fifth nerve damage), dysphagia, hoarseness, loss of gag reflex (ninth/tenth nerve damage), and contralateral loss of pain and temperature over half of the body.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 679.

64.A. The age of the patient, the triad of memory difficulties, loss of balance, and urinary incontinence, and the neuroimaging findings suggest normal-pressure hydrocephalus (NPH). NPH is not a hydrocephalus in the true sense—there is no increase in intracranial pressure when lumbar puncture is carried out. Following certain meningeal insults, secondary to subarachnoid haemorrhage, head trauma, or resolved meningitis, an increase in intracranial pressure may develop but reach a stable stage where formation of CSF diminishes and equilibrates with absorption, which increases proportionate to the pressure. Once this equilibrium is reached there must be a gradual fall in pressure, although at a high normal level. In some patients, this high normal intracranial pressure of 150 to 200 mm H₂O leads to manifestation of NPH.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 535.

65.B. The presence of low heart rate, muscle tone, and blood pressure is suggestive of NREM sleep. At this stage of sleep if a person is awakened, he will be confused. He may not recollect the instance of awakening in the morning. A normal adult spends nearly 75% of sleep in various NREM stages, while the remaining 25% is REM sleep. Penile erection, high cerebral blood flow, and vividly recalled dreams are features of REM stage.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 335.

66. B. Alpha, beta, delta, and theta are four important wavelets in EEG when awake. Alpha waves are predominant, especially posteriorly when the eyes are closed; they occur at a frequency of 8 to 13 Hz. Beta waves are sometimes seen in normal EEG over central, anterior regions; they occur at a frequency higher than 13 Hz. Theta activity is seen infrequently when awake but often when a subject is drowsy or sleeping. Excessive theta when awake is abnormal. Delta waves (frequency less than 3.5 Hz) are normally seen only in deep sleep and are pathological if noted in adult waking EEG. With ageing, slow waves become more common in EEG.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 118.

67.A. Huntington's disease is characterized by diffuse flattening or loss of alpha waves in EEG. In a study conducted in a group of 95 patients with Huntington's chorea, 31 showed little activity of any kind (flat trace EEG) and in particular no alpha rhythm above 10 µV in amplitude was seen. There was a statistically significant association between cortical atrophy, especially the frontal lobe, and a 'low voltage' EEG in the same study. Such low-voltage records, though not specific for Huntington's chorea, are rare in other neurological disorders.

Scott DF, Heathfield KVG, Toone B, and Margerison JH. The EEG in Huntington's chorea: a clinical and neuropathological study. *Journal of Neurology, Neurosurgery and Psychiatry* 1972; **35**: 97–102.

68. E. Two types of cannabinoid receptors, central (CB1) and peripheral (CB2), have been identified. Both receptors bind to exogenously administered tetrahydrocannabinol (THC), present in marijuana. Anandamide (from the Sanskrit word 'ananda' for bliss) is chemically N-arachidonoyl ethanolamine (arachidonic acid and ethanolamine derivative). It is a weak endogenous cannabinoid ligand. 2-arachnidonylglycerol is a strong endogenous ligand for the cannabinoid receptor. Endogenous cannabinoids exhibit intraocular pressure-lowering effects. They also decrease motor activity level and relieve pain. Anandamides are demonstrated in the thalamus, with a putative role in pain-related neurotransmission.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 110.

69. D. Bitemporal hemianopia is secondary to chiasmatic lesions. Pituitary tumours characteristically cause bitemporal hemianopia. Craniopharyngioma is a benign epithelioid tumour arising from remnants of Rathke's pouch at the junction of the infundibular stem and pituitary. It lies above the sella turcica and so exerts pressure effects on the optic chiasm leading to bitemporal hemianopia. Tunnel vision is a result of extensive peripheral field defects. Quadrantanopias usually result from damage to the optic radiation beyond the chiasma. Parietal lesions result in inferior, while temporal lesions result in superior, quadrantanopia.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 574.

70. C. Priapism is defined as a persistent penile erection greater than 4 hours in duration, which is unrelated to sexual stimulation or desire. Roughly 40 to 50% of patients who develop priapism become impotent, even after surgical treatment. Drug-induced priapism accounts for 15–40% of all cases. Psychotropics associated with priapism include trazodone, phenothiazines, butyrophenones, risperidone, and clozapine. Priapism results from decreased venous outflow from the corpora cavernosa of the penis. This can be caused by obstruction of the venous system, for example by blood dyscrasias such as sickle cell anaemia or by blocking the sympathetically mediated (α_1 receptor) detumescence. Hence the ability of a drug to block α_1 receptors correlates with its risk of priapism. This is especially true if the antiadrenergic effect is unopposed by an equally strong anticholinergic effect. Sympathetic tone is related to detumescence while parasympathetic tone is related to erection. For drugs with combined antiadrenergic and anticholinergic activity, when antiadrenergic activity negates detumescence, the anticholinergic activity will negate erection and so priapism will be rare.

Heckers S, Anick D, Boverman JF, and Stern TA. Priapism following olanzapine administration in a patient with multiple sclerosis. *Psychosomatics* 1998; **39**: 288–290.

71. B. Metacognition refers to one's knowledge concerning one's own cognitive processes and products of such processes. Metacognition is predominantly a function of prefrontal cortex. Prefrontal damage leads to overestimation of abilities, lack of awareness of deficits, and inability to use feedback to change behaviour.

Fernandez-Duque D, Baird J, and Posner MI. Executive attention and metacognitive regulation. *Consciousness and Cognition* 2000; **9**: 288–307.

72.A. 'N back' test is a popular experimental paradigm for functional neuroimaging studies of working memory. In this test subjects are asked to monitor a series of verbal or non-verbal stimuli and to indicate when the currently presented stimulus is the same as the one presented n trials previously. Using quantitative meta-analysis technique of normative functional imaging studies, a broadly consistent activation of frontal and parietal cortical regions by various versions of the n-back working memory paradigm has been demonstrated.

Owen AM, McMillan KM, Laird AR, and Bullmore E. N-back working memory paradigm: a meta-analysis of normative functional neuroimaging studies. *Human Brain Mapping* 2005; **25**: 46–59.

73. B. MPTP occurred as an impurity when illicit synthesis of opioids was attempted by a chemistry graduate student. He developed acute parkinsonian disease. Following detailed investigations, animal models of Parkinson's disease have been developed using MPTP as a neurotoxin. VMA is a metabolite of epinephrine; 5HIAA is a metabolite of serotonin. MDMA is the chemical name for ecstasy. Ketamine is a dissociative anaesthetic that stimulates sigma receptors in brain. It is being increasingly used as a street drug.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 10.

74. D. Human neocortex consists of a six-layered laminar structure. This cytoarchitectural division has been largely adapted from Brodmann's pioneering work. These six layers are numbered from the top, that is the pial surface to the underlying white matter. In order, these are:

1. Molecular (or plexiform)
2. External granular layer
3. External pyramidal
4. Internal granular
5. Internal pyramidal (or ganglionic)
6. Multiform (or fusiform) layer.

The layers vary mostly in the size and density of pyramidal and stellate cells.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 11.

75. E. Lateral geniculate nucleus is the junction where axons of retinal ganglion cells terminate after passing through uninterrupted via the optic nerve, optic chiasm, and optic tract. The medial geniculate body is involved in auditory processing.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 12.

76. D. Granule cells are the only excitatory neurones in the cerebellum. The cerebellar cortex is a three-layered structure with the outermost layer containing two types of inhibitory neurones, the stellate cells and basket cells. The middle layer has cell bodies of Purkinje cells (main output) which are GABA-mediated and so are inhibitory in function. The innermost layer contains granule cells, which are excitatory, and Golgi cells, which are inhibitory.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 17.

77.A. Working memory can be tested using digit span tasks. Using digit repetition forward, a patient's working memory capacity can be tested. Usually, a list of numbers (in no specific pattern) is read aloud by the examiner and the patient is asked to repeat it immediately in same order (forward span) or reverse order (backward span). Gradually, the length of the numeric string is increased. Consistent error at a particular length is an indication for test termination. The normal forward digit span is 7 ± 2 for most adults. Backward span is more difficult and averages around 5 ± 2 .

Conklin HM, Curtis CE, Katsanis J, and Iacono WG. Verbal working memory impairment in schizophrenia patients and their first-degree relatives: evidence from the Digit Span Task. *American Journal of Psychiatry* 2000; **157**: 275–277.

78. C. Sensory ataxia is due to posterior column disease, resulting from spinal cord lesions. In this condition, loss of joint position sense and loss of tendon reflexes are seen. In cerebellar ataxia, associated cerebellar signs such as dysarthria or nystagmus may be present. The corrective effects of vision on balance and posture are seen in sensory ataxia. This is elicited by Romberg's test wherein swaying, which is almost absent when eyes are open and feet together, becomes prominent on eye closure. In cerebellar ataxia, the patient may sway even with eyes open, which worsens on eye closure.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 79.

79. C. Long-term potentiation (LTP) is conceptualized as a more or less permanent increase in synaptic efficacy following high-frequency activity across the synapse. Glutamate via NMDA receptor activation influences LTP. This may underlie changes in synaptic plasticity observed in learning- and memory-related processes. LTP is proposed to be the cellular biological correlate of long-term memory.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 28.

80. B. Most neurones from the ventral tegmental area of midbrain ascend in the medial forebrain bundle and the nigrostriatal pathway. These neurones are rich in dopamine. The dopamine neurones of the ventral tegmental area (VTA) are thought to play a central role in reward, motivation, and drug addiction. Nucleus basalis of Meynert is a major cholinergic site. Dorsal raphe nucleus is predominantly a serotonergic site. Locus coeruleus contains noradrenergic neurones.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 31.

81.A. Nucleus basalis of Meynert contains a majority of cholinergic neurones. Apart from hippocampal (entorhinal cortex) neuronal loss, selective loss of neurones in the nucleus basalis has led to the pursuit of cholinergic theories of memory impairment in dementia. Currently available pharmacological interventions largely target cholinergic deficiency in Alzheimer's disease.

Wilcock GK, Esiri MM, Bowen DM, and Smiths CCT. The nucleus basalis in Alzheimer's disease: cell counts and cortical biochemistry. *Neuropathology and Applied Neurobiology* 1982; **9**: 175–179.

82.C. SM, a patient with rare bilateral amygdala damage, was initially reported to lack the ability to recognize fear from facial expressions. Since the report of her case, a number of lesion and functional imaging studies have demonstrated the role of the amygdala in fear processing. It is possible that the amygdala mediates spontaneous fixations on the eyes when viewing expressions of faces. Lack of such fixation may lead to failure of spontaneous processing of fearful emotions.

Adolphs R, Gosselin F, Buchanan TW et al. A mechanism for impaired fear recognition after amygdala damage. *Nature* 2005; **433**: 68–72.

83.A. Pyridoxine (vitamin B₆) when phosphorylated to pyridoxal phosphate acts as a coenzyme in the conversion of glutamic acid to GABA, mediated by the rate-limiting enzyme glutamate decarboxylase. The pivotal role of this chemical interaction is evident from pyridoxine-dependent seizures, which can occur in relation to mutations of chromosome 5q31. Dysfunction of this enzyme leads to glutamate accumulation and excitatory damage via NMDA receptors.

Tan H, Kardaşlu F, Büyükkavci M, and Karakelleoğlu C. Pyridoxine-dependent seizures and microcephaly. *Pediatric Neurology* 2004; **31**: 211–213.

84.C. The circumventricular organs are midline structures around the third and fourth ventricles. Pineal gland, median eminence, neurohypophysis, subfornical organ, area postrema, subcommissural organ, organum vasculosum of the lamina terminalis, and the choroid plexus are considered as circumventricular organs. These structures lack the blood–brain barrier seen in other regions of brain. These areas enable the brain's direct response to chemical challenges in blood.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 38.

85.C. A neuromodulator is a substance that enhances or diminishes the effect of neurotransmitters but does not usually result in neuronal conduction changes on its own. Substance P, enkephalin, cholecystokinin, somatostatin, and neuropeptide Y are examples of neuromodulators. Neurotrophin is a substance produced to influence neuronal growth. Neurohormones are substances released by neurones into the blood stream to influence effector organs at distant sites, for example corticotrophin-releasing hormone.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 41.

86.D. Norepinephrine acts as physiological antagonist for acetylcholine. Physiological antagonism is defined as the process wherein two chemical molecules that act through two different receptor systems result in opposing actions in the body that tend to negate each other's physiological effect. Insulin and glucagon can be considered as physiological antagonists, to some extent.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 42.

87. E. Muscarinic receptors act via the G protein-coupled second messenger system. Nicotinic cholinergic receptors operate via ligand gated channels that are permeable to Na^+ , K^+ and sometimes Ca^{2+} . GABA_A receptors are also ligand-gated ion channels that allow Cl^- ions to pass through, resulting in inhibitory activity. Glycine receptors are strychnine-sensitive ligand-gated ion channels with inhibitory activity. Metabotropic receptors aside, most glutamate receptors (NMDA, AMPA, and kainate) are ionotropic and allow Ca^{2+} transit (NMDA, AMPA) or Na^+ , K^+ transit (kainate) via ligand-gated channels.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 43.

88. D. ^{11}C raclopride is used to identify postsynaptic dopamine receptors (D2/D3). Raclopride is related to the antipsychotic sulpiride and amisulpride (substituted benzamide); hence it acts as a D2/D3 inhibitor.

Johnstone EC et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 79.

89. D. Adipose tissues are the major source of leptin. The amount of leptin in plasma is directly proportional to degree of adiposity in one's body. Leptin enters the brain, by an unknown mechanism, to reduce appetite via a central mechanism. In obesity, a certain degree of leptin resistance exists, leading to high circulating levels of leptin.

Mantzoros CS. Leptin and the hypothalamus: neuroendocrine regulation of food intake. *Molecular Psychiatry* 1999; **4**: 8–12.

90. E. Thyroid hormone acts in a similar manner to steroid hormone. Receptors for these hormones are not present in the cell membrane but, upon cellular entry, they bind to nuclear receptors to directly affect cellular processes. These nuclear receptors act as hormone-activated transcription factors that modulate gene expression.

Brent GA. Mechanisms of disease: the molecular basis of thyroid hormone action. *New England Journal of Medicine* 1994; **331**: 847–853.

91. B. The patient described in the question is most likely to have a diagnosis of Alzheimer's dementia. Diffuse and neuritic plaques with amyloid deposits in cortex and hippocampus are highly suggestive of Alzheimer's disease. Ballooning of cells with intraneuronal accumulations suggests Pick's disease. Diffuse amyloid deposition restricted to blood vessels is seen in amyloid angiopathy. Eosinophilic rod-shaped inclusions of actin filaments are Hirano bodies, seen sometimes in Alzheimer's disease.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 899.

92.A. 5-HT_{1B} receptors are present as presynaptic autoreceptors. On stimulation, these receptors can decrease further serotonin release. Postsynaptic 5-HT_{1B} receptors may have a role in locomotor activity and aggression. 5-HT_{1A} receptors are associated with antidepressant activity. 5-HT_{2A} receptors are implicated in hallucinogenic properties of LSD-like drugs and blockade is associated with antipsychotic activity. 5-HT₃ is the only ligand-gated ion channel among serotonin receptors; it is present in gut in large numbers and may mediate emesis.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 110.

93. B. Dopamine exerts its action via one of two families of dopamine receptors. After receptor stimulation, dopamine can either be taken back into the presynaptic neurone and destroyed or repackaged as a neurotransmitter. Among those dopamines that are taken back, some are metabolized by monoamine oxidase (MAO). MAO_B selectively metabolizes dopamine. Catechol-O-methyltransferase (COMT) is localized in the postsynaptic neuronal cytoplasm and is involved in secondary metabolism of dopamine. The primary metabolite of dopamine is homovanillic acid (HVA).

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 99.

94. B. In depression, hypercortisolism is seen in a subgroup of patients. This can be demonstrated by the dexamethasone suppression test wherein exogenously administered steroid dexamethasone fails to activate the negative feedback loop to reduce endogenous cortisol. Depressed patients also show blunted TSH response when thyrotrophin-releasing hormone (TRH) is injected. A brisk GH release seen on apomorphine/levodopa challenge is absent in some patients with depression. This suggests dopaminergic dysfunction in a subgroup. Clomipramine challenge in normal subjects leads to increased serotonergic activation and prolactin release. This prolactin response to clomipramine-mediated via serotonin is blunted in depression. Psychotic depression shows more HPA axis disturbance than non-psychotic depression. Melancholic (somatic syndrome) depression increases the chance of finding endocrine disturbances among depressed patients.

Gelder M, López-Ibor J, and Andreasen N. *New Oxford Textbook of Psychiatry*, 1st edn. Oxford University Press, 2003, p. 711–719.

95. D. P300 is a positive component that occurs 250–500 ms after stimulus onset. Amplitude and latency of P300 is altered in schizophrenia. These changes reflect a trait rather than being related to psychotic state, but these are not specific to schizophrenia; for instance Alzheimer's disease patients show similar deficits. The reduction in amplitude is more pronounced in earlier-onset and paranoid subgroups. P300 is not affected by medication status, disease duration, or severity of psychopathology.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2005, p. 200.

96. C. Fluid intelligence includes non-verbal intellectual functions such as problem solving and reasoning; these are not influenced by one's cultural experience or education. Crystallized intelligence includes acquired knowledge, which is heavily influenced by culture, formal education, and opportunities. Kaufman Adolescent and Adult Intelligence Test measures both 'fluid' and 'crystallized' intelligence. The Wechsler Intelligence Scale for Children and the Wechsler Adult Intelligence Scale measure IQ and are influenced by cultural differences and formal educational attainment. Stanford–Binet Scale is one of the earliest intelligence scales and is influenced by school education. Raven's Progressive Matrix is a measure of ability to form perceptual relations and analogical reason; it is independent of language and formal schooling. It can be used for anyone above age 6.

Raven J. The Raven's Progressive Matrices: change and stability over culture and time. *Cognitive Psychology* 2000; **41**: 1–48.

97. C. Pro-opiomelanocortin (POMC) is a polypeptide precursor protein. It produces many biologically active peptides including the melanocyte-stimulating hormones (MSH), corticotrophin (ACTH), and β -endorphin. MSH and ACTH are collectively known as melanocortins and a family of specific receptors has been described for them. In the CNS, POMC-producing neurones are located in the arcuate nucleus of the hypothalamus and the nucleus tractus solitarius of the brainstem. The CNS POMC system regulates feeding behaviour, sexual behaviour, lactation, the reproductive cycle, and possibly central cardiovascular control.

Millington, GWM. The role of proopiomelanocortin (POMC) neurones in feeding behaviour. *Nutrition and Metabolism* 2007; **4**: 18.

98. B. GABA does not directly mediate working memory. Prefrontal dopamine via D₁ receptors is thought to heavily influence working memory capacity. GABA_A activation has sedative properties. GABA_A activation leads to an increase in seizure threshold via inhibitory activity. GABA_A also plays a role in memory consolidation. GABA agonists prevent formation of long-term memory, though the process of learning itself may not be affected. GABA_B activation mediates central muscle relaxation via spinal cord and brain receptors.

Dash PK, Moore AN, Kobori N, and Runyan JD. Molecular activity underlying working memory. *Learning and Memory* 2007; **14**: 554–563.

99. D. Several neuroanatomical differences between homosexuals and heterosexuals have been reported from human studies. The suprachiasmatic nucleus (SCN) has been noted to be larger and more elongated in homosexual males (and females in general). The third interstitial nucleus of the anterior hypothalamus (INAH-3) was noted to be smaller among homosexuals. Anterior commissure is larger in homosexual men than in heterosexual men. No sexual-orientation differences have been reported in the sexually dimorphic nuclei of the preoptic area in humans.

LeVay S. A difference in hypothalamic structure between heterosexual and homosexual men. *Science* 1991; **253**: 1034–1037.

100. E. Lewy bodies contain ubiquitin (non-specific) and alpha synuclein. Synucleopathies refer to a set of disorders in which aggregates of synculein accumulation is noted. Lewy bodies are demonstrated pathologically in these disorders, but unlike the Lewy bodies in the substantia nigra seen in Parkinson's disease, cortical Lewy bodies are not surrounded by a distinct halo that enables their identification. Recently, the development of immunostaining for ubiquitin and synuclein have increased the accuracy of visualizing Lewy bodies.

Ropper AH and Brown RH, eds. *Adams and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 908.

101. E. Wilson's disease is also known as hepatolenticular degeneration. It is an autosomal recessive disorder of copper metabolism. The abnormal gene (*ATP7B*) is located in chromosome 13. Ceruloplasmin is an α_2 globulin that normally carries 90% of the copper present in the plasma. In Wilson's disease, ceruloplasmin fails to bind copper and its excretion by the liver is impaired. The excess copper accumulates first in the liver and then in the brain (especially putamen and pallidus) and other tissues. In the early stages of the disease, proliferation of large protoplasmic astrocytes, such as Opalski cells and Alzheimer cells, occurs. Deposition of copper in Descemet's membrane in the cornea leads to the appearance of the golden-brown 'Kayser–Fleischer' (KF) ring. The main neurological abnormalities are rigidity, dystonia, chorea, athetosis, dysarthria, and tremor. It is considered that a pure psychiatric presentation occurs in 20–25% of cases. Around 50% of patients will have mental disturbances at some point during the course of the disease. Psychiatric manifestations tend to occur more commonly with neurological forms of Wilson's disease than with the hepatic form of the clinical syndrome. Cognitive impairment occurs in up to 25% of patients. The dementia is usually subcortical type with frontal deficits. Depression occurs in 30% of cases and suicidal behaviour may occur in between 4 and 16%.

Ring HA, and Serra-Mestres J. *Neuropsychiatry of the basal ganglia*. *Journal of Neurology Neurosurgery and Psychiatry* 2002; **72**: 12–21.

102. E. It has been postulated that exposure of the brain to alcohol during the period of rapid synaptogenesis (third trimester) leads to apoptosis and neuronal loss, especially in thalamic and basal ganglia area. Since this change is apoptotic, it does not lead to fibrous scarring. This apoptotic cell death has been postulated to be due to the action of alcohol on the NMDA and GABA receptors. Apparently, large quantities of alcohol taken during a short period of time, even once, as in a binge episode, can lead to these changes. The cluster of symptoms also depends on the timing of alcohol exposure, so if the exposure occurred during the first trimester it would lead to facial abnormalities. In addition to developing hyperactivity/attention deficit disorder and varying degrees of learning impairment in children, a high percentage have adult-onset neuropsychiatric disturbances, including major depression and psychosis. There is no evidence to suggest that thiamine deficiency mediates neuronal damage in fetal alcohol syndrome.

Ramachandran VS, ed. *Encyclopedia of the Human Brain*, Vol. 1. Academic Press, 2002, p. 95–96.

103. C. Cauda equina syndrome is characterized by low back pain (radicular pain), asymmetric weakness, areflexia, and sensory loss in the legs, and relative sparing of bowel and bladder function. The syndrome usually results from injury of multiple lumbosacral nerve roots within the spinal canal. Most commonly, this is due to a ruptured lumbosacral intervertebral disc (disc prolapse). Less common causes include lumbosacral spine fracture, haematoma within the spinal canal, and compressive tumours. Cauda equina must be differentiated from conus medullaris syndrome, which includes compression of the lower sacral and coccygeal segments. This results in bilateral saddle anaesthesia, prominent bladder and bowel dysfunction, and impotence. Cutaneous reflexes are absent, but the muscle strength is usually preserved in conus medullaris syndrome.

Kasper DL et al., eds. *Harrison's Principles of Internal Medicine*, 16th edn. McGraw-Hill, 2005, p. 98.

104. D. During embryonic development, gastrulation leads to the formation of the germ layers—ectoderm, mesoderm, and endoderm. Skin and nervous system develops from the ectoderm, the gut from the endoderm, and all other visceral organs from the mesoderm. After gastrulation, the notochord is formed from mesodermal cells. This notochord lies rostro caudally and it sends signals to the ectoderm lying adjacent to it, transforming them into neurectoderm. This forms the neuronal stem cells in the embryo. This strip of ectoderm is otherwise called the neuronal plate. By the third week of gestation, a groove develops on the dorsal aspect of the neural plate and this groove gradually deepens, forming neuronal folds. These folds gradually close bidirectionally by the end of the fourth week, forming the neural tube. Closure of the neural tube is susceptible to teratogenic influences operating in first trimester (e.g. valproate).

Ramachandran VS, ed. *Encyclopedia of the Human Brain*, Vol. 3. Academic Press, 2002, pp. 316–318.

105. E. Sphincter disturbance is not a feature of isolated cerebellar lesions. Unilateral lesions of the cerebellum affect ipsilateral limbs. Symptoms of cerebellar damage include asynergia (loss of coordination between muscles leading to jerky movements), dysmetria (defects in reaching targets via crude motor movements, for example past pointing on finger–nose test), intention tremor, dysarthria, disturbed balance including gait ataxia (produces wide-based, staggering gait prone to shuffle or fall), hypotonia, dysdiadochokinesia (inability to do rapid alternate movements), and nystagmus. The cerebellum has been suggested to be a seat of cognitive function, especially working memory.

Brazis P et al. *Localisation in Clinical Neurology*, 5th edn. Lippincott Williams and Wilkins, 2007, p. 372.

106. E. The vestibulocochlear nerve is purely sensory. It has two components, the vestibular and the cochlear, both of which are sensory. The vestibular component transmits information on position and balance received from the semicircular canals and the cochlear component serves the sense of hearing. The hypoglossal nerve innervates the ipsilateral side of the tongue. It is a purely motor efferent nerve. In unilateral lower motor neurone palsy of the eighth nerve, when protruded, the tongue deviates toward the side of weakness. The trochlear nerve is unique among cranial nerves in that it decussates to the contralateral side and its point of exit is through the dorsal surface of the brain. The trochlear nerve thus innervates the superior oblique muscle of the contralateral eye. It is a purely efferent nerve. The facial nerve innervates the muscles of the face. It has a sensory component, innervating the anterior two-thirds of the tongue, via the chorda tympani. Facial nerve palsy causes deviation of the angle of mouth to the normal side. As a mnemonic, ‘the rule of 17’ applies to deviations in cranial nerve palsies. Palsy of tenth (vagus and hence palate) and seventh (facial) nerve leads to deviation to the normal side. Palsy of the fifth (trigeminal and hence the jaw muscles) and twelfth (hypoglossal, tongue) nerve leads to deviation to the paralytic side.

Ramachandran VS, ed. *Encyclopedia of the Human Brain*, Vol. 2. Academic Press, 2002, p. 65.

107. C. The pathway that enables normal vision starts from rods and cones in the retina, which are receptors of the ganglion cells. The axons of ganglion cells extend as the optic nerve, through the optic chiasma, via the optic tract, and synapse at the lateral geniculate body of thalamus. From the lateral geniculate body, second-order neurones go through the optic radiation to the visual cortex in the occipital lobe. In contrast, the pathway constituting the pupillary light reflex digresses from the visual pathway before it joins the lateral geniculate body to reach the dorsal midbrain. They synapse at the pretectal nuclei, from where second-order neurones go to the Edinger-Westphal nucleus on both sides. Edinger-Westphal nuclei, via the third nerve, control the pupillary constrictors that constitute the response to light. So, pupillary light reflex do not involve the occipital cortex. Hence even in those with cortical blindness due to bilateral occipital cortex damage, light reflex may be intact.

Brazis P et al. *Localisation in Clinical Neurology*, 5th edn. Lippincott Williams & Wilkins, 2007, p. 158.

108. C. The hypoglossal nerve is a purely somatic motor nerve. The autonomic nervous system has two parts, the sympathetic and parasympathetic. Sympathetic output from the CNS is mainly through thoracic and lumbar spinal nerves. Sympathetic preganglionic nerves are short and form synapses in paired ganglia adjacent to the spinal cord. The parasympathetic system has a craniosacral output, that is it operates through some cranial nerves and sacral spinal nerves. These have long preganglionic nerves which form synapses at ganglia near or on the organ innervated. Among the cranial nerves, the vagus is the chief parasympathetic nerve. It supplies parasympathetic efferents to heart and most of the abdominal viscera and the gastrointestinal tract, but oculomotor (III), facial (VII), and glossopharyngeal nerves (IX) also carry parasympathetic fibres. The neurotransmitter at the preganglionic nerve ending is acetylcholine in both sympathetic and parasympathetic systems. At the post ganglionic nerve ending, the neurotransmitter is acetylcholine in the parasympathetic system and mostly norepinephrine in the sympathetic system.

Ramachandran VS, ed. *Encyclopedia of the Human Brain*, Vol. 2. Academic Press, 2002, p. 67.

109. D. The sympathetic system is responsible for the 'flight and fight' and the parasympathetic system for the 'rest and digest' reactions. Generally, they are considered to have opposing actions. The sympathetic system is activated in emergency situations, where the body requires more energy. This response includes increased cardiac output, dilatation of bronchioles, routing blood to the muscles, glycogen and fat breakdown leading to a rise in the blood glucose and fatty acids, and slowing down of digestion and renal filtration. This also leads to a decrease in gastrointestinal secretion and motility (leading to dryness of the mouth). In addition, sympathetic activity causes constriction of bladder and bowel sphincters and relaxation of the smooth muscles of the viscera. The pupils dilate due to action on the dilators. In contrast, parasympathetic stimulation leads to pupillary constriction and accommodation for close vision, reduces heart rate, constricts bronchioles, and increases gastrointestinal secretions with relaxation of sphincters. Parasympathetic stimulation is necessary for erection and sympathetic stimulation for ejaculation.

Ganong WF. *Review of Medical Physiology*, 22nd edn. McGraw-Hill, 2005, p. 229.

110.D. The posterior column is responsible for transmission of proprioception, light touch, tactile localization, and vibration senses. Posterior column dysfunction can result in disturbances in the knowledge of extremity movement and position. This presents as sensory ataxia (noted first in the dark as visual input does not compensate for the lost position sense) and a positive Romberg's sign. Pain and temperature is transmitted to the central nervous system through the spinothalamic tract. Spinothalamic tracts cross over two segments above the level of entry of the root at the spinal cord. Posterior column tracts cross over only at the midbrain level, where they synapse with the cuneate and gracilis nuclei. Hence, if hemisection of the cord takes place, ipsilateral posterior column senses are lost below the level of section; contralateral spinothalamic sensations are lost from two levels below the site of section.

Brazis P et al. *Localization in Clinical Neurology*, 5th edition. Lippincott Williams and Wilkins, 2006, p. 106.

111.A. The term basal ganglia traditionally applied to five large, subcortical nuclear masses on each side of the brain: the caudate nucleus, putamen, and globus pallidus, subthalamic nucleus, and substantia nigra. The globus pallidus is further divided into an external and an internal segment, and the substantia nigra is divided into a pars compacta and a pars reticulata. The caudate nucleus and the putamen are frequently called the striatum; the putamen and the globus pallidus are sometimes called the lenticular nucleus. The nucleus accumbens is the region where the putamen and the caudate merge anteriorly. What structures comprise the basal ganglia has been a debate over the years. More recently, an additional term, 'ventral striatum' has been introduced to describe those parts of the striatum (caudate and putamen) closest to limbic structures and that are involved in cognitive and behavioural functions. The ventral striatum includes the nucleus accumbens, which plays a major role in motivational and reward-related behaviour. Amygdala is closely related to the basal ganglia due to its functional and structural proximity. The amygdala complex develops from the same tissue mass as the caudate nucleus.

Ring HA and Serra-Mestres J. Neuropsychiatry of the basal ganglia. *Journal of Neurology, Neurosurgery and Psychiatry* 2002; **72**: 12–21.

112.C. Horner's syndrome is caused by sympathetic dysfunction at the craniocervical output. Clinical features include ipsilateral mild (usually <2 mm) ptosis, anisocoria (unequal pupils) due to ipsilateral miosis, enophthalmos, loss of ciliospinal reflex, and ipsilateral facial anhidrosis (mnemonic 'PAMELA'). Nystagmus is generally not seen. Nystagmus is a rhythmical oscillation of the eyes, occurring pathologically in a wide variety of diseases. Abnormalities of the eyes or optic nerves, especially when the onset is in childhood, may present with nystagmus (pendular or jerk nystagmus). Jerk nystagmus is characterized by a slow drift off the target, followed by a fast corrective saccade. Jerk nystagmus can be downbeat, upbeat, or horizontal (left or right) with the names being given according to the direction of the fast phase. Gaze-evoked nystagmus is the most common form of jerk nystagmus, where the subject is asked to look to the corner of the eye. Exaggerated gaze-evoked nystagmus can be seen in: drug intake/toxicity (sedatives, anticonvulsants, alcohol); muscle paresis; myasthenia gravis; demyelinating disease; and cerebellopontine angle, brainstem, and cerebellar lesions. Downbeat nystagmus usually occurs from lesions near the craniocervical junction, while upbeat nystagmus is associated with damage to the pontine tegmentum, from stroke, demyelination, or tumour. Vestibular system dysfunction also leads to nystagmus. This occurs in discrete attacks, usually associated with sudden movements of the head and is accompanied by symptoms of nausea, tinnitus, hearing loss, and vertigo.

Kasper DL et al., eds. *Harrison's Principles of Internal Medicine*, 16th edn. McGraw-Hill, 2005, p. 176.

113.A. Ageing results in declines in a variety of cognitive domains, but some abilities appear to be relatively preserved. The relatively unaffected faculties include general intellectual knowledge, vocabulary and comprehension, attention processes, language abilities related to phonologic, lexical, and syntactic knowledge, motor skills that are learned early in life and repeatedly used, and immediate and implicit memory, including some aspects of short-term memory. Significant age-associated decline is seen in processing speed, ability to reason and solve problems, fluid intelligence, dividing attention between two tasks, executive function domains (mental flexibility, abstraction, and concept formation), visuospatial skills (drawing, construction, and maze learning), language skills involving semantic knowledge needed for naming and verbal fluency, motor skills that require speed, and ability to learn and retain new information for long-term access.

Ramachandran VS, ed. *Encyclopedia of the Human Brain*, Vol. 1. Academic Press, 2002, p. 48.

114.A. Gelastic seizures are characterized by shallow laughter occurring in fits. The laughter usually lasts less than 1 minute and is then followed by signs of complex partial or focal seizures, such as eye and head movement, automatisms such as lip-smacking, and altered awareness. In many cases, these associated features may be absent, resulting in delayed diagnosis. The most common areas of the brain associated with gelastic seizures are the hypothalamus, the temporal lobes, and the frontal lobes. A combination of gelastic seizures and precocious puberty is often noted and can be attributed to hamartoma of the hypothalamus.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 486.

115.C. The cholinergic nicotinic receptor forms the prototypical model for ionotropic receptors. It is a heteromeric pentameric protein, and each subunit is a transmembrane protein with four transmembrane domains (in total 20 transmembrane domains compared to seven in the case of metabotropic receptors). Binding of a neurotransmitter to the extracellular domain of the ionic receptor results in the brief opening of a transmembrane ionic pore. This leads to an influx of certain ions, which produces a brief modification of the resting membrane potential. This results in a postsynaptic action potential. Muscarinic acetyl choline receptors are not ionotropic; they are G-protein coupled and act via second messengers. GABA_A not GABA_B is an ion channel receptor. Norepinephrine receptors are largely G-protein coupled; they are not ion channels.

Ramachandran VS, ed. *Encyclopedia of the Human Brain*, Vol. 4. Academic Press, 2002, p. 525.

116.A. The presence of spiked red blood cells (RBCs) together with ataxia, progressive weakness, and cognitive impairment is suggestive of neuroacanthocytosis. Patients with neuroacanthocytosis may also show personality changes characterized by impulsivity, distractibility, and compulsivity. Neuropathological findings include severe atrophy of the caudate and putamen with loss of neurones and an associated astrocytic reaction. Less severe changes are seen in the pallidum, thalamus, substantia nigra, and anterior horn cells of spinal cord. Acanthocytes are spiked RBCs seen in peripheral blood smears. Acanthocytosis is also seen in patients with abetalipoproteinaemia or hypobetalipoproteinaemia, where serum vitamin E and lipoprotein levels are abnormal.

Ropper AH and Brown RH, eds. *Adam and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 913.

117.D. The exact mechanisms of action of LSD and other hallucinogens are not completely understood as yet, but there is substantial evidence pointing towards serotonergic systems in the brain. Receptor-binding studies have shown that radiolabelled LSD binds to 5-HT_{2A} and 5-HT_{1C} receptors. Hallucinogens have agonist actions at the 5-HT_{2A} receptor. The psychoactive and behavioural effects of hallucinogens are blocked by 5-HT_{2A} antagonists. Tolerance/tachyphylaxis of hallucinogenic effect is related to down-regulation of 5-HT_{2A} receptors. There may be a role for 5-HT_{2C} receptors too in mediating the actions of hallucinogens. LSD is only a partial agonist at 5-HT_{2A}, in contrast to the full agonist actions of other hallucinogens. The 5-HT_{2A} receptor potentiates glutamatergic and dopaminergic neurotransmission when activated, while activating the inhibitory GABA interneurone system.

Jakab RL and Goldman-Rakic PS. 5-Hydroxytryptamine2A serotonin receptors in the primate cerebral cortex: Possible site of action of hallucinogenic and antipsychotic drugs in pyramidal cell apical dendrites. *Proceedings of the National Academy of Sciences of the USA* 1998; **95**: 735–740. Kranzler HR and Ciraulo DA, eds. *Clinical Manual of Addiction Psychopharmacology*, 1st edn. American Psychiatric Publishing, 2005, p. 217.

118.B. The acute administration of all addictive drugs (except benzodiazepines) stimulates dopamine transmission in the projection from the ventral mesencephalon to the nucleus accumbens. This projection is generally referred to as the mesolimbic dopamine system. The site of action by which different street drugs activate dopamine can be classified into three distinct types:

1. Increasing the presynaptic release of dopamine without directly altering the activity of dopamine neurones, for example stimulants acting via dopamine reuptake channels
2. Stimulation of dopamine neurones via receptors on dopaminergic neuronal membrane, for example marijuana via cannabinoid receptors
3. Via decrease of inhibitory input into dopaminergic cells leading to disinhibition of dopamine activity, for example opioids and alcohol.

Kay J and Tasman A. *Essentials of Psychiatry*. John Wiley and Sons, 2006, p. 150.

119.A. Neurotrophins comprise a family of proteins including nerve growth factor (NGF), brain-derived neurotrophic factor (BDNF), and neurotrophins (NT)-3, -4/5, and -6. Proneurotrophins are enzymatically processed to create mature neurotrophins. Neurotrophins bind to specific tyrosine kinase receptors. Neurotrophins promote neuronal growth, differentiation, and survival, and modulate synaptic plasticity. These growth-related effects result from the interaction of neurotrophins with mitogen-activated protein kinase (MAPK) signalling pathway and the phosphatidylinositol-3 kinase pathway. In addition, the neurotrophins can inhibit cell death cascades. Reduced expression of neurotrophins such as BDNF has been proposed to underlie deficits in hippocampal neurogenesis seen in animal models of depression. Chronic antidepressant treatments are shown to upregulate neurotrophin expression, mediating relief from depression. Neurotrophin-mediated proliferation of hippocampal cells may be one of the final common pathways of antidepressant effects.

Fatemi HS and Clayton PJ. *Medical Basis of Psychiatry*. Humana Press, 2008, p. 524.

120. D. L-tyrosine is an amino acid derived from food proteins. It is also derived from the catabolism of phenylalanine in the liver by phenylalanine hydroxylase. L-tyrosine forms the precursor for the catecholamine neurotransmitters. Dopamine is the major initial product derived from L-tyrosine. Dopamine hydroxylase further converts dopamine into norepinephrine. In cells that contain phenylethanolamine N-methyltransferase (PNMT), norepinephrine undergoes further processing via methylation to produce epinephrine. Epinephrine is formed in trivial amounts in the CNS but is a major product in the adrenal medulla. Any drug that enhances the action of tyrosine hydroxylase and dopamine hydroxylase is likely to enhance noradrenergic transmission. Catecholamines are metabolized by two enzymes: monoamine oxidase (MAO) and catechol-O-methyl transferase (COMT).

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 103.

121. C. The majority of distributed serotonin in human body is located in the intestines. Due to the wide distribution of serotonin receptors, side-effects of serotonergic drugs may be variable; for example 5-HT₃ receptors in the area postrema or the hypothalamus are associated with nausea and vomiting. The receptors in the basal ganglia are associated with akathisia and agitation. Limbic receptors are associated with an anxiety response when serotonergic drugs are administered initially. The serotonin receptors in spinal cord may produce sexual dysfunction. The intestinal receptors constitute nearly 90% of the body's serotonin receptors. Hence the common side-effects with most serotonergic drugs are gastrointestinal upset and diarrhoea.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 105.

122. E. The neurotransmitter that brings a signal to a neurone is considered to be the 'first messenger'. For the signal to get across to the postsynaptic neurone, it must be transformed into an intraneuronal message. This is enabled via formation of the 'second-messenger' molecules. Second messengers generally do not act outside the cell of origin. The most commonly encountered second messengers include cAMP and cGMP, the calcium ion (Ca²⁺), and the phosphoinositol metabolites such as inositol triphosphate (IP3) and diacylglycerol (DAG). Gases such as nitric oxide and carbon monoxide also act as intraneuronal second-messenger molecules. The second messengers are not hormones as they do not reach tissues via the blood stream. Unlike receptor proteins, they do not combine with the neurotransmitter molecules directly. They are present throughout the CNS.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 98.

123.A. This patient's presentation is suggestive of Bell's palsy. It is the most common cause of facial paralysis, usually occurring on one side only. The lifetime prevalence is about 1 in 60 in the UK. It is most commonly seen between the ages of 15 and 45, in both men and women. Pregnancy and diabetes may increase the risk of Bell's palsy substantially. Though the exact cause is not known, a viral aetiology is suspected (herpesvirus). The symptoms usually develop overnight. Most patients present with difficulty closing the eye, drooling of saliva, and sagging of the eyebrow on one side. Less commonly, patients may have heightened sensitivity to loud noise on the affected side. Most patients (nearly 80%) recover completely within 3 weeks. Almost all patients recover within 6 months. Patients with Bell's palsy exhibit Bell's phenomenon. Bell's phenomenon is a normal defence reflex present in about 75% of the population. It results in elevation of the globes when shutting eyes closed or when the eyes are directly threatened by external agents. Such upward movement helps to protect the most important structures (cornea and lens) of one's eyes. This elevation becomes noticeable when the orbicularis muscle becomes weak as in Bell's palsy. Bilateral Bell's phenomenon is found in myasthenia gravis, sarcoidosis, bilateral Bell's palsies, congenital facial diplegia, some rare forms of muscular dystrophy, motor neurone disease, and Guillain–Barré syndrome.

Holland NJ and Weiner GM. Recent developments in Bell's palsy. *British Medical Journal* 2004; **329**: 553–557.

124.C. Serotonergic cells are localized in the brainstem in a group of nuclei called the raphe nuclei. In contrast to the more circumscribed dopaminergic pathways, almost all parts of the brain receive serotonergic input. This probably explains the multiple effects of serotonin receptors on mood and behaviour. All serotonin receptors are G-protein linked, except 5-HT₃ which is ligand gated. Serotonin does not cross the blood–brain barrier and thus the brain synthesizes its own serotonin. This is in turn determined by concentrations of free plasma tryptophan and transport across the blood–brain barrier. This forms the basis of the rapid tryptophan depletion test. Tryptophan hydroxylase hydroxylates tryptophan to 5-hydroxy tryptophan (5-HTP), which is further decarboxylated to serotonin (5-HT) by aromatic-L-amino acid decarboxylase (AA DC) in the presence of vitamin B₆ as coenzyme. The rate-limiting step in serotonin synthesis is considered to be the availability of 5-HTP. In parallel with dopamine and norepinephrine, following release into the synaptic cleft, 5-HT is either metabolized or actively transported back into the neurone by a high-affinity transporter, the serotonin reuptake transporter (SERT). SERT is encoded by a single gene on chromosome 17. The SERT gene has been recently postulated to play an important role in gene–environment interaction in disorders such as depression.

Gillette R. Evolution and function in serotonergic systems. *Integrative and Comparative Biology* 2006; **46**: 838–846.

Caspi A, Sugden K, Moffitt TE et al. Influence of life stress on depression: Moderation by a polymorphism in the 5-HTT gene. *Science* 2003; **301**: 386–389.

125.C. Prion protein (PrP) is a glycoprotein anchored to neuronal cell membranes. The normal function of prion protein is not known. Bovine spongiform encephalopathy ('mad cow disease') and Crutzfeldt–Jakob disease are associated with altered prion proteins. In prion diseases, the normal cellular form of PrP (called PrP^C) undergoes transformation to an altered version (called scrapie-associated prion protein PrP^{Sc}). The latter accumulates in the brain to form insoluble aggregates, leading to neuronal dysfunction, but unlike other neurodegenerative diseases, prion diseases are transmissible. This is made possible because PrP^{Sc} imprints its pathological conformation onto other, normal PrP^C molecules, thus 'converting' them to be abnormal. PrP^C and PrP^{Sc} do not differ in their amino acid sequences.

Aguzzini A, Baumann F, and Bremer J. The prion's elusive reason for being. *Annual Review of Neuroscience* 2008; **31**: 439–477.

126. D. The establishment and maintenance of a wakeful state is called arousal. In humans, arousal activity requires at least three brain regions. The most important of these is the ascending reticular activating system (ARAS). ARAS may have a role in setting the level of consciousness. ARAS, via the intralaminar nuclei of the thalamus, project widely throughout the cerebral cortex. A synchronized, rhythmic burst of neuronal activity (20–40 Hz frequency) results from ARAS and thalamic coordination. The degree of synchronization varies directly with the level of wakefulness. During sleep the synchronicity is lost. The third most important region in arousal state is the right frontal lobe. The right frontal lobe is essential for the 'maintenance' of attention; this is evident when testing letter-cancellation tasks or trail-making tasks in patients with right frontal lesions.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 87.

127. E. Hodgkin and Huxley showed that the inside of a cell, such as a neurone, is negatively charged compared to the outside. This is called the resting membrane potential and its value ranges between -40 mV and -90 mV (average -70 mV), depending on the type of cell. This negative resting membrane potential arises due to the membranes of the resting neurone being more permeable to potassium ions than to any other ions. There are more potassium ions inside the cell than outside it, which is due to a constant outward leak creating a negative potential inside the cell. An action potential is initiated in the axon hillock when the synaptic signals received by the dendrites and soma are sufficient to raise the intracellular potential from -70 mV to the threshold potential of -55 mV . When this potential is reached, the Na^+ channels, which are dormant at rest, will open. This Na^+ influx causes rapid reversal of the membrane potential from -70 to $+40\text{ mV}$.

Ramachandran VS, ed. *Encyclopedia of the Human Brain*, Vol. 1. Academic Press, 2002, p. 1–12.

128. D. Glycine is an inhibitory transmitter, predominantly found in the spinal cord; it has relatively insignificant effects in the brain compared to the spinal cord. Glycine acts on a chloride channel that is different from GABA_A receptors, called the strychnine-sensitive glycine receptor. On activation, the transmembrane glycine receptors facilitate entry of chloride ion into the cell, leading to hyperpolarization of the cell. Glycine is synthesized from serine; this conversion is mediated by rate-limiting steps via serine trans-hydroxymethylase and glycinate dehydrogenase. Glycine also serves as an obligatory neurotransmitter adjunct for glutamate activity on the NMDA glutamate receptors (non-strychnine-sensitive glycine site). Some clinical trials have shown a reduction in the negative symptoms of schizophrenia using D-serine or glycine mediated via NMDA receptors, though this has not been widely replicated.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 109.

129. C. Positron emission tomography (PET) is considered as the gold standard of functional neuroimaging modalities. Among other available techniques, only PET can measure cerebral glucose metabolism directly. In addition, a large number of radioligands for receptor characterization are available for PET. Despite these advantages, PET is not widely available due to the expensive nature of the equipment; it requires relatively rapid access to a cyclotron to produce the positron-emitting radionuclides.

Kay J and Tasman A. *Essentials of Psychiatry*. John Wiley and Sons, 2006, p. 232.

130. C. Most hormones show a diurnal–nocturnal variation in their plasma levels. This is partly related to circadian mechanisms and hypothalamic functions. Level of physical activity and diurnal change in metabolic requirements may also influence the hormonal levels in blood. Growth hormone regulates carbohydrate and lipid metabolism. There is a nocturnal surge of growth hormone seen during slow wave sleep (stage 3 and 4 NREM sleep). Speculative association of growth hormone surge and memory consolidation has not been borne out by experimental results.

Gais S, Hülleman P, Hallschmid M et al. Sleep-dependent surges in growth hormone do not contribute to sleep-dependent memory consolidation. *Psychoneuroendocrinology* 2006; **31**: 786–791.

131. C. The presentation here is consistent with craniopharyngioma. It is a benign, slow-growing tumour involving the pituitary gland. The clinical presentation is usually insidious with the most common presenting symptoms being headache, endocrine dysfunction, and visual field disturbances. The headache may be positional and slowly progressive. Hypothyroidism, adrenal failure, and diabetes insipidus are the common endocrine disturbances noted. Young patients may have growth failure and/or delayed puberty. Visual field defects are due to pressure effects on the optic nerve route. Bitemporal hemianopia is the most common problem due to pressure at the chiasma. The anatomic location of the craniopharyngioma may be classified into prechiasmatic (associated with optic atrophy), retrochiasmatic (associated with signs of increased intracranial pressure such as papilledema), or intrasellar (associated with headache and endocrine dysfunction). The diagnosis is strongly suggested by imaging studies. The appearance of a suprasellar or intrasellar calcified cyst is considered to be the radiological hallmark. CT scan is the most sensitive method as calcifications are easily picked up as high-density areas. MRI is very helpful for neurosurgeons to plan a surgical approach.

Ropper AH and Brown RH, eds. *Adams and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, pp. 573–574.

132. E. The embryogenetic theory of craniopharyngioma suggests the involvement of Rathke's pouch. The infundibulum is a downward projection of diencephalon; the Rathke's pouch is an upward elongation of the primitive oral cavity. Rathke's pouch and the infundibulum develop during the fourth week of gestation and grow towards each other until they unite to form the hypophysis of the pituitary gland during the second month. The remnants of Rathke's pouch involute into a cleft and disappear completely in normal conditions. In some cases, this Rathke's cleft remnant can become the site of origin of craniopharyngiomas. Alar plate is related to development of the spinal cord. Isthmus of thyroid is related to thyroglossal duct.

Ropper AH and Brown RH, eds. *Adams and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, pp. 573–574.

133. D. The patient described in Question 133 has an acute onset of flinging movements of one side of the body. This is called hemiballism. Movements are usually involuntary, wide amplitude, and irregular with no pattern or rhythm. They commonly involve the arm and leg together; facial involvement has been reported in about half of the cases. Movements are increased with action, decreased with relaxation, and absent during sleep. In some patients the movements can cause physical exhaustion or injury of the affected limb. Hemiballism is considered to be primarily a disorder of the contralateral subthalamic nuclei (STN), but recently lesions outside STN have been demonstrated in patients with hemiballism. It is noted that the hemiballism caused by lesions of the STN is more severe than that caused by lesions elsewhere.

Postuma RB and Lang AE. Hemiballism: revisiting a classic disorder. *Lancet Neurology* 2003; **2**: 661–668.

134. C. The cardinal function of prefrontal cortex is planning and organization of behaviour (executive function) in addition to functions of short-term memory, motor attention, and inhibitory control. The change in Gage's personality would be consistent with damage to the orbitofrontal cortex of the ventral aspect of his frontal lobe, affecting affect and emotion. A pseudopsychopathic syndrome, characterized by impulsivity and socially inappropriate behaviour, is recognized in orbitofrontal damage. Inferior parietal cortex may play a role in attention and body image function. The primary function of superior temporal cortex is auditory processing. The hippocampus is the seat of episodic memory; lesions can result in amnesia. The hypothalamus is involved in appetitive behaviours such as hunger, thirst, and sex.

O'driscoll K and Leach JP. 'No longer Gage': an iron bar through the head. *British Medical Journal* 1998; **317**: 1673–1674.

135. A. Mononeuritis multiplex is a form of peripheral neuropathy wherein axonal destruction occurs in different sites leading to sensory and motor deficits. The nerves involved are generally multiple and random with no predictability of progression. This acute or subacute involvement of multiple individual nerves may be serial or even simultaneous. It is not a single disease but a syndrome caused by various disorders; often the final common pathway includes vascular damage to neurones. Nearly one-third of cases are idiopathic. The most common identifiable cause in adults is diabetes mellitus, followed by vasculitis syndromes such as polyarteritis nodosa and connective tissue diseases such as rheumatoid arthritis or systemic lupus erythematosus. In children and adolescents, the most common cause of mononeuritis multiplex is connective tissue disease. Mononeuritis multiplex can mimic conversion disorder and present to psychiatric units.

Ropper AH and Brown RH, eds. *Adams and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 1137.

136. E. The question describes the classic form of the Stroop Colour–Word Test. In this test the subject is initially required to read names of some basic colours. Later the subject is asked to name the colours of geometrical shapes. Following this, the test of interference is applied. Looking at a colour name written in a different colour produces a conflict; this makes the subject read the name instead of saying the colour in which it is written, for example if the word 'blue' is written in green the subject tends to say blue, even when asked to name the displayed colour. The classic form of the Stroop Colour–Word Test is the most commonly used, though variations such as Emotional Stroop are now available. Rorschach's is a projective test which uses ink-blot images. The Continuous Performance Test measures sustained/selective attention and impulsivity.

Goldfarb L and Henik A. New data analysis of the stroop matching task calls for a reevaluation of theory. *Psychological Science* 2006; **17**: 96–100.

137.A. Dopamine is synthesized from the amino acid tyrosine. Initially, tyrosine is converted to L-dihydroxyphenylalanine (L-DOPA) by tyrosine hydroxylase (the rate-limiting step). L-DOPA is rapidly converted to dopamine by dopa decarboxylase. Dopamine is stored in vesicles and 80% of the released dopamine is rapidly transported back into the nerve terminal by a dopamine-specific transporter (DAT). This intracellular extravesicular dopamine is metabolized by monoamine oxidase (MAO) to dihydroxyphenylacetic acid (DOPAC). Twenty percent of the released dopamine is sequentially degraded extracellularly by catechol-O-methyltransferase (COMT) and MAO to 3-methoxytyramine (3-MT) and homovanillic acid (HVA). Dopaminergic cell bodies in the brain are mainly localized in the ventral tegmental area in the brainstem. There are predominantly four pathways that are considered to be dopaminergic in the brain: mesocortical and mesolimbic axons originate from the VTA and project to the prefrontal cortex and limbic structures, respectively; the tuberoinfundibular pathway mediates release of prolactin from the pituitary; and the nigrostriate pathway forms an integral part of the basal ganglion extrapyramidal system.

Elsworth JD and Roth RH. Dopamine synthesis, uptake, metabolism, and receptors: relevance to gene therapy of Parkinson's disease. *Experimental Neurology* 1997; **144**: 4–9.

138.C. Parkinsonian tremor is usually of large amplitude with a frequency of 4 to 6 cycles per second. It is a resting tremor which persists even during action. Parkinsonian tremor is not reduced by alcohol but is exaggerated in stressful situations. In contrast, benign essential tremor is usually of smaller amplitude and higher frequency (10 to 12 cycles per second). It is often seen during action and may be unnoticeable during rest. It is exacerbated by stress, similar to Parkinsonian tremor. Clinically, essential tremor is similar to exaggerated physiological tremor.

Cummings JL and Trimble M. *Neuropsychiatry and Behavioural Neurology*. American Psychiatric Publishing, 2002, p. 187.

139.D. The patient described here has acute, severe headache, photophobia, and meningism. These features are highly suggestive of subarachnoid haemorrhage (SAH). A CT scan is not 100% sensitive in ruling out possible intracranial bleed. Given the high clinical suspicion, the gold standard test for SAH, lumbar puncture, must be carried out. Presence of depression must not distract one from considering acute medical causes of somatic complaints such as headaches. Haloperidol is not indicated in this scenario. Please note that if the CT scan discloses a subarachnoid haemorrhage, lumbar puncture need not be carried out as a routine.

Ropper AH and Brown RH, eds. *Adams and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 328.

140.C. This patient is having an infarct of the thalamus. Thalamic infarcts affecting ventral posterolateral nucleus and posteromedial nucleus result in a severe sensory syndrome characterized by intense burning pain, hyperesthesia, or hemianaesthesia affecting the contralateral body. Cold thermal stimuli, emotional stress, and loud sounds may aggravate the painful state. Despite this apparent hypersensitivity, the patient shows an elevated pain threshold requiring a stronger than usual stimulus to produce a sensation of pain (hypoalgesia with hyperpathia). This thalamic pain syndrome is also called Dejerine–Roussy syndrome. Some patients may develop hemiataxia and choreoathetosis.

Ropper AH and Brown RH, eds. *Adams and Victor's Principles of Neurology*, 8th edn. McGraw-Hill, 2005, p. 141.

INDEX

Best of Five MCQs for MRCPsych Paper 2

Key: ■ denotes question, ■ denotes answer

- 5-HT_{1A} receptors 212
5-HT_{1B} receptors 212
5-HT_{2A} receptors 212
5-HT₃ receptors 212
- ABCD system of emotional self-control 96, 115
absence seizures 200
abulia 195
acamprostate 130, 142
and disulfiram 153
hepatic failure 142
initiating 91, 108
mechanism of action 153
- acanthocytosis 219
accuracy of a test 80
acetazolamide and lithium 143
acetylcholine
parasympathetic nervous system 217
physiological antagonist for 178, 211
- acetylcholinesterase 119, 140
- action potential 223
- active imagination, Jungian psychotherapy 104
- addiction 184, 220
adenine 29
- ADHD see attention deficit hyperactivity disorder
- adoption studies 43
- adrenalin, synthesis from noradrenalin 184, 221
- adrenocorticotropic hormone (ACTH) 214
- advanced psychology
answers 99–115
books 3, 7
preparing for the exam 2
questions 83–97
syllabus 2
- Aetiology and Ethnicity study of Schizophrenia and Other Psychoses (AESOP) 78
- affection of a drug 137
- affinity of a drug 137
- after the exam 6
- age correction, family genetic studies 38
- age factors
age as social factor learnt by a child 103
language development 112
- OCD 81
- phobias 56, 74
prevalence of mental health disorders 55, 72
self-recognition, development of 86, 103
social categories, learning 86, 103
suicide 61, 79
theory of mind 86, 103
- ageing, normal features of 183, 219
- agnosia 195
agomelatine 159
agonists 138
agoraphobia 56, 73
agrammatis 192
agraphia 192
akathisia 146
alar plate 224
alcohol, teratogenic effect on neuronal development 181, 215
- alcohol problems
acamprostate 108, 130, 153
adolescents 62, 80
behavioural couples therapy 101
benzodiazepines 132, 156
group therapy 107
lifetime presence 70
relapse 130, 152
relapse prevention 121, 142
withdrawal symptoms 142
- alexia 192
alien hand syndrome 204
allelic heterogeneity 40
Allport, Gordon W. 110
- alpha synuclein 214
- Alzheimer cells 181, 215
- Alzheimer's disease 212
APOE gene 24, 45
brain region showing preferential degeneration 177, 211
donepezil 152
early nerve cell loss 173, 206
focal cortical deficits 204
locus heterogeneity 38
memantine 125, 146, 207
nominal aphasia 206
P300 deficits 213

- Alzheimer's disease (*Cont.*)
 reading ability 204
 tau protein 9, 28, 44
- amantadine 158
- amaurosis fugax 202, 203
- ambivalence 114
- amiloride 145
- amino acid activation 28
- amisulpride 142, 149
- amitriptyline 139, 150
- amnesia 163, 170, 194, 196
 dissociative fugue 203
 post-traumatic 198
 transient global 205
- amoxicillin 139
- amphetamine 131, 154
- amplification, group therapy 114
- amygdala 218
 fear conditioning 211
- amyloid angiopathy 212
- amyotrophic lateral sclerosis 205
- analgesia 133–4, 158
- analytical psychology 104
- anandamide 208
- anarthria 191
- aneuploidy 27
 Edwards' syndrome 34
- Angelman's syndrome 14
 genomic imprinting 33, 34
- angular gyrus syndrome 192
- annual review of competency progression (ARCP) 1
- anomic aphasia 206
- anorexia nervosa
 defence mechanisms 107
 proportional mortality rate 50, 66
- anosognosia 195
 in stroke patients 201
- antagonists 138
- anterior communicating artery 194
- anterior spinal artery occlusion 172, 205
- anterograde amnesia 196
- anticholinergic effects, antipsychotics 128, 151
- anticholinergics
 schizophrenia 129, 151
 side-effects 132, 156
- anticipation, genetic 12, 33
- anticonvulsants, zero-order kinetics 127, 149
- antidepressants
 chemical structure 131, 154
 discontinuation reaction 127–8, 150
 hippocampal cells, neurotrophin-mediated proliferation of 220
 incontinence treatment 132, 155
 and MAOIs 135, 160
 melatonergic 134, 159
 overdose 128, 150
- proportion of depressed Europeans receiving 55, 73
- selectively serotonergic 127, 149
- tricyclic see tricyclic antidepressants
- antipsychotics
 neuroleptic malignant syndrome 128, 150
 QTc prolongation 127, 149
 side-effects 128, 129, 130, 151, 153
- antisocial outcomes in maltreated children
 genotype 23, 44
- Anton's syndrome 194
- anxiety
 gender factors 56, 73
 lifetime presence 70
 prevalence 56, 72, 73
 psychoanalytic theories of 87, 104
 sensitivity and specificity of a rating scale 61, 79
 stroke patients 201
- apathy in stroke patients 201
- aphasia 161, 11, 191–2
 semantic dementia 204
 in stroke patients 168, 201
- apomorphine challenge, depression 213
- apperceptive agnosia 195
- applying to sit the exam 6
- apraxia 164, 195
- arachidonic acid 42
- arbitrary inference 110
- ariPIPrazole 138, 149
- arousal, regulation of 186, 223
- art therapy 104, 107
- ascending reticular activating system (ARAS) 223
- aspirin and lithium 143
- association studies 43
- associative agnosia 195
- associative comorbidity 68
- associative prosopagnosia 196
- astrocytes 181, 215
- ataxia 177, 210
- atomoxetine
 ADHD 122, 139, 143
 half-life 135, 160
 mechanism of action 122, 143
- attachment styles 91, 108
- attention deficit hyperactivity disorder (ADHD)
 atomoxetine 122, 139, 143
 pharmacology 123, 144
 prevalence in adults 60, 77
 stimulants 118, 122, 139, 143
- attitude research 87, 99, 103
- attitudinal change and fear 84, 100
- atypical antipsychotics 140
- auditory processing 210
- authoritarian personality theory 102
- autism 84, 100
- autonomic nervous system 217
- autosomal aneuploidy 33

- autosomal dominant inheritance 15, 36, 37
autosomal recessive inheritance 21, 37, 43
auxiliary ego, psychodrama 106
aversion therapy 100
- babbling 92, 110
Balint's syndrome 163, 194, 204
Bandura, Albert 111
Barr bodies 13, 32, 34
basal ganglia 183, 218
basic assumptions, group therapy 114
basket cells 210
Beck, Aaron 115
Beck's cognitive distortions 110
bedwetting 76
behavioural activation 97, 115
behavioural couples therapy 85, 101
behavioural difficulties 58, 76
behavioural therapy
 couples 85, 101
 techniques 94, 112
Bell's palsy 222
Bell's phenomenon 222
benign essential tremor 188, 226
benzhexol 151
benzodiazepines
 alcohol withdrawal 132, 156
 withdrawal symptoms 120, 142, 151
benztropine 151
Bion, Wilfred
 containing 108
 group therapy processes 95, 114
biperiden 151
bipolar disorder
 and diabetes, association between 81
 genetics 11, 31
 hypomania, subsyndromal 67
 lamotrigine 131, 154
 lifetime risk 31
 lithium 23, 45, 121, 143
 MS 199
 pharmacology 118, 138
birth order
 genetics 38
 self-concept 102
bitemporal hemianopia 208
blindness, sudden-onset 170, 203
blindsight 163, 194
blood-brain barrier, rate of transport
 through the 117, 138
blood-injection-injury phobia 74
blood-tissue interface, permeable 178, 211
bodily self 101
books 3-4, 6-7
borderline personality 107
Bourneville's disease see tuberous sclerosis
- Bradford Hill's criteria for causal association 80
brain-derived neurotrophic factor (BDNF) 220
breastfeeding 126, 148
broad-sense heritability 31, 44
Broca's aphasia 191, 192
bromocriptine 140, 158
bulbar palsy 205
buprenorphine 144, 159
bupropion 142, 153, 154
 and atomoxetine 143
 chemical structure 154
buspirone
 mechanism of action 124, 138, 145
butyryl cholinesterase 119, 140
- ¹¹C raclopride 178, 212
caffeine
 clozapine metabolism 139
 depersonalization 142
 and lithium 143, 152
 mechanism of action 158
Camberwell Assessment of Needs Schedule 77
cannabinoids, endogenous 175, 208
capture-recapture technique 68
carbamazepine
 and lamotrigine 155
 management of benzodiazepine withdrawal
 symptoms 151
 mechanism of action 138, 142
 St John's wort's effect on 142
cardiac effects, adverse 127, 149
 lithium 131, 154
cardinal personality traits 110
carotid artery syndrome 202
case ascertainment 76
case-control studies 79
case fatality rate 66, 67
castration anxiety 104, 106
cataplexy 203
 genetics 44
 pharmacology 159
catastrophic thinking 110
 panic attacks 111
 stroke patients 168, 201
catatonia 153
catechol-O-methyl transferase (COMT) 221
 schizophrenia 32
catharsis 106
 group therapy 114
cathexis 88, 105
Cattell's personality theory 92, 110
cauda equina syndrome 181, 215
caudate nucleus 206, 218
causal association 62, 80
cause-specific mortality rate 66, 67
cell cycle 10, 29

- centiMorgans (cM) 41
 central achromatopsia 194
 central personality traits 110
 Centre for Neurologic Study–Lability Scale 199
 cerebellar ataxia 210
 cerebellum
 excitatory neurones 176, 210
 lesions 182, 216
 structure 172, 205
 cerebral cortex
 Alzheimer's disease 206
 structure 176, 209
 cerebral glucose metabolism 186, 223
 chaining 100, 112
 change, resistance to 111
 Charcot–Wilbrand syndrome 194
 Chargaff's rule 29
 cheese reaction 123, 141, 144
 child and adolescent mental health, epidemiological surveys 58, 76
 chlordiazepoxide 156
 chlorpromazine
 aliphatic phenothiazine 153
 anticholinergic effects 151
 potency 117, 137
 side-effects 149
 cholinergic deficiency in Alzheimer's disease 211
 chorea 206
 chromatin material, condensation of 20, 42
 chromosome uncoiling 32
 cigarette smoking see smoking
 ciprofloxacin 139
 circumventricular organs 211
 cirrhosis 132, 156
 citalopram 149
 client-centred psychotherapy 115
 clinical trials
 phases 137
 side-effects 117, 137
 clomipramine challenge, depression 213
 clonazepam 142
 depersonalization 142
 management of benzodiazepine withdrawal symptoms 151
 clonidine 145
 and lofexidine 144
 side-effects 145
 tics and ADHD 145
 cloning 10, 29
 clozapine
 efficacy 146
 and fluoxetine 123, 144
 mechanism of action 147
 metabolism 118, 139
 and paroxetine 144
 priapism 209
 psychotic symptoms in Parkinson's disease 141
 side-effects 119, 125, 140, 147, 149
 cluster A personality disorders 68
 cluster B personality disorders 68
 cluster C personality disorders 68
 codeine 158
 codominance 38
 cognitive analytical therapy (CAT) 109
 cognitive behavioural therapy (CBT)
 depression 139
 five-areas approach 95, 113
 sex offender treatment programmes 101
 therapeutic processes 95, 113
 cognitive dissonance 84, 101, 102
 one-dollar/20-dollar experiment 99
 cognitive distortions, Beck's 110
 cognitive therapy 104
 cohort studies 79
 coincidental comorbidity 68
 collective unconscious 104
 communalism, therapeutic communities 107
 comorbidity 68
 coining of term 52, 68
 complex partial seizures 171, 194, 200, 204
 computed tomography (CT), craniopharyngiomas 224
 COMT 221
 schizophrenia 32
 conceptual aphasia 195
 concordance, twin studies 21, 43, 44
 concurrent (episode) comorbidity 68
 condensation 32
 conduction aphasia 191, 192
 conduction apraxia 195
 conformity, group behaviour 112
 conjugation 148
 consanguinity 37
 constitutional psychology 114
 contact hypothesis of prejudice 108
 containing 108
 contextual use of words 112
 continuous amnesia 196
 Continuous Performance Test 225
 conus medullaris syndrome 215
 conventional morality stage 110
 copy number variation 24, 46
 core personality traits 110
 corrective emotional experience 106
 corticobasal degeneration 203
 corticotrophin (ACTH) 214
 cosegregation 40
 couples therapy 87, 104
 covert sensitization 107
 cranial nerves 182, 216
 craniopharyngioma 175, 208, 224
 Creutzfeldt–Jakob disease (CJD) 185, 194, 222
 cri-du-chat syndrome 12, 31

- cross-sectional surveys 80
crossing over 32
crude mortality rate (CMR) 50, 66, 67, 78
crying, pathological 167, 199
crystallized intelligence 213
CYP450 enzyme system 125, 147
cyproheptadine 151
cystic fibrosis 40, 43
cytosine 29
- dantrolene sodium 130, 153
death instinct (thanatos) 104
defence mechanisms 88, 90, 105, 107
Dejerine-Roussy syndrome 226
deliberate self-harm 92, 109
delusional disorder 16, 38
dementia
 half-life of donepezil 130, 152
 incidence 49, 65
 memory loss 196
 Parkinson's disease 170, 203
 see also specific dementias
democratization, therapeutic communities 107
depersonalization 121, 142
depression
 antidepressants see antidepressants
 behavioural activation 97, 115
 and bipolar disorder 67
 Broca's aphasia 192
 DEPRES study 72, 78
 diagnosis, Stirling County Study 57, 74
 ECT 131, 154
 elderly people 63, 78, 80
 epilepsy 200
 EURO-DEP 78
 heritability 45
 hippocampal neurogenesis, deficits in 220
 imipramine 118, 139
 lifetime prevalence 57, 70, 75
 lithium 155
 maternal, as predictor of children's behavioural difficulties 76
 multiple sclerosis 199
 neuroendocrine abnormalities 180, 213
 onset and clinical treatment, time lag between 51, 67
 personality disorders, coexistent 51–2, 68
 phenotypic variation attributable to non-genetic causes 23, 45
 pindolol 159
 postpartum 79
 procedural memory 197
 psychoanalytic therapy 95, 113
 in relatives of probands with bipolar disorder 31
 selegiline 148
 SSRIs 17, 39
- stroke 168, 201
treatment-seeking behaviour 51, 67
Depression Research in European Society (DEPRES)
 study 72, 78
derealization 121, 142
Determinants of Outcome of Severe Mental Disorder (DOSMeD) 72
dexameethasone suppression test 213
di George syndrome 32
diabetes 225
 and psychiatric disorders, association between 63, 81
Diagnostic Interview Schedule (DIS) 71
dialectical behaviour therapy (DBT) 109
diazepam 124, 145
 alcohol withdrawal 156
dichotomous thinking 110
digit span test 176, 210
dilemmas, cognitive analytical therapy 109
diploidy 34
director, psychodrama 106
discontinuation reaction, antidepressants 127–8, 150
discrimination
 and prejudice, distinction between 86, 102
 social identity 105
 theories 85, 102
disintegration anxiety 104, 106
dissociative amnesia 196, 203
disulfiram 142
 and acamprosate 153
 alcohol relapse 130, 152
diuretics and lithium 124, 145
DNA
 mitochondrial 28
 nitrogenous bases 10, 29
 polymerase chain reaction 30
 synthesis from RNA 20, 42
 synthesis of RNA from 10, 28
 unwinding 32
DNA analysis 27
DNA ligase 42
DNA polymerase 1:42
donepezil 140
 half-life 130, 152
 MS 199
 Parkinson's disease 203
dopamine
 metabolism 32, 179, 213
 recreational drug users 220
 synthesis 188, 226
dopamine hydroxylase 221
dopaminergic sites 177, 210
dorsal raphe nucleus 210
dosulepin 150
dothiepin 150
Down's syndrome
 autosomal aneuploidy 33

- Down's syndrome (*Cont.*)
 death, causes of 30
 Robertsonian translocation 35
 downbeat nystagmus 218
 dream work 105
 droperidol 149
 drug problems
 group therapy 107
 hallucinogens 184, 220
 neurotransmitters 184, 220
 pharmacology 122, 143
 prevalence 72
 duloxetine 155
 duplication 35
 duration of illness, family genetic studies 38
 duration of untreated psychosis (DUP) 37
 dysarthria
 hypokinetic 161, 191
 Parkinson's disease 191
- ECG see electrocardiogram
 echolalia 162, 193
 ecological studies 43
 ECT see electroconvulsive therapy
 ectoderm 216
 ectomorphs 114
 Edinburgh Handedness Inventory 193
 Edinburgh Postnatal Depression Scale 79
 Edinger-Westphal nuclei 217
 Edwards' syndrome (18 trisomy) 34
 efficacy of a drug 137
 effort justification dissonance 103
 ego 87, 104, 106
 elderly people
 burden of psychopathology 60, 78
 depression 63, 78, 80
 prevalence of mental disorders 60, 78
 side-effects of drugs 118, 138
 Electra complex 106
 electrocardiogram (ECG) 174, 208
 lithium 131, 154
 electroconvulsive therapy (ECT)
 depression 131, 154
 imipramine 139
 MS 199
 eligibility to sit the exam 1
 Ellis, Albert 109, 115
 Emotional Stroop test 225
 endoderm 216
 endogenous cannabinoids 175, 208
 endomorphs 114
 endophenotypes 14, 35
 schizophrenia 16, 37
 entorhinal cortex 206
 environmental dependence syndrome 204
 Epidemiological Catchment Area (ECA) study 54, 71
 depression 75
 epidemiology
 answers 65–81
 books 3
 preparing for the exam 2, 3
 questions 49–63
 syllabus 2
 epidemiology surveys
 child and adolescent mental health 58, 76
 generations 77
 questionnaires 58, 76
 reliability of questionnaires 57, 74
 third-generation 59, 77
 epilepsy
 depression 200
 family history 166, 198
 seizures 168, 200, 201
 temporal lobe see temporal lobe epilepsy
 epiloia see tuberous sclerosis
 epinephrine 221
 episode (concurrent) comorbidity 68
 episodic memory 164, 196, 197
 MS 199
 epistasis 38, 44
 erectile dysfunction 124, 133, 145, 157
 Erikson, E. 96, 114
 erythromycin 139
 escitalopram 149
 ESEMeD see European Study of the Epidemiology of Mental Disorders
 essential tremor 188, 226
 ethnicity factors
 psychosis 60, 78
 SSRI efficacy 39
 euploidy 34
 EURO-D scale 78
 EURO-DEP 78
 European Study of the Epidemiology of Mental Disorders (ESEMeD) 70, 72
 antidepressants 73
 unmet health-care needs 73
 event-related potentials (ERP) 180
 schizophrenia 180, 213
 exam 1
 afterwards 6
 approach to MCQs 4–6
 eligibility to sit 1
 format 1
 preparation 2–4
 reading list 6–7
 timing 1, 4, 5
 topics/syllabus 1–2
 training requirements 1
 excessive daytime sleepiness 169, 203
 excitotoxicity, glutamate-induced 173, 207
 exposure and response prevention 112

- exposure therapy 100
expressive language disorders 76
extended matching items (EMI) 1
extraversion 114
eye movement desensitization and reprocessing (EMDR) 112
- facial nerve 216, 217
facial nerve palsy 216
facial recognition problems 164, 196
false belief task 103
family genetic studies 16, 43
age correction 38
family aggregation 23, 45
family therapy 107
fantasy, Jungian psychotherapy 104
fear
and attitudinal change 84, 100
conditioning, processing of 177, 211
Feinstein, A.R. 68
fetal alcohol syndrome 181, 215
filter (pathways of care) model 54, 71
finger agnosia 194
finger–nose ataxia 162, 193
first messengers 221
first-order kinetics 149
flooding 100
fluid intelligence 213
fluorescent *in situ* hybridization (FISH) 40
fluoxetine
and atomoxetine 143
cataplexy 159
and clozapine 123, 144
discontinuation syndrome 150
mechanism of action 149
fluphenazine 153
fluvoxamine 39
folate deprivation 37
fragile sites in chromosomes 16, 37
fragile-X syndrome
Barr bodies 34
clinical features 40
fragile sites in chromosomes 37
genotype 13, 24, 34, 47
methylation 32
trinucleotide repeats 24, 40, 47
frame-shift errors 5
frame-shift mutations 37, 40
Freud, Sigmund
agnosia 195
psychotherapy 111
structural model of mind 89, 106
Friedreich ataxia 45
frontal lobe damage 204
frontotemporal dementia 44
furosemide (frusemide) 143, 145
- fugue 107, 203
funnel plots 79
furosemide (frusemide) 143, 145
- GABA 180, 214
pharmacology 120, 134, 142, 159
schizophrenia 32
 $GABA_A$ receptors 212, 219
gabapentin 149
hepatic failure 142
mechanism of action 159
Gage, Phineas 187, 225
galantamine 140
half-life 152
gastrulation 216
gaze-evoked nystagmus 218
gelastic (laughing) seizures 183, 219
gender factors
Freud's structural model of mind 106
identity 103
OCD 81
suicide 61, 79
gender identity 103
gene \times environment interaction models of disease
causation 39
gene cloning 10, 29
gene flow 41
gene frequency 19, 21, 41, 43
general seizures 200
generalized amnesia 196
generativity 114
genetic anticipation 12, 33
genetic drift 41
genetic family studies 16, 43
age correction 38
family aggregation 23, 45
genetics
answers 27–47
books 4, 6
preparing for the exam 2, 3
questions 9–25
syllabus 2
genomic imprinting 33
Angelman's syndrome 34
genotype
distribution 13, 34
frequency 19, 41
Geriatric Mental Scale 78
Gerstmann's syndrome
alexia with agraphia 192
aphasia 161, 192
features 163, 194
Geschwind's syndrome 168, 194, 200
ginkgo biloba 140
Glasgow Coma Scale (GCS) 198
global aphasia 191, 192

- globus pallidus 218
 glossopharyngeal nerve 217
 glucagon 211
 glucose metabolism, cerebral 186, 223
 glucuronyl transferase 126
 glutamate-induced excitotoxicity 173, 207
 glutamic decarboxylase 211
 glutamate receptors 212
 glycine 186, 223
 glycine receptors 212
 Golgi cells 210
 granule cells 210
 grief 109
 group cohesion 106
 group decisions 94, 112
 group membership theory 102
 group polarization 112
 group therapies 89, 90, 106, 107
 Bion's processes 95, 114
 role reversal 104
 groupthink 112
 growth hormone (GH)
 depression 213
 nocturnal surge 186, 224
 guanine 29
 guessing 5
 guided therapy 104
- H70 study 78
 haemophilia 37
 hallucinatory experiences
 epidemiology study 62, 80
 prevalence 57, 75
 hallucinogens 184, 220
 haloperidol
 anticholinergic effects 151
 antipsychotic effect 146
 butyrophенone 153
 mechanism of action 147
 potency 117, 137
 side-effects 125, 147, 149
 handedness 162, 193
 haploidy 34
 Hardy–Weinberg equilibrium 20, 35, 42, 43
 assumptions 19, 41
 head injury, clinical indicators of severity 166, 198
 headache 189, 226
 hemiballismus 206, 224
 hemispheric dominance 193
 Henderson hospital model 107
 hepatic status 121, 142
 heritability 11, 31
 herpes simplex encephalitis (HSE) 194
 hippocampus 225
 blood supply 173, 206
 Hirano bodies 212
- HIV
 DNA synthesis from RNA 42
 western blotting 9, 27
 holding 108
 holophrases 112
 'homothetic' term 85, 102
 homovanillic acid (HVA) 213
 hope, instillation of 107
 Horner's syndrome 218
 human immunodeficiency virus see HIV
 human leukocyte antigens (HLA) 44
 humanistic theories of personality 102
 Huntington's disease
 caudate nucleus, GABA system 206
 EEG 208
 fragile sites in chromosomes 37
 genetic anticipation 33
 genetic testing 25, 47
 glutamate-induced excitotoxicity 207
 procedural memory 197
 trinucleotide repeats 40, 47
 hydrophilic drugs, absorption 137
 hydroxy indole acetic acid (5HIAA) 209
 hypercortisolism in depression 213
 hypermetamorphosis 204
 hypertension 172, 205
 hypocretin 203
 hypoglossal nerve 216, 217
 hypokalaemia 154
 hypokinetic dysarthria 161, 191
 hypomania
 Psychosis Screening Questionnaire 75
 subsyndromal 51, 67
 hypothalamus 225
 tumours 219
 hysteria 107
- id 87, 104, 106
 ideal self 101
 idealization of therapist, group therapy 114
 ideational apraxia (IDA) 195
 identity 114
 ideomotor apraxia 195
 idiographic personality theories 102
 illiteracy, acquired 192
 illusion of out-group homogeneity 108
 imipramine 118, 139
 cataplexy 159
 impotence see erectile dysfunction
 imprinting, genetic 33
 Angelman's syndrome 34
 in-frame mutations 37, 40
 inception cohorts 80
 incidence 49, 65
 cross-sectional surveys 80
 and prevalence, relationship between 50, 54, 66, 70

- subgroup of a population 50, 66
incidence density 77
incomplete penetrance 38
incontinence 132, 155
independent assortment, principle of 36
individualism 104
indometacin 143, 155
infant mortality rate 78
infantile neurosis 105
inferior colliculus lesions 193
inferior olfactory lesions 193
inferior parietal cortex 225
inositol 155
insecure attachment 108
insomnia 126, 148
instillation of hope 107
insulin 211
integrity 114
intellectualization 105
intelligence see IQ/intelligence
internal carotid artery emboli 203
International Pilot Study on Schizophrenia (IPSS) 69, 71, 72
interpersonal psychotherapy (IPT) 107, 109
interstitial nucleus of the anterior hypothalamus 214
intestinal transit of orally administered drugs 137
intimacy stage 114
intraocular pressure 208
introversion 114
inversion 35
IQ/intelligence
heritability 21, 43
premorbid 171, 204
tests 180, 213
irreminiscence 194
Isle of Wight Study 58, 76
isochromosomes 35
isolation 114
isolation aphasia 191
isoniazid 160
isthmus of thyroid 224

jerk nystagmus 218
journals 2
Jung, Carl
psychotherapy 88, 104
type trait theory of personality 96, 114

Kaplan-Meier curves 79
kappa statistics 79
Kaufman Adolescent and Adult Intelligence Test 213
Kayser-Fleischer (KF) ring 215
ketamine 209
Klinefelter's syndrome 34
Kleinian psychoanalysis 88, 105
Klerman, Gerald L. 109

Klüver-Bucy syndrome 204
Kohlberg's stages of moral development 110
Korsakoff's syndrome 197, 204

lamotrigine
depersonalization 142
first-order kinetics 149
mechanism of action 131, 142, 154
plasma levels 132, 155
side-effects 131, 154
language development 94, 112
laryngeal dystonia 146
lateral geniculate nucleus 210
laughing, pathological 167, 199
laughing (gelastic) seizures 183, 219
Leber hereditary optic neuropathy 28
lenticular nucleus 218
leptin 179, 212
levodopa
and selegiline 148
side-effects 119, 140, 141, 158
levodopa challenge, depression 213
Lewy bodies 181, 214
Lewy body disease 29, 141
life tables 38
lifetime comorbidity 68
lifetime morbidity risk (LMR) 65, 69, 70
schizophrenia 53, 70
lifetime presence of mental health problems 54, 70
lifetime prevalence 65, 69
depression 75
ligand-gated ion channels 178, 183, 212, 219
light reflex pathway 182, 217
likelihood nomograms 79
Likert scale 99
limb-kinetic apraxia 164, 195
Linehan, Marsha M. 109
linkage analysis 40, 43
Huntington's disease 47
LOD score 18–19, 41
lipophilic drugs, absorption 137
lithium
bipolar disorder 23, 45, 121, 143
and diuretics 124, 145
ECG changes 131, 154
hepatic failure 142
interactions with other drugs 121, 143
mechanism of action 138, 142
side-effects 124, 129, 152, 155–6
therapeutic index 125, 146
livedo reticularis 158
localized amnesia 196
locus coeruleus 210
locus heterogeneity 38, 40
LOD score 18–19, 41
lofexidine 123, 144

- logoclonia 193
 long-term memory 210
 long-term potentiation (LTP) 177, 210
 lorazepam 156
 loxapine 153
 LSD 184, 220
 lumbar puncture 226
 Lyon's hypothesis 32
- magnetic resonance imaging (MRI),
 craniopharyngiomas 224
 magnification 110
 Main's Adult Attachment Interview 108
 mannitol 143
 Marfan's syndrome 40
 Martell, Christopher 115
 Martin-Bell syndrome see fragile-X syndrome
 Mayo Clinic classification of dysarthria 191
 medial geniculate body 210
 medial temporal cortex 194
 melanocyte-stimulating hormones (MSH) 214
 MELAS 28, 33
 melatonin 159
 memantine 140
 excitotoxicity hypothesis 207
 mechanism of action 125, 146
 memory see episodic memory; procedural memory;
 semantic memory; working memory
 Mendel, Gregor Johann 36
 Mendelian disorders, genetics compared with that of
 schizophrenia 24, 46
 Mendelian inheritance 15, 36
 mesoderm 216
 mesolimbic dopamine system 220
 mesomorphs 114
 meta-analyses, genetic association studies 39
 metacognition 175, 209
 metafemales 34
 methyl phenyl tetrahydropyridine (MPTP) 209
 methylation 32
 methylene dioxy methamphetamine (MDMA) 209
 methylphenidate 139, 143
 methylxanthines 134, 158
 middle cerebral artery syndrome 202
 Milgram's obedience experiments 94, 111
 minimization 110
 mirror-image phenomenon 108
 mirror recognition 103
 mirroring, group therapy 114
 mis-sense mutations 37
 mitochondrial DNA 28
 mitochondrial inheritance 37
 MELAS 33
 mitosis
 equatorial alignment of chromosomes 20, 42
 phases 20, 42
- re-entering 29
 mock tests 3, 5
 moclobemide 123, 141, 144
 modafinil 159, 203
 modification 28
 monoamine oxidase (MAO) 221
 monoamine oxidase inhibitors (MAOIs) 120, 141
 atomoxetine contraindicated 143
 depression 135, 139, 160
 monogenic diseases 36
 mononeuritis multiplex 225
 mood disorders 70, 72
see also specific disorders
 moral development, stages of 110
 morphine 158
 mortality rates 50, 66–7
 motivation enhancement therapy 101
 motor neurone disease 205
 multifactorial diseases 15, 36
 threshold model 17, 38
 multiple attachments 108
 multiple choice questions (MCQs)
 approach to 4–6
 format of exam 1
 multiple sclerosis (MS) 199
 multisystem atrophy 203
 muscarinic receptors 212, 219
 music therapy 107
 myotonic dystrophy
 CTG expansion 40
 fragile sites in chromosomes 37
- n-back test 175, 209
 naloxone 142, 143, 158
 buprenorphine overdose 144
 mechanism of action 159
 opioid toxicity 122, 143–4
 naltrexone 143, 158
 alcohol withdrawal 142
 narcolepsy 203
 pharmacology 134, 159
 narcolepsy–cataplexy syndrome 203
 genetics 44
 narrow-sense heritability 31, 44
 National Adult Reading Test (NART) 204
 National Comorbidity Survey (NCS) 75
 National Comorbidity Survey Replication (NCS-R)
 depression 75
 panic attacks 73
 National Epidemiological Survey of Alcoholism and Related
 Conditions (NESARC) 67, 68
 depression 75
 National Institute of Mental Health Depression Study 139
 natural selection 41
 negative practice 112
 negative predictive value 79

- negative therapeutic reaction 111
negative transference 111
nerve growth factor (NGF) 220
Netherlands Mental Health Survey and Incidence Study (NEMESIS) 72, 78
neuroacanthocytosis 219
neuroectoderm 216
neurofibromatosis 36, 47
neurohormones 211
neuroleptic malignant syndrome (NMS) 128, 146, 150
 dantrolene sodium 153
neuroleptics, typical 124, 146
neuromodulators 211
neuronal plate 216
neurones
 embryonic development 182, 216
 resting membrane potential 186, 223
neuropsychiatric interview (NPI) 162, 193
neurosciences
 answers 191–226
 books 3–4, 6
 preparing for the exam 2, 3
 questions 161–89
 syllabus 1–2
neurotic repetitions 109
neurotransmitters 211
 pharmacology 138
 physiological antagonist for
 acetylcholine 178, 211
 recreational drug users 184, 220
neurotrophins 184, 211, 220
nicotinic cholinergic receptors 212, 219
nomifensine 158
nominal aphasia 206
nomothetic personality theories 102
non-coding sequences 27
non-contingent gene–disorder association 39
non-steroidal anti-inflammatory drugs (NSAIDs),
 interactions with lithium 121, 143
nonsense mutations 37
noradrenalin, synthesis of adrenalin from 184, 221
norepinephrine 221
 physiological antagonist for acetylcholine 211
 sympathetic nervous system 217
norepinephrine receptors 219
normal-pressure hydrocephalus (NPH) 207
northern blotting 27
notochord 216
NREM sleep 169, 202, 207
 growth hormone surge 224
nucleic acids, components 20, 42
nucleosides 29
nucleotides 29
nucleus accumbens 218
nucleus basalis of Meynert 210
Alzheimer's disease 206, 211
number, concept of 103
nystagmus 183, 218
obedience
 experiments 94, 111
 group behaviour 112
object permanence 103
object relations theory 105
obsessive–compulsive disorder (OCD)
 defence mechanisms 107
 exposure and response prevention 112
 lifetime prevalence 63, 81
 prevalence in men versus women 73
 procedural memory 197
occupational therapy groups 107
oculomotor nerve 217
odds ratio, psychiatric genetic association studies 39
oedipal complex 106
oedipal phase 106
Office of National Statistics–Psychiatric Morbidity Survey 75
olanzapine
 mechanism of action 138
 side-effects 119, 140, 149
olivopontocerebellar degeneration 203
 procedural memory 197
one-dollar/20-dollar experiment 99
Opalski cells 181, 215
open cohorts 80
operant conditioning 100
opioids 133–4, 158
 toxicity 122–3, 143–4
oral contraceptives 142, 155
orally administered drugs, absorption 117, 137
orbitofrontal cortex 225
orexin 203
orientation 193
orphenadrine 151
Osgood's Semantic Differential Scale 103
oxazepam
 alcohol withdrawal 156
 hepatic reserve, low 142
 metabolism 148
oxybutinin 151
P-glycoprotein 137
P300 180, 213
pair-wise concordance, twin studies 21, 43
palilalia 193
paliperidone 142
panic attacks
 cognitive distortions 93, 110, 111
 presentation 56, 73
panic disorder 73
 epidemiology 65
 mean age of onset 56, 73
paracentric inversion 35

- paradoxical injunction 107
 paragrammatism 192
 parasympathetic nervous system 182, 217
 parent-of-origin phenomenon 12, 33
 Parental Bonding Instrument (PBI) 95, 113
 parietal lobe damage 202, 204
 parieto-occipital damage 204
 'Parkinson plus' syndromes 170, 203
 Parkinson's disease (PD)
 cell cycle 29
 dementia 170, 203
 excitotoxicity hypothesis 207
 hypokinetic dysarthria 191
 model 176, 209
 'Parkinson plus' syndromes 170, 203
 pharmacology 119, 134, 140–1, 158
 procedural memory 197
 Parkinsonian tremor 226
 paroxetine
 anticholinergic activity 149
 and atomoxetine 143
 and clozapine 144
 discontinuation syndrome 128, 150
 efficacy 39
 partial agonists 118, 138
 benzodiazepines 120, 142
 smoking cessation 133, 157
 partial opioid agonists 123, 144
 partial seizures 200
 Patau's syndrome 11, 30
 path analysis 44
 pathological laughing and crying 167, 199
 Pathological Laughter and Crying Scale 199
 pathways of care (filter) model 54, 71
 penetrance rate 38
 pentazocine 159
 pericentric inversion 35
 period prevalence 66
 schizophrenia 70
 permissiveness, therapeutic communities 107
 perphenazine 153
 persecutory anxiety 106
 persistence 54, 71
 personality disorders
 depression, coexistent 51–2, 68
 Jung 96, 114
 prevalence 68
 personality theories 85, 92, 102, 110
 persuasion and fear 84, 100
 persuasive communication 84, 100
 pharmacology
 answers 137–60
 books 3, 6
 preparing for the exam 2
 questions 117–35
 syllabus 2
 phase 1 and 2 metabolism of drugs 126, 148
 phenelzine 141, 160
 phenocopy 41
 phenylketonuria 36
 phenylethanolamine N-methyltransferase (PNMT) 221
 phenytoin
 and lamotrigine 155
 therapeutic index 125
 zero-order kinetics 149
 phobias
 gaining insight into 90, 107
 lifetime presence 70
 see also specific phobias
 phonological loop 197
 physiological antagonism 178, 211
 Pick's disease 29, 212
 pimozide 149, 153
 pindolol 138, 159
 pleiotropy 40
 point mutation 37
 point prevalence 66
 cross-sectional surveys 80
 schizophrenia 70
 polygenic diseases 36
 polymerase chain reaction (PCR) 10, 30
 polymorphism 27
 of serotonin transporter protein 9, 27
 polyuria 156
 population attributable fraction 70
 for seasonal birth in schizophrenia incidence 53, 70
 population distribution curve, multifactorial diseases 17, 38
 positive connotation 107
 positive group identification 106
 positive predictive value 79
 positron emission tomography (PET) 223
 post-concussion syndrome (PCS) 166, 198
 post-traumatic stress disorder (PTSD)
 epidemiological study 61, 79
 eye movement desensitization and reprocessing 112
 postconventional morality stage 110
 posterior cerebral circulation 205
 posterior inferior cerebellar artery, occlusion 174, 207
 postpartum depression 79
 postpartum psychosis 79
 potency of a drug 117, 137
 practice tests 3, 5
 Prader–Willi syndrome 33, 34
 pramipexole 140
 precision of a test 80
 precocious puberty 219
 preconventional morality stage 110
 prejudice
 and discrimination, distinction between 86, 102
 reducing 90, 108
 theories 85, 102
 premature ejaculation 101

- premature mortality 60, 78
premutation 34
 fragile-X syndrome 40
prenatal testing, Huntington's disease 47
preparation for the exam 2–4
prevalence 65
 cross-sectional surveys 80
 and incidence, relationship between 50, 54, 66, 70
 lifetime 65, 69
 see also specific disorders
priapism 175, 209
primary generalized seizures 200
primase 42
prion proteins 185, 222
PRISM psychosis study 78
pro-opiomelanocortin (POMC) 180, 214
proband-wise concordance, twin studies 21, 43
problem-solving groups 107
procedural memory 165, 197
 MS 199
procyclidine 151, 152
productivity of a drug 137
progressive supranuclear palsy
 cell cycle 29
 ‘Parkinson plus’ syndrome 203
 procedural memory 197
proneurotrophins 220
proportional mortality rate 50, 66, 67
propositions, language development 112
propoxyphene 158
propranolol 138, 152
prosopagnosia 196
protagonist, psychodrama 89, 106
protein analysis 9, 27
pseudobulbar palsy 172, 205
pseudoseizures 201
psoriasis 132, 155
psychiatric disorders, prevalence
 Isle of Wight study 58, 76
psychiatric genetics see genetics
Psychiatric Morbidity Survey 75
psychiatric symptoms 57, 75
 see also specific symptoms
psychiatrists, proportion of people seeking
 help from 56, 73
psychoanalytic theories of personality 102
psychoanalytic therapy
 depression 95, 113
 Jungian modification 88, 104
psychodrama 107
 protagonist 89, 106
 role reversal 104
psychodynamic theory 106
psychoeducational groups 107
psychology see advanced psychology
psychopharmacology see pharmacology
psychosis
 ethnicity factors 60, 78
 incidence 49, 60, 65, 78
 Parkinson's disease 119, 141
 postpartum 79
Psychosis Screening Questionnaire 75
psychotherapy 111
 client-centred 115
 supportive 93, 111
psychotropics
 absorption 127, 150
 breastfeeding 126, 148
publication bias 79
pure word deafness 192
purines 29
Purkinje cells 210
putamen 218
pyramidal decussation 193
pyridoxine deficiency 178, 211
pyrimidines 29
QTc prolongation 127, 149
quadrantanopias 208
questionnaires in epidemiological surveys 58, 76
quetiapine
 efficacy 146
 mechanism of action 147
 psychotic symptoms in Parkinson's disease 141
 side-effects 149
racism 102
ractopride 178, 212
random guessing 5
raphe nuclei 222
Rathke's pouch 224
rational emotive therapy 109, 115
rationalization 105
Raven's Progressive Matrix 213
reading
 acquired defects 162, 192
 for exam 2, 3–4, 6–7
 National Adult Reading Test 204
reality confrontation, therapeutic communities 107
reboxetine 141
recall bias 70
 depression 75
receiver-operator curves 61, 79
reciprocal determinism 109
reciprocal inhibition 109
reciprocal translocation 35
reciprocity negotiation 104
reframing 107
regression 104
relative deprivation theory 102
REM sleep 169, 202
repetition compulsion 104

- replication 28
 repression 104
 resistance to change 111
 respondent bias 70
 resting membrane potential, neurones 186, 223
 restrictive enzymes 29
 restriction fragment length polymorphism 40
 retrograde amnesia 196
 duration 198
 reverse transcriptase 42
 revision courses 3
 reward orientation 110
 Rey Osterrieth Complex Figure Test 206
 risky shift 112
 risperidone
 mechanism of action 147
 priapism 209
 side-effects 149
 rivastigmine 140
 half-life 152
 RNA
 DNA synthesis from 20, 42
 nitrogenous bases 10, 29
 synthesis from DNA 10, 28
 RNA analysis
 northern blotting 27
 RNA polymerase 42
 Robertsonian translocation 35
 rofecoxib 143
 Rogers, Carl 96, 115
 role conversion 114
 role deficits 109
 role disputes 109
 role reversal 104
 role transitions 109
 Romberg's test 210
 ropinirole 159
 Rorschach's Test 225
 Ryle, Gilbert 109
 sadism 104
 St John's wort 121, 142
 Sally Anne task 103
 scalograms 103
 scape-goating, group therapy 114
 schizoaffective disorder 81
 schizoid personality 107
 schizophrenia
 developing and developed countries, differential outcome between 55, 71
 and diabetes, association between 63, 81
 endophenotypes 16, 37
 epidemiology study 62, 80
 genes implicated in 24, 46
 genetics compared with that of simple Mendelian disorders 24, 46
 glycine 223
 incidence 52, 53, 69, 70
 lifetime morbidity risk 53, 70
 male to female prevalence ratio 53, 70
 male to female risk ratio 52, 69
 in migrants compared to a native population 53, 69
 P300 abnormalities 180, 213
 pharmacology 121, 124, 129, 142, 146
 polymerase chain reaction 11
 polymorphism 12, 32
 population attributable fraction for seasonal birth 53, 70
 prevalence and incidence, relationship between 50, 66
 smoking levels 153
 suicide 51, 67, 124, 146
 urban inhabitants 69
 WHO-sponsored survey of outcome 55, 72
 scrapie-associated prion protein 222
 sculpting 104
 second messengers 185, 221
 secondary personality traits 110
 secure attachment 108
 segregation, principle of 36, 40
 seizures
 classification 200
 with consciousness preserved 167, 200
 gelastic (laughing) 183, 219
 non-epileptic 168, 201
 after road traffic accidents 198
 selective abstraction 110
 selective amnesia 196
 selective serotonin reuptake inhibitors (SSRIs)
 augmentation 135, 159
 efficacy 17, 39
 side-effects 151, 156
 selegiline 140, 141
 mechanism of action 126, 148, 160
 self, sense of 114
 self-concept, development 85, 101
 self-consciousness 101
 self-esteem
 evaluative nature 101
 self-actualization 115
 social identity theory 105
 self-harm, deliberate 92, 109
 self-image 101
 self-monitoring 112
 self-object relationship 105
 self-recognition
 development of 86, 103
 touching the dot phenomenon 86, 103
 semantic dementia 204
 semantic memory 196, 197, 204
 MS 199
 sensitivity of a diagnostic test 61, 79
 sensory ataxia 210

- separation anxiety 104, 106
serotonin 185, 221
serotonin release, reduction of 179, 212
serotonin reuptake transporter (SERT) 222
serotonin syndrome 141
 dantrolene 153
serotonin system in the brain 185, 222
serotonin transporter protein polymorphisms 9, 27
sertindole 149
sertraline 149
set-shifting capacity 173, 206
severe affective disorder
 lifetime risk 31
 in relatives of probands with bipolar disorder 11, 31
severity of illness, family genetic studies 38
sex offender therapy 101
sexual orientation 181, 214
shaping 100
Shapiro, Francine 112
Sheldon, William Herbert 114
Shy–Drager syndrome 203
sick sinus syndrome 154
sickle cell anaemia 37, 40
side-effects of drugs
 clinical trials 117, 137
 in elderly people 118, 138
 see also specific drugs
sildenafil 124, 145, 157
silent mutations 37
simple partial seizures 200
simultanagnosia 194
single nucleotide polymorphisms (SNPs) 27
sleep
 growth hormone surge during 186, 224
 stages 169, 202
sleep disorders 126, 134, 148, 159, 169, 202–3
 polysomnography 174, 207
sleep terrors 169, 202
sleep–wake cycle, regulation of 186, 223
smoking
 antipsychotic side-effects 130, 153
 clozapine metabolism 139
 quitting 133, 153, 157
 schizophrenic patients 153
snags, cognitive analytical therapy 109
social categories learnt by children 86, 103
social identity theory (SIT) 89, 102, 105
social learning theory 93, 111
social phobia 73
sociograms 103
sociometry 103
Socratic questioning 104
somatic syndrome 213
somatoform disorders 107
source personality traits 110
Southern blotting 27
spastic bulbar palsy see pseudobulbar palsy
specific mortality rate 66, 67
specificity of a diagnostic test 61, 79
speech problems 161, 162, 191–2, 193
speech testing 191
speech therapy 191
sphincter disturbance 216
spinal artery occlusion 172, 205
spinal cord, posterior column 183, 218
spinal muscular disease 37
spinothalamic tracts 218
splicing 10, 28
squeeze–pause techniques 101
stagnation 114
standardized mortality rate 50, 66, 67
Stanford–Binet Scale 213
stellate cells 210
Stevens–Johnson syndrome 154
stimulants, ADHD 118, 122, 139, 143
stimulus control 112
Stirling County Study 57, 74, 75
stop–start techniques 101
stress urinary incontinence (SUI) 155
striatum 218
stroke 168–9, 173, 201–2
 anomic aphasia 206
 depression 168, 201
Stroop Colour–Word Test 225
strychnine-sensitive glycine receptor 223
study leave 6
stuttering 193
subarachnoid haemorrhage (SAH) 226
subfornicular organ, blood–tissue interface 211
substance abuse see alcohol problems;
 drug problems
substantia nigra 206, 218
substitution mutations 15, 37
subthalamic nucleus lesions 173, 206, 224
suicidal ideation
 risk factors 59, 76–7
 transition from ideas to plans or attempts 59, 76
suicide
 age factors 61, 79
 epilepsy 200
 gender factors 61, 79
 MS 199
 schizophrenia 51, 67, 124, 146
sulindac 143
suprile 149
superego 87, 104, 106
superego anxiety 104
superior colliculus lesions 193
superior temporal cortex 225
support groups 107
supportive psychotherapy 93, 111
suprachiasmatic nucleus (SCN) 214

- surface personality traits 110
 Sydenham's chorea 206
 syllabus 1–2
 sympathetic nervous system 217
 synapses 105
 syntetic loci 40
 synthesis of RNA from DNA 10, 28
 synuclein 214
 synucleopathies 214
 systematized amnesia 196
 systems-centred groups 107
 tacrine 140
 tardive dyskinesia (TD) 146, 156
 tau protein
 Alzheimer's disease 9, 28, 44
 frontotemporal dementia 44
 Tavistock-model analytic groups 107
 telegraphic speech 112, 192
 temporal lobe damage 204
 temporal lobe epilepsy
 cell cycle 29
 Geschwind's syndrome 200
 suicide 200
 terazosin 151
 termination reaction 111
 testicular feminization syndrome 34
 thalamus infarcts 226
 thalamic lesions 193
 thalamic pain syndrome 226
 thalamus, nuclei 176, 210
 thanatos (death instinct) 104
 theophylline 158
 theory of mind 86, 103
 therapeutic communities, principles 90, 107
 therapeutic dramatization see psychodrama
 therapeutic indices 125, 146
 thiamine 197
 thioridazine
 anticholinergic effects 151
 piperidine phenothiazine 153
 side-effects 149
 thiothixene 153
 threshold model 17, 38
 Thurstone scale 99
 thymidine 37
 thymine 29
 thyroid hormone 212
 thyroid-stimulating hormone (TSH),
 depression 213
 tiagabine 159
 tics
 negative practice 112
 pharmacology 123, 145
 stimulants contraindicated 139
 timing of exam 1, 4, 5
 tobacco see cigarette smoking
 token economy 100
 tolcapone 158
 tonic-clonic seizures 200
 topiramate 159
 torsades de pointes 149
 touching the dot phenomenon 86, 103
 Tourette's syndrome
 negative practice 112
 pharmacology 145
 Tower of London test 206
 toxic epidermal necrolysis 154
 trail making test 193
 training requirements 1
 tramadol 159
 transcortical motor aphasia 191, 192, 193
 transcortical sensory aphasia 191, 192, 193
 transcription 28
 transcriptomes 24, 46
 transference 105
 negative 111
 transference neurosis 105
 transference regression 105
 transient global amnesia (TGA) 205
 transition 37
 translation 28
 amino acid activation 28
 translocation
 reciprocal 35
 Robertsonian 35
 transversion 37
 tranylcypromine 141
 traps, cognitive analytical therapy 109
 traumatic brain injury 163, 193
 trazodone 209
 triamterene 145
 triangulation 107
 tricyclic antidepressants (TCAs)
 discontinuation syndrome 150
 overdose 128, 150
 side-effects 151
 tyramine action 141
 trifluperazine 149, 153
 trihexphenidyl 151
 trinucleotide repeat syndromes
 CAG expansion 40
 CTG expansion 40
 genetic anticipation 33
 premutation 34
 triple-X syndrome 34
 trochlear nerve 216
 L-tryptophan 159
 tryptophan depletion test 222
 tuberous sclerosis 39
 tunnel vision 208
 Turner's syndrome 34, 35

- twin studies, pair-wise versus proband-wise concordance 21, 43
tyramine 120, 123, 141, 144
tyrosine 221, 226
tyrosine hydroxylase 221

ubiquitin 214
UK 700 study 78
unconsciousness 166, 198
uniformity, law of 36
universal ethical orientation 110
unmet health-care needs 59, 73, 77
upbeat nystagmus 218
uracil 29
utilization behaviour 204

vagus nerve 217
validity of a test 80
valproate
 first-order kinetics 149
 and lamotrigine 154, 155
 mechanism of action 142
 neural tube 216
 side-effects 154
vanillyl mandelic acid (VMA) 209
varenicline 157
variable expression 38
velo cardio facial syndrome (VCFS) 32
venlafaxine 150, 151
ventral striatum 218
ventral tegmental area (VTA) 210
verbal use of language 112
vertebrobasilar insufficiency 205
vestibulocochlear nerve 216
vicarious learning 109
 social learning theory 111
vigabatrin 142, 159
vigour of a drug 137
visual processing 176, 210
visuospatial sketchpad 197
volume of distribution of a drug 125, 147

Wallenberg's syndrome 207
warfarin 142
Wechsler Adult Intelligence Scale 213
Wechsler Intelligence Scale for Children 213
weighted age method 38
Weinberger's weighted age method 38
Weissman, Myrna M. 109
Wernicke–Korsakoff syndrome 194, 197
Wernicke's aphasia 191, 192
western blotting 9, 27
Williams, C. 113
Wilson's disease 215
Winnicott, Donald 108
Wisconsin Card Sorting Test 206
withdrawal symptoms, benzodiazepines 120, 142
Wolpe, Joseph 109
work place based assessments (WPBA) 1
working memory 197
 cerebellum 216
 digit span test 210
 GABA 32, 214
 MS 199
 n-back test 209
 schizophrenia 12, 32
working through 108
World Mental Health Survey 67, 70
 ADHD prevalence 60, 77
 findings 55, 72
writing, acquired defects 162, 192

X-linked dominant inheritance 37
X-linked recessive inheritance 37

years of potential life lost (YPLL) 78
Yentreve® 155
Yerkes–Dodson law 100

zero-order kinetics 127, 149
zolpidem 148
zotepine 149



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Best of Five MCQs for MRCPsych Paper 3

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FOREWORD

Do you ever look at the breadth of the MRCPsych curriculum and find your heart sinking? As a candidate it can feel that there is just too much to learn – so many topics – so many books and papers – where do you even begin? This book represents an excellent way of starting. It forensically approaches the MRCPsych Paper 3 curriculum and identifies areas that can be easily examined using best of five-style MCQs. Doing this is essential to reduce and focus down on what and how you learn. This book will help you impose a structure on your entire approach to revising for the exam. You can use it both to test what you have learned to date – but also crucially to help you direct and plan your learning also. It will help you focus your reading and learning.

You will learn that the best approach is to prepare with the exam in mind. This involves both learning the sort of information required and also considering how you will deliver this effectively under exam conditions. Addressing all the component parts of the MCQ and containing 450 questions and answers *Best of Five MCQs for MRCPsych Paper 3* goes a long way towards focusing and structuring your revision. If a candidate used this book to identify key topics and then supplemented the answers here with short additional reading, I believe they would be well-placed to pass this component of the exam.

But of course, knowledge is only one part of passing the exam. The authors know this and provide a helpful overview to the whole exam, and how to prepare for it. Candidates are advised how best to plan their revision, structure their learning, work alone and with others to revise – and reminds readers that there really is life afterwards! It will make it less likely you fail this part of the exam. But if you do, remind yourself why you are interested in psychiatry and in your patients. Step back and try to keep things in perspective, take a holiday, talk to family and friends. Time is a big healer. Then when you're ready, pick the right time to do the exam – that works for you and your life. Sit it for your own reasons rather than because others expect it of you. Use the techniques and focus this book gives you to pass. It will certainly help.

Professor Chris Williams
Professor of Psychosocial Psychiatry
University of Glasgow

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This third book in MRCPsych MCQ series has been helped by numerous trainees attending SPMM Course and PassAppraisal course in London for paper 3 revision. We are grateful for all trainees, who are mostly members of the Royal College of Psychiatrists now, for supporting our work in producing this series.

Special thanks to Dr. Adil Akram for reviewing two chapters (Forensic and General psychiatry) in this book. Dr Rinku Alam provided constructive insight into psychotherapy chapter. Dr Sunanda Ghosh offered very helpful advice on child psychiatry. Dr Rahul Tomar provided immensely practical suggestions in rewriting some questions in the chapter on old age psychiatry. We are grateful to Dr Agnihotri and Dr Chekuri for reviewing the addictions chapter; Dr Jim Crabb and Dr Adam Burnell for reviewing the organic and liaison psychiatry chapter and Dr Everett Julyan for reviewing the psychotherapy. We are indebted to Professor Chris Williams for providing the foreword.

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CONTENTS

Introduction	1
1 General adult psychiatry	
Questions	9
Answers	21
2 Forensic and rehabilitation psychiatry	
Questions	35
Answers	45
3 Child psychiatry and learning disabilities	
Questions	59
Answers	69
4 Old age psychiatry	
Questions	81
Answers	91
5 Substance use disorders	
Questions	105
Answers	115
6 Organic, liaison, and perinatal psychiatry	
Questions	131
Answers	141
7 Psychotherapy	
Questions	155
Answers	165

8	Basic statistics	
Questions		183
Answers		209
<hr/>		
Index		239

INTRODUCTION

THE MRCPSYCH PAPER 3

MRCPsych exams are the most important exams a psychiatry trainee in the UK will sit during his or her career. Passing the MRCPsych is the most perceptible of the criteria that demonstrate the achievement of a number of competencies during the training. Since spring 2008, there has been a significant change in the pattern of the exam. The structure, syllabus, and the format of questions have changed significantly.

WHO CAN SIT THE EXAM?

The details are clearly given in the Royal College website. They are summarized below for quick reference. Please note that these details are subject to change and so we recommend checking with information at www.rcpsych.ac.uk before you apply.

Training requirements^{1,2}

The college has brought out new exam regulations that came into effect on January 2009. Candidates must have completed the mandatory training period of 12 months of post foundation training in psychiatry by the date of sitting the written exams. The recommended time frame for attempting Paper 3 is when the candidate is 18–30 months into training. Posts must be part of a programme of training approved by PMETB OR recognized by the Hospital or Trusts as having specific time, programme (journal clubs, grand rounds, teaching, supervision, etc.), and funds allocated for training. Individual posts can be of either 4 or 6 months' duration. In addition, the college also has placed emphasis on successful completion of annual review of competency progression (ARCP) and other workplace based assessments (WPBA) to be eligible for training. The exact details need be confirmed from the college website as they are subject to regular reviews.

WHAT IS PAPER 3?

The MRCPsych Paper 3 is 3 hours long and contains 200 questions. The paper consists of multiple choice questions (MCQs = 75%) and extended matching items (EMI = 25%). MCQs are in the 'best of five' (BOF) format. A BOF MCQ comprises a question stem of varying length, followed by a list of five options. Candidates should choose the single best option that answers the question.

The college has retained the EMI format from the previous pattern in the new format. An EMI comprises of a specific theme (sometimes with a short description), followed by a set of answer choices (often in an alphabetical order) and a lead-in statement explaining what the candidate is being asked to do. This lead-in statement is then followed by a question list, set out in a logical order. The questions may be asked in form of clinical vignettes. The candidate may be required to choose more than one answer from the list of options for an individual question; in this case, the number of correct options will be clearly marked adjacent to the question.

Breakdown of questions, Paper 3 (Clinical Topics)

The Clinical Topics will be approximately two-thirds of the paper. The Critical Review component will make up approximately one-third of the paper.

General adult psychiatry	32%
• Classification of disease, preventative strategies	
• Presentation of illness and treatment	
• Hospital liaison psychiatry	
• Neuropsychiatry	
• Medicine relevant to psychiatry and HIV	
• Research	
Old age psychiatry	15%
Addictions	11%
Child and adolescent psychiatry	15%
Forensic psychiatry	9%
Learning disability	10%
Psychotherapy and psychopathology	8%

HOW TO PREPARE FOR THE EXAM

The MRCPsych journey starts the very day the training starts. Preparation should be directed towards gaining the requirements towards sitting the exam, as well as getting a good knowledge of the theories that underlie the principles and practice of psychiatry. Preparation for the exams should be cumulative – i.e. the knowledge gained during the preparation for papers 1 and 2 should ideally contribute to your performance in paper 3. The college makes it clear that that the emphasis for paper 3 is going to be on clinical topics. So it is likely that a person, who has had a mixture of experience in specialty posts, such as forensics, addictions, psychotherapy, and learning disability, would be at advantage. Those who have not had the opportunity to spend time in specialty areas may find it difficult to get time to read these topics. It is essential that these topics don't get left out.

A topic that may get left out, because it is not specifically attended to is critical appraisal. Critical appraisal of research is a core skill that is to be developed early on in training. This is essential to understand the rationale behind our daily 'evidence-based practice'. This could be best done by arranging focused 'journal clubs' with special emphasis on critical appraisal with a specific type of research article on each occasion. For example, if there are six trainees in a unit, they could divide topics among themselves, so that each person gets the opportunity to prepare and present a particular type of research paper each week. So if the first trainee presents a paper on a randomized controlled trial, the second person presents a paper on meta-analysis the following week, the third person presents a paper on economic analysis in the third week, etc. This would also mean that each person would be an expert in the type of paper he/she presented and can impart the knowledge to others. Focused journal clubs can be particularly difficult to organize and will need full cooperation from the consultants, college tutor and most of all, the trainees in the unit. This can be very difficult to organize as often journal clubs lack orientation and structure. This is complicated by the fact that the more junior trainees and General Practice trainees may not be interested in an exam-focused critical appraisal at all. If it is difficult to arrange at a hospital site level, it would be best to arrange this among the candidates themselves during group study time.

Eight to 10 weeks towards the exam, the candidate is expected to have read a core textbook in psychiatry – cover to cover – for example the *Oxford Shorter Textbook of Psychiatry* or the *Companion to Psychiatric Studies*. During the final 8–10 weeks preceding the exam, it would be best to create a timetable with the syllabus and curriculum in mind so as not to leave out important topics. Reading during this period should be exam oriented and should be done along with practice MCQs. This could be done on your own or in a study group. Preparing in a group helps to get an idea of where one stands with respect to the knowledge base.

Practice tests

A number of revision courses are now available for the new MRCPsych exams. Revision courses and materials should be used only to aid rapid revision and synthesize exam techniques. It is best to revise from material the candidate has already read once through the previous 10 months, rather than starting afresh. The MRCPsych exam prepares a psychiatric trainee for lifelong learning. It is best not to rely exclusively on 1 or 2 days of cramming to gain knowledge that sets your career on track.

It is best to take a number of mock and practice tests before the exam, as these will give a fairly good idea of strengths and weaknesses. Look out for mock exams conducted by industry sponsors and local tutors. If possible, request your senior colleagues to organize a mock exam. It is best to do mock exams in the original exam conditions, i.e. in paper and pencil format, with 200 questions and a time of 180 minutes.

Books to read

Knowledge is not derived from textbooks alone. All kinds of resources are useful, including the internet, but it is best to base the core reading on standard textbooks. These textbooks should form the basis of reading, but reading should not be restricted to these.

The two reference books that we recommend are *Kaplan and Sadock's Comprehensive Textbook of Psychiatry* (this is an American book, which is comprehensive, with DSM and ICD criteria, and forms excellent reading in all aspects of psychiatry, including specialty topics) and the *New Oxford Textbook of Psychiatry* (the latest edition is now published). Both are two-volume textbooks and are useful for all parts of the exams.

For 'core' text reading, the *Shorter Oxford Textbook of Psychiatry* is a very good book. Each chapter is written in an authoritative style and relevant to training in the UK. At the end of each section or topic there is a reference for further reading in the topic, which is invaluable. Most psychiatric specialty topics are covered extensively in the above-mentioned textbooks. A relatively new book that has been published recently and highly recommended by the authors is the *Essential Psychiatry* textbook edited by Robin Murray, et al. This book is very much UK oriented, but with a fantastic array of authors from both sides of the pond, the book gives a concise and truly international view of psychiatry. A special recommendation by the authors is *Sadock's Synopsis of Psychiatry*. This remains one of the most comprehensive 'short' textbooks of psychiatry. Any one of these 'core' books should ideally be read, cover to cover, at least once over the period of training.

The Oxford specialist handbooks in psychiatry are currently available for child psychiatry, addictions, and old age psychiatry. The books are a concise overview of the relevant clinical topics. The seminar series brought out by the college are authoritative in each specialty. Since these books are brought out by the Royal College, it seems logical to think that a number of questions may be based on these books. It should be kept in mind that some of these books are outdated.

The *Handbook of Liaison Psychiatry* edited by Lloyd and Guthrie is recommended as a reference text for liaison psychiatry. *Lishman's Organic Psychiatry* has been recently updated and forms a good reference source for neuropsychiatry. The authors recommend *Neuropsychiatry and Behavioural Neuroscience* by Jeffrey Cummings as a concise and to the point book for neuropsychiatry. *The Oxford Textbook of Old age Psychiatry* edited by Jacoby, et al. is a standard reference textbook for old age psychiatry.

As far as child psychiatry is concerned, *Goodman and Scott's – Child Psychiatry* is the standard recommended read at the basic training level. Sir Michael Rutter's textbook *Child and Adolescent Psychiatry* remains a classic reference textbook. We also recommend Lewis's *Child and Adolescent Psychiatry: A Comprehensive Textbook* edited by Martin and Volkmar. It is an American book, but is an excellent and comprehensive read. Topics on substance use are very well covered in Kaplan and Sadock's *Synopsis of Psychiatry*. There is a separate chapter dedicated for each substance and psychopathology associated with their use.

Most core psychotherapy topics can be read from any standard textbook of general psychiatry. Both the two-volume reference books mentioned earlier have extensive chapters on psychotherapy. Two other books are the *Oxford textbook of Psychotherapy* and *Gabbard's Textbook of Psychotherapeutic Treatments*. The college seminar series is concise and Freeman and Power's *Handbook of Evidence-based Psychotherapies* gives a good critical appraisal of most psychotherapeutic research.

The Royal College's own *Advances in Psychiatric Treatment* is a good source for review articles, in most cases written by experts in the field. Nevertheless, it should be noted these are mostly narrative rather than systematic reviews.

The *Evidence-based Mental Health Journal* is an excellent source for articles on critical appraisal. The *Canadian Journal of Psychiatry* (not very popular in Britain, but available free of charge online) is an excellent source for up-to-date review articles and also for articles on critical appraisal and statistical concepts. The author of the statistics topics in the journal – David Streiner – is an excellent writer, who makes these often complex topics highly accessible to we clinicians, most of us suffering from 'photounumerophobia' (a fear that our fear of numbers would come to light – a concept devised by Streiner).

MRCPsych exam Paper 3 revision techniques in summary

1. Always stick to the standard textbooks you have read earlier. But remember textbooks are not written with the aim of helping trainees pass MRCPsych exams. So avoid spending too much time on irrelevant details. Nevertheless, you should have read a 'core' textbook, cover to cover, at least 8 weeks before the exam.
2. As the question banks evolve, the candidate should be able to revise and attempt the exam confidently; one should get the basic concepts straight and correct, in order to tackle any surprises!
3. Group study helps in many ways; but make sure your peers are motivated to fully participate in the groups (especially for critical appraisal discussions).
4. Plan, plan, and plan! Structure your time according to the syllabus you have to revise. Spend equal time updating your knowledge from journals and solving MCQs.
5. There is no harm in utilizing all available materials before you attempt your exam – ask your senior ST trainees or colleagues and seek resources from revision courses and local MRCPsych teaching lectures.
6. A word of caution, most senior psychiatrists have a vast amount of clinical wisdom. Clinical wisdom is gained over a period of time, having spent a number of years working in the specialty and may be extremely helpful in the day-to-day practice of psychiatry. While this can be useful in topics like psychotherapy and the likes, it is best to stick to standard reference textbooks as sources of information for a theory exam like the MRCPsych, which bases a lot of its questions on recent advances and evidence-based sources.

APPROACH TO MULTIPLE CHOICE QUESTIONS^{3,4}

The MRCPsych exam is more than reading and understanding the core subject, it is also to do with the technique of attempting the best of five MCQs. Unlike the old-style ISQ, the new style is a bit more difficult to do because the chance of getting the answer wrong is 80% compared to 50% with the older style. The very concept of selecting the best answer lies in the fact that there may be more than one right answer, but we need to choose the best answer. In order to do this you get 180 minutes to answer 200 questions, that is less than 1 minute to answer a question. This means that the more familiar you are with the concepts, the faster you can answer and you will be able to spend more time on the more difficult and longer questions. It is said that in most medical examinations, candidates who answer half the questions correctly would score around the 50th or 60th percentile. A score of 65% (130/200) would place the examinee above the 80th percentile, whereas a score of 30% (60/200) would rank him or her below the 15th percentile. Test performance will always be

influenced by your test-taking skills. Considering various test-taking strategies, developing and perfecting them well in advance of the test date can help you concentrate better on the test itself. We recommend you try various techniques to find what works best for you. It should, in the end, help you to:

- increase your reading pace;
- focus on the most relevant information;
- eliminate as many options when you are not sure of the correct answer.

You require enough practice using the techniques so that it becomes second nature and you don't concentrate on anything but how to choose the correct answer when you actually sit the exam.

Timing

Time management is an important skill for exam success. As mentioned above, the test has 200 questions to be answered in 3 hours. This leaves less than a minute for each question. Each time you spend more than a minute on a single question, time should be made up on other questions. Therefore it is essential to practise answering questions within a time limit to avoid pacing errors in the exam. This is where attempting a number of mock exams will help.

Approaching each question

There are several established techniques for tackling MCQs which will help you in finding the single best answer choice. One of these is classifying each question as easy, workable, or impossible. The basic aim in doing this is to

- answer all easy questions;
- figure out the answer to all the workable questions in a reasonable amount of time;
- make fast and intelligent guesses on the impossible ones.

Another technique is to read the answer choices first along with the last sentence of the question before reading through the question quickly, so as to extract the most relevant information as well as to consider each of the answer possibilities in the context of the question. This is especially relevant when the question stem is large, for example a case scenario.

Elimination is one of the best tools that can be used in a single best answer multiple choice exam.

Excluding the possibility of one answer choice proportionately increases the probability of you choosing the right answer.

Since this is a paper and pencil exam, it is better to answer the questions in order, one by one; this reduces chances of skipping and accidentally marking the wrong question or skipping an item. To avoid these 'frame-shift' errors, answer difficult questions with your best guess, mark them for review, move on and come back to them if you have time at the end.

Random guessing

- There are no negative marks for wrong answers, so no question should be left unanswered.
- A hunch is probably better than a random guess; we also suggest selecting a choice which you recognise over another which is totally unfamiliar to you.
- It is never beneficial to pick random choices unless you are grossly out of time and not answering all the questions, in which case the best bet would be to select a single letter like 'C' and marking the remaining questions with it. It is obvious that in this case the chance of picking the correct answer decreases with more answer choices. It is also believed that MCQ makers prefer to hide the answers either in C or D, the middle-most choices, more often than in the periphery (however, it should be noted that the college is trying to get rid of this bias by presenting the multiple choices in alphabetical order).
- It is also very important to not randomly guess the answers during your study and review sessions as well as the practice test sessions, as it may increase the tendency to do the same for the exam.

- As mentioned before, it is essential to take as many practice tests as possible to try the various techniques and select the ones that give you the best results.
- Use any extra time you might have to recheck your answers. Do not be casual in your review or you may overlook serious mistakes.
- Never give up. If you begin to feel frustrated try taking a 30-second breather. Remember your goals and keep in mind the effort and time you have spent in preparing for the exam compared with the small additional effort you will need to keep your focus and concentration throughout the exam.

Other things to do before the exam

Make arrangements for study leaves as early as possible. It is also important to find out how much private study leave you are entitled to. Make all the necessary swaps on the on call rota. Some deaneries arrange for stay and transport for the exam if there are a number of candidates taking the exam. Application forms should be sent well in time. If there are queries regarding applications, they should be clarified from the college at the earliest.

The day prior to exam, choose a good place to stay near the centre, even if it is expensive. As usual, it is important to get a good night's sleep. A good preparation should make you feel confident.

BOF MCQ exam techniques in summary

1. People who fail in MCQ exams do so not because they don't know the answer for some questions; it is because they think they know the answer and keep thinking about one question for 5 minutes or so, losing the remaining time to answer the rest.
2. All questions carry one mark only, no matter how easy or difficult each one is. So why spend all your time on 'difficult ones'?
3. In large, clinical vignette type of questions you may have many irrelevant details; at the same time you may also have valuable clues to solve the BOF. It is useful to read the last sentence of the question, quickly before reading the large vignettes fully.
4. People have different styles of approaching BOF. Exclusion technique needs more time than direct answer picking; if your style is one of exclusion, make sure you practise well enough to carry this out faster during the exam.

AFTER THE EXAM

If you have some stamina left at the end of this huge ordeal, it is not a bad idea to start recollecting the questions to form a question bank which will be useful for future candidates. It is best to recollect the questions in the company of a couple of colleagues. It will be a good idea to get the questions back to the college tutor and this will help to arrange further teaching. This will also help you to prepare for paper 3 in future.

READING LIST

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Neuropsychiatry and Liaison psychiatry

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Cummings JL and Mega MS, eds. *Neuropsychiatry and Behavioural Neuroscience*. Oxford University Press, 2003.

Research methodology and critical appraisal

Lawrie S, McIntosh A, and Rao S. *Critical Appraisal for Psychiatrists* (MRCPsy Study Guides) (Paperback 2000). This is a good book, slightly more detailed, with MCQs for exercise.

Norman GR and Streiner DL. *Biostatistics: the Bare Essentials*, 3rd edn. BC Decker, 2007. This is good book on statistics, written for doctors with knowledge of mathematics at no greater than high school level.

Greenhalgh T. *How to Read a Paper: The Basics of Evidence-based Medicine*, 3rd edn. Blackwell, 2006. *Evidence-Based Mental Health Journal* (available through Athens accounts) and Review articles in the *Canadian Journal of Psychiatry* are highly recommended.

www.passappraisal.com is a good resource maintained by the authors.

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Freeman C and Power M. *Handbook of Evidence-based Psychotherapies: A Guide for Research and Practice*, 1st edn. WileyBlackwell, 2007.

¹ <http://rcpsych.ac.uk/PDF/Exams%20Eligibility%20July%202008.pdf>

² <http://rcpsych.ac.uk/exams/about/mrcpsychpaperiii.aspx>

³ Bhushan V, Le T. *First Aid for the USMLE Step 1* (First Aid) (Paperback) McGraw Hill Higher Education; 16Rev Ed edition (1 Jan 2006)

⁴ Princeton Review, Stein M, Hwang G. *Cracking the Boards: USMLE Step 1*, 3rd Edition (Princeton Review Series) (Paperback) Princeton Review; 3 edition (Dec 2000)

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- 1. According to ICD-10 criteria which of the following is considered to be the minimum required weight loss to be significant as a diagnostic criteria for somatic syndrome associated with depression?**
 - A. Loss of 1% body weight in 1 month
 - B. Loss of 5% body weight in 3 months
 - C. Loss of 2% body weight in 2 weeks
 - D. Loss of 5% body weight in 1 month
 - E. Loss of 15% body weight in 1 week
- 2. The prevalence of catatonic phenomenon among patients with schizophrenia is estimated to be around**
 - A. 1–2%
 - B. 0.01–0.05%
 - C. 5–10%
 - D. 15–25%
 - E. 30–35%
- 3. Seasonal affective disorder (SAD) is a popular concept but not formally considered as a separate category under current classificatory systems. Which of the following statements is true with regard to this condition?**
 - A. Seasonal depression carries higher familial risk of affective disorders than non-seasonal depression
 - B. In phototherapy for SAD, exposure to skin is more effective than exposure to eye
 - C. Early-morning light therapy is more effective than evening exposure
 - D. Side-effects of exposure are more intense with evening than morning therapy
 - E. Conventional antidepressants have no effect on seasonal depression
- 4. The 1-year prevalence of dysthymia is estimated to be around**
 - A. 15–20%
 - B. 20–25%
 - C. 1–6%
 - D. 0.1–0.6%
 - E. 10–15%

- 5. The most powerful predictors of recurrence of depressive episodes among the following is**
- A. Previous episodes of depression and presence of residual symptoms
 - B. Non-bipolar diagnosis and later age of onset
 - C. Female gender and earlier age of onset
 - D. Higher degree of life events and family history of affective disorders
 - E. Male gender and past history of psychiatric admission
- 6. The proportion of patients who develop a depressive episode and then go on to develop an episode of mania within 10 years is approximately**
- A. 1 in 2
 - B. 1 in 10
 - C. 1 in 4
 - D. 1 in 50
 - E. 1 in 200
- 7. Clinical depression and bereavement share many common features. Which of the following clinical features points to clinical depression rather than normal mourning?**
- A. Brief hallucinations
 - B. Somatic symptoms
 - C. Anxiety when reminded of loss
 - D. Psychomotor retardation
 - E. Angry pining
- 8. Which of the following is an early sign of prolonged grief?**
- A. Self-blame regarding the death
 - B. Shock and disbelief
 - C. Clinging behaviour
 - D. Anxiety when reminded of loss
 - E. Brief hallucinations
- 9. The term 'specifier' is used when describing psychiatric diagnoses. Which of the following is correct with regard to this term?**
- A. It is used in ICD-10 only
 - B. It is used in DSM-IV only
 - C. It refers to treatment response
 - D. It is used in both DSM IV and ICD 10
 - E. It refers to number of previous episodes

10. Which of the following is true with regard to the longitudinal course of bipolar disorder?

- A. The duration of mood episodes decreases progressively
- B. Initial episodes have more rapid onset than later episodes
- C. The interval between episodes decreases progressively
- D. Seasonal pattern is more common in bipolar type 1 than type 2
- E. Later episodes are more likely to be triggered by life events than the initial episodes

11. The most common psychiatric disturbance associated with Cushing's disease is

- A. Depression
- B. Mania
- C. Mixed affective state
- D. Schizophreniform psychosis
- E. Dementia

12. Polyuria can be a troublesome side-effect with lithium therapy. Which of the following is NOT correct with respect to lithium-related polyuria?

- A. It is seen in one-third of those treated with lithium
- B. It is usually reversible
- C. Once-daily dose produces more polyuria than multiple doses a day
- D. Amiloride is a useful intervention
- E. Dose reduction may alleviate polyuria

13. Which of the following electrolyte disturbances simulate lithium-induced changes in electrocardiogram?

- A. Hyperkalaemia
- B. Hypocalcaemia
- C. Hypomagnesaemia
- D. Hypokalaemia
- E. Hyponatraemia

14. Lithium is associated with thyroid dysfunction in some cases. Which of the following is false with respect to this association?

- A. 5–10% of patients on lithium develop clinical hypothyroidism
- B. Thyroid enlargement is the most common clinical presentation
- C. Presence of thyroid antibodies increases the risk
- D. Family history of thyroid disease increases the risk
- E. Increased TSH is the most sensitive laboratory index

- 15. Compared with the general population, the risk of Ebstein's anomaly in children of mothers exposed to lithium during the first trimester of pregnancy is**
- A. 2–3 times higher
 - B. 10–20 times higher
 - C. 50–80 times higher
 - D. 100–120 times higher
 - E. 4–5 times higher
- 16. A 48-year-old man is prescribed sodium valproate for prophylaxis against bipolar mania. He develops a confusional state despite liver function tests being within the normal range. Which of the following conditions related to valproate use is most likely to be associated with the above presentation?**
- A. Hyperammonaemia
 - B. Hepatic failure
 - C. Pancreatitis
 - D. Hypertensive encephalopathy
 - E. Ketoacidosis
- 17. All of the following patients are under carbamazepine therapy for bipolar disorder. In which of the following patients will you discontinue the carbamazepine treatment immediately?**
- A. A 34-year-old man developing dizziness
 - B. A 50-year-old man with blood carbamazepine levels 9 mg/L
 - C. A 44-year-old woman with neutrophil count less than 1000 per mm³
 - D. A 37-year-old man with sodium levels 129 mEq/dL
 - E. A 48-year-old woman with elevation of thyroid-stimulating hormone (TSH) levels
- 18. Which of the following predicts a good prophylactic effect of lithium in bipolar disorder?**
- A. Absence of family history of bipolar disorder
 - B. Presence of neurological signs
 - C. 'Depression–mania–well interval' pattern of bipolar course
 - D. Good antimanic efficacy during acute episode
 - E. Absence of complete inter-episode recovery
- 19. Which of the following situations associated with parental loss carries the highest risk of developing depression as an adult?**
- A. Children born to single mothers
 - B. Children of divorced mothers
 - C. Children of remarried mothers with conflicts after remarriage
 - D. Childhood bereavement with loss of one parent
 - E. Children living with divorced parent after conflictual relationship

20. Adverse life events are consistently associated with depression. Which of the following statements with respect to the above relationship is NOT true?

- A. 30% of those with depression have no history of preceding significant life events
- B. Suicide attempters have a higher amount of life events than depressed patients
- C. Loss or humiliation events are highly correlated with depression
- D. The impact of life events depends on the contextual threat posed by them
- E. No reverse causality exists between depression and life events

21. All of the following are characteristic features of a depression-prone individual except

- A. Perceiving higher probability for aversive outcomes
- B. Believing that aversive events are uncontrollable
- C. Attributing negative events to external, unstable but specific causes
- D. Fragile self-esteem
- E. harbouring high amount of information processing biases

22. Anti-obesity drug rimonabant is associated with significant psychiatric adverse effects. Which of the following correctly describes the mechanism of action of rimonabant?

- A. Cannabinoid CB₁-receptor antagonist
- B. Cannabinoid CB₂-receptor antagonist
- C. Monoclonal antibody against GABA_A subunits
- D. NMDA receptor antagonist
- E. Cholecystokinin antagonist

23. Which of the following neurotransmitters is proposed to be involved in increasing the significance (salience) of external stimuli in patients with schizophrenia?

- A. GABA
- B. Glutamate
- C. Endocannabinoids
- D. Dopamine
- E. Noradrenaline

24. All of the following are diagnostic features of neuroleptic malignant syndrome (NMS) except

- A. Diaphoresis
- B. Fluctuant blood pressure
- C. Myoclonus
- D. Tachycardia
- E. Mutism

25. The most common phase of sleep when nocturnal panic attacks appear is

- A. Transition between stage 2 and stage 3
- B. Transition between stage 1 and stage 2
- C. REM sleep
- D. Transition between REM sleep and awake state
- E. Stage 1 sleep

26. All of the following are sleep changes associated with depression except

- A. Reduced REM latency
- B. Reduced REM density
- C. Increased duration of first REM period
- D. Low arousal threshold
- E. Reduced stage 3 and 4 sleep

27. A 60-year-old man has episodes of disturbed sleep. He experiences unusual movements associated with singing and talking to unseen people during some of these episodes. He recalls vivid dreams when he wakes up. The most appropriate diagnosis would be

- A. Sleep-walking
- B. Sleep terrors
- C. REM sleep behavioural disorder
- D. Periodic limb movement disorder
- E. Restless legs syndrome

28. All of the following are recognized treatment options for restless legs syndrome except

- A. Levodopa
- B. Pergolide
- C. Pramipexole
- D. Amitriptyline
- E. Clonazepam

29. A 29-year-old man presents with erectile dysfunction. His history reveals excessive stress at work. Which of the following indicates a psychogenic rather than an organic cause for his sexual dysfunction?

- A. Sudden onset of the erectile problem
- B. Erectile dysfunction occurs in all settings
- C. Loss of early-morning erections
- D. Preserved ejaculation despite impaired erection
- E. Complete lack of tumescence

30. Which of the following drugs used for erectile dysfunction acts via the dopaminergic mechanism?

- A. Sildenafil
- B. Vardenafil
- C. Alprostadil
- D. Apomorphine
- E. Yohimbine

31. Which of the following instruments is validated for predictive screening for chronic post-traumatic stress disorder (PTSD) in those who are exposed to traumatic events?

- A. Holmes and Rahe Social Adjustment scale
- B. Life Events and Difficulties Scale
- C. Trauma Screening Questionnaire
- D. Appraisal of Life Events Scale
- E. Abbreviated Injury Scale

32. Reduced flush response to nicotinic acid (niacin) skin patches has been demonstrated in

- A. Depression
- B. Bipolar disorder
- C. Schizophrenia
- D. Autism
- E. Anorexia nervosa



33. Oral administration of a tryptophan-free amino acid mixture can lead to tryptophan depletion. This can trigger relapse of depression in patients being treated for depression. The above phenomenon is most likely seen in those on

- A. Selective serotonin reuptake inhibitors (SSRIs)
- B. Tricyclic antidepressants
- C. Reboxetine
- D. Cognitive behavioural therapy
- E. Maintenance electroconvulsive therapy



34. All of the following receptor changes are correctly paired except

- A. Increased cortical 5HT_{2A}: depressed patients
- B. Increased cortical 5 HT_{1A}: depressed patients
- C. Increased cortical 5HT_{2A}: ECT treatment
- D. Increased cortical 5HT_{2A}: suicide victims
- E. Decreased β receptors: antidepressant therapy



35. Which of the following is true with regard to lithium toxicity?

- A. Severity is highly correlated with serum levels
- B. Neurotoxicity occurs only above therapeutic serum levels
- C. Fine tremor is a sign of toxicity
- D. Lithium levels often rise even after cessation of treatment
- E. Most patients are left with some residual neurological damage

36. Which of the following antidepressants demonstrate the highest affinity for muscarinic acetylcholine receptors of the human brain?

- A. Amitriptyline
- B. Clomipramine
- C. Amoxapine
- D. Trazodone
- E. Desipramine

37. The number of patients who die from hypertensive crises (including fatal 'cheese reaction') when monoamine oxidase inhibitors such as tranylcypromine are prescribed is approximately

- A. 1 in 1000 patients
- B. 1 in 100 patients
- C. 1 in 10 000 patients
- D. 1 in 100 000 patients
- E. 1 in 10 patients

38. Which of the following antidepressants has been found to be as lethal as tricyclic antidepressants (TCAs) in cases of overdose?

- A. Citalopram
- B. Mirtazapine
- C. Venlafaxine
- D. Moclobemide
- E. Escitalopram

39. The lorazepam challenge test is used in the diagnosis of

- A. Dissociative amnesia
- B. Transient global amnesia
- C. Catatonia
- D. Panic disorder
- E. Endogenous depression

40. Which of the following laboratory abnormalities is associated with malignant catatonia?

- A. High serum magnesium
- B. Low serum iron
- C. Low liver enzymes
- D. High serum amylase
- E. Low creatinine phosphokinase

41. All of the following indicate a better treatment response to ECT except

- A. Shorter illness duration
- B. Past response to antidepressant treatment
- C. Significant post-ictal suppression on EEG
- D. High ictal amplitude on EEG
- E. Past history of mania

42. While treating social anxiety disorder with SSRIs, an adequate treatment trial should probably extend to

- A. 4 weeks
- B. 6 weeks
- C. 12 weeks
- D. 24 weeks
- E. 18 months

43. A 32-year-old woman presents with concerns regarding her 'ugly appearance'. She had been convinced for a long time that her appearance was defective and was particularly worried about her 'streak' eyes. She admitted spending at least 14–16 hours a day thinking about her appearance and comparing herself with other people or seeking reassurance from others. Which of the following is true with regard to the treatment of this condition?

- A. She may respond to higher than usual antidepressant doses of serotonin re-uptake inhibitors (SSRIs)
- B. There is a good evidence for response to ECT in this condition
- C. She has a comparable likelihood of response to SSRIs and non-SSRIID antidepressants
- D. She will require a shorter than usual duration of treatment trial with SSRIs
- E. Cognitive behavioural therapy (CBT) has no role in the treatment

44. A 17-year-old girl is admitted to a medical unit following a prolonged period of repeated bingeing and vomiting. She induces vomiting at least six times a day but does not use laxatives or diuretics. Which of the following laboratory finding is most likely in this patient?

- A. Low urea levels
- B. High potassium levels
- C. Low bicarbonate levels
- D. Increased thyroxine levels
- E. High amylase levels

- 45. A 54-year-old African-Caribbean man had systematized persecutory delusions that prevented him from eating for 5 weeks. Following admission to a medical unit he was started on realimentation, despite which he developed diplopia, bilateral horizontal nystagmus and right sixth cranial nerve palsy. He had no past history of alcohol use. On transfer to a psychiatric ward, he was started on a normal diet but soon his phosphate levels were markedly reduced (0.26 mmol/L). The most likely diagnosis is**
- A. Normal pressure hydrocephalus
 - B. Olanzapine overdose
 - C. Refeeding syndrome
 - D. Laxative abuse
 - E. Hepatic failure
- 46. A 17-year-old girl presents with sudden-onset blindness while preparing for her school exit examinations. Which of the following suggests an ocular rather than a psychogenic cause for blindness?**
- A. Normal visual evoked potentials
 - B. Presence of tubular vision
 - C. Spiral changes in visual fields
 - D. Absence of optokinetic nystagmus
 - E. Disturbances in tests for proprioception
- 47. Which of the following culture-bound syndromes is closely associated with social phobia?**
- A. Brain fag syndrome in West Africa
 - B. Dhat syndrome in South Asia
 - C. Frigophobia in China
 - D. Taijin kyofusho in Japan
 - E. Arctic hysteria in Greenland
- 48. Which of the following mechanisms is proposed to underlie hypersalivation seen in patients taking clozapine?**
- A. Muscarinic M₁ blockade
 - B. Muscarinic M₄ stimulation
 - C. Histaminic H₁ blockade
 - E. Serotonergic 5HT_{2C} blockade
 - F. Noradrenergic α₁ blockade
- 49. Which of the following can increase levels of clozapine via alterations in hepatic metabolism?**
- A. Rifampicin
 - B. Phenytoin
 - C. Carbamazepine
 - D. Cigarette smoking
 - E. Erythromycin

50. All of the following neuroendocrine changes are noted in depression EXCEPT

- A. Raised salivary cortisol measures
- B. Abnormal dexamethasone suppression test
- C. Reduced Corticotropin-releasing hormone (CRH) in cerebrospinal fluid
- D. Downregulated CRH receptors
- E. Reduced adrenocorticotropic hormone (ACTH) response to CRH infusion

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1.D. Somatic syndrome is defined by a set of vegetative or biological features of depression. The ICD-10 criteria for somatic syndrome of depression require at least four symptoms from a list of eight. These are (1) marked loss of interest or pleasure; (2) loss of emotional reactions; (3) early-morning awakening (2 hours before normal waking time); (4) diurnal worsening of mood; (5) objective evidence of marked psychomotor retardation or agitation; (6) marked loss of appetite; (7) loss of libido and (8) 5% or more of body weight lost unintentionally in the past month. To diagnose anorexia nervosa, there must be a weight loss leading to a body weight at least 15% below the normal expected weight for age and height.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 11.

2.C. According to the International Pilot Study of Schizophrenia (World Health Organization 1973), 7% of 811 schizophrenia patients exhibited one or other catatonic phenomenon. Further studies that followed gave a figure of between 5% and 10%. Mannerisms are the most common catatonic phenomenon in schizophrenia, followed by stereotypies, stupor, negativism, automatism and echopraxia in order of frequency. About 10–15% of patients with catatonia meet the criteria for schizophrenia. It is widely appreciated that catatonic symptoms are more prevalent in the developing nations than in the West. When one includes all psychiatric patients, not just schizophrenia, the prevalence of catatonia increases to 10–20%. This is because depression contributes to most of the observed catatonia in practice. Immobility and mutism are the most commonly observed catatonic symptoms among depressed patients.

Hirsch SR and Weinberger DR, eds. *Schizophrenia*, 2nd edn. Blackwell Science, 2007, p. 19.

Taylor MA and Fink M. Catatonia in psychiatric classification: a home of its own. *American Journal of Psychiatry* 2003; **160**: 1233–1241.

3.C. ICD-10 clinical guidelines do not include specific criteria for SAD. However, specific criteria are included in DSM-IV (Text Revision) and the research version of ICD-10. ICD-10 provisional criteria for SAD specifies the disorder as a subtype of mood disorder where three or more episodes must occur with onset within the same 90-day period of the year for three or more consecutive years; Remissions also occur within a particular 90-day period of the year. Seasonal episodes must outnumber any non-seasonal episodes that may occur. Familial risks of affective disorders in SAD are similar to those found in non-seasonal depressive illnesses. Typical depressive symptoms of SAD respond better to bright-light therapy whereas atypical symptoms respond to phototherapy at all intensities. In phototherapy retinal light exposure is important; skin absorption is not sufficient to modify circadian rhythms or depressive symptoms. Early-morning phototherapy is superior but leads to more side-effects, such as easy startle, gastrointestinal intolerance and headaches. Conventional antidepressants have also been reported to have a therapeutic effect in SAD.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 13.

Rodin I and Thompson C. Seasonal affective disorder. *Advances in Psychiatric Treatment*, 1997; **3**: 352–359.

4.C. Dysthymia has a 1-year prevalence of 1–3%. The lifetime prevalence according to the National Comorbidity Survey 1994 is 6%. Dysthymia has a high comorbidity with other psychiatric disorders, particularly major depression. In one series, only about 25–30% of cases were observed to occur over a lifetime in the absence of other psychiatric disorders. The comorbidity of personality disorders seems to be very high (60–80%). Early-onset dysthymia is defined as having onset before age 21.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 14.

5.A. Follow-up studies in depression reveal two powerful predictors of recurrence: the presence of residual symptoms after apparent recovery and history of previous episodes of depression. The presence of residual symptoms increases the risk of recurrence nearly threefold, whereas past history of depression doubles the risk, with each new episode increasing the risk further. Other possible risk predictors for recurrence include somatic syndrome, reversed vegetative signs, early age of onset, and family history of mood disorders. Recurrence risk is higher in bipolar than in unipolar mood disorders.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 17.

6.B. In community studies, 1 in 10 patients who begin with a depressive episode go on to develop an episode of mania within 10 years. If the illness begins at a younger age, the switch happens earlier. This rate increases to nearly 50% if severely depressed hospitalized patients are considered. Long-term follow-up studies blinded for severity and number of previous episodes show much lower conversion rates (3.2%). It is known that the majority of bipolar patients, particularly women, begin with depressive episodes. Among hospitalized depressed patients followed up for nearly a decade, 1% a year converted to bipolar I and 0.5% a year converted to bipolar II. However, this conversion rate is less for outpatients with depression. Factors associated with a change of polarity from unipolar to bipolar were younger age, male sex, family history of bipolarity, antidepressant-induced hypomania, hypersomnic and retarded phenomenology, psychotic depression, and a postpartum episode. The mean age at which the switch occurs is 32 years. The average number of previous episodes in those who switch varies between two and four. The huge differences in switch rates probably reflect the severity of the initial depression, the length of follow-up, and the expanding definitions of bipolar II disorder.

Angst J, et al. Diagnostic conversion from depression to bipolar disorders: results of a long-term prospective study of hospital admissions. *Journal of Affective Disorders* 2005; **84**: 149–157.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 18.

7.D. Parkes described features that may distinguish normal mourning from depression. Normal mourning is characterized by pangs of grief, angry pining, and anxiety when reminded of the loss, brief hallucinations, somatic symptoms, and identification-related behaviours. The presence of psychomotor retardation, generalized guilt and suicidal thoughts after the first month suggest development of depression.

Parkes CM and Prigerson H. *Bereavement: Studies of Grief in Adult Life*, 3rd edn. Penguin, 1998.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 19.

8.C. Clinging behaviour and inordinate pining may be early signs of prolonged grief as described by Parkes. More recently, childhood experiences of early parental death or divorce, sudden or violent death of a loved one, and high levels of dependency on the deceased for a sense of personal well-being are thought to be associated with prolonged grief. Several of these factors suggest the role of attachment insecurity in increasing a person's vulnerability to complicated bereavement.

Lichtenthal WG, Cruess DG and Prigerson HG. A case for establishing complicated grief as a distinct mental disorder in DSM-V. *Clinical Psychology Review*, 2004; **24**: 637–662.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 20.

9.B. Specifiers are extensions to a diagnosis that further clarify the course, severity, or special features of the diagnosis. Note that while subtypes are mutually exclusive and jointly exhaustive patterns of diagnostic description, specifiers merely provide an opportunity to define a more homogeneous subgrouping based on observable clinical phenomenon. DSM-IV uses specifiers extensively while dealing with mood disorders. These include specifiers of the most recent episode and the longitudinal course. Specifiers of current clinical severity, psychotic features, and remission status are the most commonly used. Other descriptive specifiers include catatonic features, melancholic features, atypical features, and postpartum onset. The longitudinal course specifiers include a seasonal pattern and the presence of rapid cycling. ICD-10 does not use the term 'specifiers' separately, although the majority are discussed in the core text.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 26.

10.C. In any patient with bipolar disorder, the duration of individual mood episodes tends to be relatively stable throughout the course, with mania generally lasting for a shorter time than depression. But the onset may become more rapid with age. The interval from one episode to the next tends to decrease through the course of illness, although some evidence suggests a tendency for the inter-episode intervals to stabilize after approximately five episodes. Patients with seasonal patterns are more commonly of bipolar II subtype than bipolar I. The first episode is more likely to be triggered by life events than later episodes. Ambelas confirmed the strong correlation between stressful life events and first manic admissions; this association weakens as the illness progresses. This is particularly true for younger bipolar patients with mania rather than depression. This is consistent with the hypothesis of kindling phenomenon in bipolar disorders.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 27–29.

Ambelas A. Life events and mania: a special relationship? *British Journal of Psychiatry* 1987; **150**: 235–240.

11.A. Cushing's syndrome is very frequently, although not invariably, associated with depression. Nearly 40% of cases in one series of observation had depression whereas only 3% had mania. It is claimed that the predominance of pure depressive disorders may be a result of publication bias; controlling for this yields mixed anxiety and depression as the most common psychiatric disturbance in Cushing's syndrome. Depression in Cushing's syndrome may occur as a prodrome even before the medical disorder is diagnosed; the phenomenology may differ from primary major depression in that the symptoms are intermittent when associated with Cushing's syndrome. Psychosis occurs more commonly in association with affective states; isolated schizophreniform psychosis is rare. Delirium may occur in 15–20% of patients.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 30.

12. C. Lithium-related polyuria and polydipsia are seen in nearly one-third of those treated. Polyuria is usually reversible in the early stages but may become obstinate the longer the therapy lasts. When a once-daily preparation of lithium is used instead of multiple divided doses, the frequency of polyuria seems to be less, but a direct correlation between plasma peaks and polyuria is not clearly demonstrated in clinical samples. Dose reduction or use of amiloride can be tried in those who have troublesome levels of polyuria. Amiloride has relatively less propensity to cause electrolyte disturbances when co-prescribed with lithium than with other diuretics.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 34.

13. D. Lithium exerts minimal cardiac effects at therapeutic doses in most patients. It most commonly produces benign reversible T-wave changes (including inversion and flattening) in the resting electrocardiogram (ECG). These hypokalaemia-like changes are seen in approximately 20–30% of patients treated with lithium. ECG abnormalities of clinical significance are mainly documented at toxic levels: they include all kinds of arrhythmias (sinus node dysfunction is well documented) and QTc prolongation. SA node dysfunction is the characteristic complication of lithium therapy and can manifest clinically as sinus bradycardia or atrioventricular conduction disturbances. Other parameters such as PR and QRS intervals often remain normal. Combining carbamazepine with lithium increases the risk for cardiac arrhythmias.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 35.
Mitchell JE and Mackenzie, TB. Cardiac effects of lithium therapy in man: a review. *J Clin Psychiatry* 1982; **43**: 47–51.

14. B. Nearly one-fifth of lithium-treated patients show increased plasma thyroid-stimulating hormone (TSH). About 5% show thyroid enlargement (goitre) whereas 5–10% have clinical hypothyroidism. Weight gain and lethargy are the most common clinical features. These effects are dependent on dose and the duration of lithium therapy. Middle-aged women with a pre-existing propensity for hypothyroidism in the form of autoantibodies against the thyroid are the most susceptible clinical group.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 35.

15. B. The risk of major congenital anomalies in children exposed to lithium in the uterus is 4–12%. This is nearly three times higher than non-exposed fetuses. The UK National Teratology Information Service has concluded that lithium increases the risk of cardiac malformations by approximately eightfold. First trimester exposure to lithium increases the risk of Ebstein's anomaly by nearly 10–20 times, bringing the absolute risk to 0.05–0.1%.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 36.
Williams K and Oke S. Lithium and pregnancy. *Psychiatric Bulletin* 2000; **24**: 229–231.

16.A. Valproate is associated with elevated plasma ammonia. In some people, hyperammonaemia may be clinically significant, resulting in hyperammonaemic encephalopathy characterized by varied clinical presentation, including irritability, agitation, drowsiness, asterixis, coma, and paradoxical seizures. Other symptoms may include loss of appetite, nausea, and vomiting. Valproic acid-induced hyperammonaemic encephalopathy may occur in people with normal liver function, despite normal doses and serum levels. It is more common in children with urea cycle enzyme deficiencies. Other risk factors include concomitant antiepileptic prescriptions (especially topiramate), underlying liver disease or hypoalbuminaemia, initiation of high-dose and long-term therapy. Propionate, a metabolite of valproate reduces the hepatic N-acetylglutamate concentration, which is an obligatory activator of carbamoyl phosphate synthetase 1 (CPS-1), the first enzyme of the urea cycle. Another potential mechanism may be via valproate-induced reduction in hepatic carnitine levels.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 38.
Barrueto F Jr and Hack JB. Hyperammonemia and coma without hepatic dysfunction induced by valproate therapy. *Academic Emergency Medicine* 2001; **8**: 999–1001.

17.C. Nausea, ataxia, and dizziness are common side-effects of carbamazepine; usually, none of these in isolation warrants a cessation of therapy. A maculopapular rash is noted in nearly 1 in 10 patients receiving carbamazepine. This usually occurs within 2 weeks of therapy and often requires cessation of treatment if associated with an abnormal blood count. Although leucopenia is seen in 1–2% of patients, serious agranulocytosis occurs rarely (about eight per million prescriptions). This bone marrow toxicity warrants a cessation of therapy and is indicated by a total white blood cell (WBC) count of less than 3000 per mm³ or a neutrophil count less than 1500 per mm³. Hyponatraemia is a common side-effect but levels up to 125 mEq/L can be managed conservatively without requiring sudden cessation of treatment. Elevation of thyroid-stimulating hormone does not necessitate stopping carbamazepine.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 39.

18.D. Various clinical, biological, and genetic factors that predict lithium responsiveness in prophylaxis of bipolar disorder have been studied. The presence of typical features of bipolar disorder, good inter-episode clinical recovery, a family history of bipolar disorder, experiencing mania as the first bipolar episode, and a good response to lithium in the acute manic phase predict lithium responsiveness. The presence of neurological signs, comorbid substance use, and the presence of rapid cycling predict a poor response to lithium. The lithium response in a sample composed of relatives of lithium responder probands was 67% compared with 30% in the control group; this indicates that lithium responsiveness may have a certain degree of heritability.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 40.
Grof P, Duffy A, Cavazzoni P, et al. Is response to prophylactic lithium a familial trait? *Journal of Clinical Psychiatry* 2002; **63**: 942–947.

19.C. Parental divorce between birth and age 7, regardless of subsequent remarriage, was predictive of a twofold higher depression risk. The relative risk of depression was highest for children whose single parent remarried into a conflictual relationship following divorce. It was shown that the quality of parental relationship, especially in relation to continuing conflict among those taking parental responsibilities, has a major effect on the subsequent risk of depression. Although childhood socioeconomic status was found to be a significant predictor of later depression, the risk for depression associated with parental divorce was found to be of a similar magnitude across categories of childhood socioeconomic status. There is little evidence that childhood bereavement itself predisposes to adult depression.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 54.

Gilman SE, et al. Family disruption in childhood and risk of adult depression. *American Journal of Psychiatry* 2003; **160**: 939–946.

20.E. Only 30% of those with depression give no history of significant life events. Depression itself may generate negative life events (reverse causality). Similarly, there may be a genetic contribution to the experience of adverse life events, making the gene–environment interaction more complex. The Life Events and Difficulties Scale is considered to be the standard life events assessment instrument. This scale is based on contextual measurement of the threat posed by life events (i.e. an event can be considered as significant only in accordance with social and cultural backgrounds and the life situation in which it occurs). It is shown that suicide attempts have a higher rate of life events than those with depression. Loss, humiliation, or separation events highly correlate with depression.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 55.

21.C. If negative events are ascribed to external, unstable, and specific causes, one may come to believe that they are modifiable; this will also induce less self-blame and guilt and will not induce feelings of helplessness or hopelessness. In contrast, individuals whose locus of control for negative events is internal, global, and non-specific show a higher degree of self-blame and depression-prone attitude. These individuals possess a high degree of information-processing biases characterized by the perception of a higher than possible probability for aversive events and belief that such events are uncontrollable (fatalistic). They also have a fragile self-esteem.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 58.

22.A. Rimonabant was approved in Europe as an anti-obesity agent in 2006. Rimonabant is a selective antagonist of the cannabinoid type 1 receptor, and it is the first member of a new class of compounds that targets the endocannabinoid system. But concerns have been raised regarding the psychiatric adverse effects of this drug. A meta-analysis by the American Food and Drug Administration showed that 26% of people given rimonabant 20 mg versus 14% of those given placebo had a psychiatric symptom reported as an adverse event. The side-effects range from depressed mood to anxiety and often led to co-prescription of a psychotropic or withdrawal of the drug. The relative risk for psychiatric adverse events in the rimonabant group was twice higher than the placebo group.

Christensen R, et al. Efficacy and safety of the weight-loss drug rimonabant: a meta-analysis of randomised trials. *Lancet* 2007; **370**: 1706–1713.

23.D. Kapur proposed that in the normal individual, the role of mesolimbic dopamine is to attach significance or 'salience' to an external stimulus or an internal thought. This converts a neutral piece of information into attention-grabbing information. In acute psychosis where a hyperdopaminergic state is noted in the mesolimbic system, insignificant events and perceptions receive inappropriate salience. For example, an innocuous smile of a stranger may be given a high degree of 'aberrant salience' leading to delusional elaborations. On a similar note, when such aberrant salience is attached to internally generated self-speech, hallucinations may be experienced. Antipsychotics are claimed to 'dampen the salience' of these abnormal experiences rather than erase the symptoms, and provide the platform for a process of psychological resolution.

Murray R, et al., eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 302.
Kapur, S. Psychosis as a state of aberrant salience: a framework linking biology, phenomenology, and pharmacology in schizophrenia. *American Journal of Psychiatry* 2003; **160**: 13–23.

24.C. DSM-IV-TR research criteria require both severe muscle rigidity and elevated temperature to be present following recent administration of an antipsychotic. In addition, at least two associated signs, symptoms, or laboratory findings must be present. The associated symptoms listed in DSM research criteria include diaphoresis, dysphagia, tremors, incontinence, mutism, tachycardia, elevated blood pressure, leucocytosis, changes in the level of consciousness, and laboratory evidence of muscle injury. NMS must be distinguished from serotonin syndrome. NMS is an idiosyncratic reaction to therapeutic dosages of neuroleptic agents, whereas serotonin syndrome is a toxic reaction due to overstimulation of 5-HT_{2a} receptors; distinguishing features include bradykinesia and lead pipe rigidity in NMS, whereas hyperkinesia and myoclonus are evident in serotonin syndrome.

Kay J and Tasman A. *Essentials of Psychiatry*. John Wiley and Sons, 2006, p. 833.

25.A. Nocturnal panic refers to waking from sleep with an abrupt and discrete sense of intense fear accompanied by cognitive and physical symptoms of arousal. It does not differ significantly from panic attacks that occur during wakeful states. Most patients with nocturnal panic experience panic attacks during wakeful states too. But a small subset with predominantly circumscribed nocturnal panic has been described. Most patients report that nocturnal panic occurs between 1 and 3 hours after sleep onset. It is a non-REM event, usually occurring in late Stage II or early Stage III sleep. It is not accompanied by any electroencephalographic abnormalities.

Kay J and Tasman A. *Essentials of Psychiatry*. John Wiley and Sons, 2006, p. 750.
Craske M and Tsao J. Assessment and treatment of nocturnal panic attacks. *Sleep Medicine Reviews* 2005; **9**: 173–184.

26.B. Disrupted sleep architecture is a long-recognized feature of mood disorders. Several sleep-related electroencephalogram (EEG) changes have been noted in around 90% of those with depression. Short REM latency, increased amount of REM sleep, increased REM density, especially in the first REM episode, prolonged sleep latency, increased frequency of awakenings with low arousal threshold, reduced slow-wave sleep, and shifting of delta sleep to second-stage NREM sleep are some of the notable changes. Some reports have suggested that bipolar depression may be atypical with respect to sleep changes in that daytime sleepiness and increased sleep efficiency are reported. In hypomania/mania, short REM latency, inability to fall asleep, short sleep duration, and reduced delta sleep are seen. In patients who have secondary depression due to a chronic medical condition, REM sleep may be reduced.

Kay J and Tasman A. *Essentials of Psychiatry*. John Wiley and Sons, 2006, p. 750.

27.C. Normally REM sleep is associated with loss of muscle tone (atonia) and dreaming. In some patients, as an isolated condition or as a prodrome for later neurodegenerative disorders such as Lewy body dementia/Parkinson's disease, this normal atonia is absent. This then leads to 'dreams being acted out' with uncontrolled limb movements. This is called REM sleep behavioural disorder. Patients can recall dreams when awakened, unlike sleep terror. The behaviours may be more complex than simple sleepwalking. Periodic limb movement disorder is characterized by periodic episodes of repetitive and stereotyped limb movements that occur during sleep. These movements can cause clinical sleep disturbance expressed by insomnia or excessive daytime sleepiness. This is not a dream-related behaviour, unlike REM sleep behavioural disorder. Restless legs syndrome, in simplistic terms, is the daytime extension of periodic limb movement disorder wherein episodic akathisia and motor restlessness are seen during the day and at night.

Kay J and Tasman A. *Essentials of Psychiatry*. John Wiley and Sons, 2006, p. 748.

28.D. Pharmacological treatment options for restless leg syndrome include dopaminergic agents (L-dopa, pergolide, pramipexole), anticonvulsants (gabapentin, carbamazepine), certain opioid drugs, and clonazepam. Amitriptyline has no role in the management of restless leg syndrome. An increase in periodic limb movements observed during sleep has been reported as a side-effect of tricyclics. Some patients may report new-onset restless leg syndrome in association with SSRIs or tricyclics when treated for depression.

Kay J and Tasman A. *Essentials of Psychiatry*. John Wiley and Sons, 2006, p. 747.

29.A. It is important to realize that clear-cut demarcations between psychogenic or organic erectile dysfunctions are difficult to ascertain in clinical practice. But certain clues that may favour a psychogenic origin/overlay of erectile dysfunction include sudden onset of the problem, early collapse of erection (as against complete absence of tumescence), preserved spontaneous (early morning) and self-stimulated erections, antecedent (temporally related) problems or changes in relationship, a history of significant preceding or ongoing life events, and evidence of psychological problems. Clues that may indicate an organic aetiology include preserved ejaculation in spite of impaired erection, unperturbed libido (in the early stages), and a history of antecedent physical injury, surgeries, or vascular risk factors in the medical history, smoking, and other prescribed or recreational drug use.

Lue TF. Erectile dysfunction. *New England Journal of Medicine* 2000; **342**: 1802–1813.

30.D. Apomorphine is a dopamine receptor agonist which stimulates both dopamine D1 and D2 receptors and is sometimes used in male erectile dysfunction. Phosphodiesterase-5 (PDE-5) is an enzyme found in the trabecular smooth muscle of the penis. It catalyses the degradation of cGMP, which results in an elevated cytosolic calcium concentration and muscular contraction leading to erection. PDE-5 inhibitors such as sildenafil, vardenafil, and tadalafil block this biochemical pathway to promote erection. Sildenafil and vardenafil must be taken 1 hour before sexual activity to enable their action. Alprostadil is prostaglandin E₁, which causes smooth muscle relaxation and subsequent vasodilation by acting on adenylate cyclase to increase the intracellular cyclic adenosine monophosphate (cAMP) concentration. Yohimbine is not commonly used for erectile dysfunction; it is an adrenergic antagonist relatively selective for alpha-2 receptors. The site of action of yohimbine when used for erectile dysfunction is suspected to be central rather than peripheral as the predominant subtype of alpha-adrenoceptor in penile erectile tissue is alpha-1 type rather than alpha-2 type.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 682.

31.C. Not everyone who experiences a traumatic event goes on to develop PTSD. It is difficult to predict exactly who will go on to develop PTSD. Two factors most associated with future risk of PTSD in those exposed to trauma are perceived lack of social support and peritraumatic dissociation. The possibility of predicting PTSD has led to designing of predictive screening instruments to be used shortly after a traumatic event. The 10-item Trauma Screening Questionnaire (TSQ) is one of the best validated. The TSQ is a predictive screening instrument for victims of violent crime 1–3 weeks after the assault. In spite of high rates of sensitivity and specificity, a lower positive predictive value (around 0.48) means that although the TSQ can detect the vast majority of PTSD sufferers at 1 month, 50% of those who screened positive will not develop PTSD. Other scales listed in the question are not used directly for predicting PTSD. The Holmes and Rahe Social Adjustment Scale is used to measure the impact of life events by means of arbitrary values attached to different types of common life events. The Life Events and Difficulties scale is used to measure the contextual threat posed by life events. Appraisal of the Life Events Scale is designed to provide an index of the three primary appraisal dimensions (threat, challenge, and loss) described in Lazarus and Folkman's transactional model of stress. The Abbreviated Injury Scale is an anatomical scoring system used to classify motor accident victims to enable emergency physical interventions.

Walters JTR, Bisson JI and Shepherd JP. Predicting posttraumatic stress disorder: validation of the Trauma Screening Questionnaire in victims of assault. *Psychological Medicine* 2007; **37**: 143–150.

32.C. Niacin (nicotinic acid) is a water-soluble vitamin used as a drug for hyperlipidaemia. It can induce a visible skin flush response that is caused by prostaglandin-mediated cutaneous vasodilatation. This normal flush response is reduced in patients with schizophrenia. The use of niacin challenge as a simple biochemical test for schizophrenia has been proposed. Depending on the criteria used, the prevalence rates of attenuated or absent response to a niacin skin patch in patients with schizophrenia ranged from 49% to 90%, compared with 8% to 23% in healthy control subjects. This abnormal flush response has also been reported in first-degree relatives of schizophrenia patients. The estimated heritability ranges from 47% to 54%. The attenuated flush response to a niacin patch seen in schizophrenia patients was not observed in patients with depression, bipolar disorder or autism. The reduced niacin flush response in patients with schizophrenia was not affected by medication status, antipsychotic drug doses, or substances such as cigarette, coffee, or alcohol consumption.

Chang S, et al. Impaired flush response to niacin skin patch among schizophrenia patients and their nonpsychotic relatives: the effect of genetic loading. *Schizophrenia Bulletin* 2009; **35**: 213–221.

33.A. Tryptophan depletion is used as an intervention to deplete serotonin (5-HT) in humans. It is noted to reverse the antidepressant effects of SSRIs and monoamine oxidase inhibitors (MAOIs) in patients in remission with a history of depression but not in patients treated with antidepressants that promote catecholaminergic rather than serotonergic neurotransmission (such as tricyclic antidepressants, reboxetine, or bupropion). Patients who are either unmedicated and/or fully remitted are much less likely to experience relapse than patients who are recently medicated and partially remitted. Recently remitted patients who have been treated with non-pharmacological therapies such as total sleep deprivation, electroconvulsive therapy, or phototherapy and possibly CBT do not commonly show full clinical relapse with tryptophan depletion.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 64.

O'Reardon JP, et al. Response to tryptophan depletion in major depression treated with either cognitive therapy or selective serotonin reuptake inhibitor antidepressants. *Biological Psychiatry* 2004; **55**: 957–959.

34.B. An increased density of 5HT₂ binding sites has been shown in post-mortem studies of depressed/suicidal patients. The increase in 5HT_{2A} receptors is most prominent in the dorsolateral prefrontal cortex and in platelets of medication naïve patients. A reduction in 5HT_{1A} receptors has also been noted in the cortex. In contrast, long-term antidepressant treatment has been shown to reduce 5HT₂ receptors and increase 5HT_{1A} function. But these changes may not be causative in antidepressant action as they pre-date any clinical response in those who have started antidepressant therapy. Of note, ECT treatment actually increases 5HT_{2A} receptors. Most directly acting 5HT_{1A} agonists have poor antidepressant activity. Chronic antidepressant treatment induces a reduction in β adrenoreceptor density around 2 weeks after starting antidepressants; this correlates with therapeutic effects. Unmedicated suicide victims show a greater density of β adrenoreceptors.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 64–65.

35.D. The severity of lithium toxicity has a feeble relationship, if any, with levels of serum lithium. Neurotoxicity can occur even within therapeutic levels of lithium. The symptoms of lithium toxicity can be grouped into gastrointestinal symptoms such as nausea, diarrhoea, vomiting; neurological symptoms such as severe tremors (coarse), cerebellar ataxia, slurred speech, myoclonus, and spasticity; mental symptoms such as drowsiness, disorientation, and apathy. Most patients make a full recovery when lithium is stopped but serum levels may continue to rise due to intracellular lithium release even after cessation of treatment. Rarely, persistent cerebellar damage and cognitive impairment are reported following lithium toxicity.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 37.

36.A. Amitriptyline has the highest affinity for central muscarinic acetylcholine receptors among various antidepressants. Its affinity is nearly one-tenth of the affinity shown by atropine. This is followed by protriptyline and clomipramine. Trazodone has very low muscarinic affinity. Anticholinergic side-effects of tricyclics include dry mouth, blurred vision, urinary retention, constipation, memory impairment, and confusion especially in elderly people.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 85.

37.D. One in every 100 000 patients treated with monoamine oxidase inhibitors such as tranylcypromine die due to fatal hypertensive reaction. The fatality rate can also be expressed as 1 in every 8000 hypertensive reactions. The so-called ‘cheese reaction’ is mainly characterized by skin flushing, tachycardia, dyspnoea, sweating, hypertension, conjunctival injection, and headache. The reaction is usually self-limiting, with signs and symptoms lasting from few minutes to a few hours. Tyramine is formed by the decarboxylation of the amino acid tyrosine; it is mainly catabolized via oxidation by monoamine oxidase-A (MAO-A) in man. Thus MAO-A acts as a protective barrier against high tyramine levels in the nervous system. Unmetabolized tyramine is transported into adrenergic nerve terminals where it displaces noradrenaline, causing hypertension.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 91.

38.C. Data from the Office of National Statistics from 1993–2002 have demonstrated a significantly higher rate of fatal overdose (fatal toxicity index) with the antidepressant venlafaxine than with SSRIs. Venlafaxine has a similar lethality to TCAs in cases of overdose; most deaths are ascribed to cardiac effects of the drug. Overall, approximately 10% of venlafaxine overdoses that are reported have proven fatal. Blood pressure increases are common in therapeutic doses but severe increases do not appear to be a significant feature of overdose. Fatal toxicity indices (FTIs) are calculated using recorded deaths attributed to drug overdose obtained from prescribing data. TCAs (in particular dothiepin) have been associated with a higher FTI than venlafaxine, which in turn has been associated with a higher FTI than SSRIs.

Medicines and Healthcare Products Regulatory Agency. Updated prescribing advice for venlafaxine Effexor/Effexor XL (Accessed 28 December 2008 www.mhra.gov.uk).

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 95.

39.C. In the 'lorazepam challenge test' (coined by George Bidder), an intravenous line is established and a syringe containing 2–4 mg of lorazepam in 2 mL of solution is prepared, and 1 mg is injected. In the next 2–5 minutes if no reduction is observed in catatonic features, the second 1 mg of lorazepam is injected, and the assessment is repeated. It is noted that more than 80% of patients with catatonia have a rapid reduction in symptoms with an intravenous lorazepam challenge. Such a response to lorazepam typically results in a lorazepam treatment trial, followed by electroconvulsive therapy if substantial relief is not maintained. Fink and Taylor suggest that adhering to this algorithm achieves remission of catatonia in almost all patients. Amytal interview using intravenous barbiturates/benzodiazepines has been used in dissociative amnesia/fugue.

Bush G, et al. Catatonia, II: treatment with lorazepam and electroconvulsive therapy. *Acta Psychiatrica Scandinavica* 1996; **93**: 137–143.

Fink M and Taylor MA. Catatonia: subtype or syndrome in DSM? *American Journal of Psychiatry* 2006; **163**: 1875–1876.

40.B. The syndrome of malignant catatonia is severe form of catatonia characterized by fever, muscle rigidity and autonomic instability and can be fatal (through renal failure, pulmonary embolism or arrhythmias) if not treated promptly. It is indistinguishable from neuroleptic malignant syndrome. ECT is the treatment of choice. Laboratory studies often help to assess the overall health of a catatonic patient; they rarely help in identifying the cause or confirm the diagnosis of catatonia in isolation. Elevated levels of creatinine phosphokinase (CPK), elevated liver enzymes, and leucocytosis are some of the changes noted in patients with malignant catatonia. Low serum iron levels are associated with malignant catatonia; it is also observed in some patients with neuroleptic malignant syndrome. Serum calcium and magnesium levels are either normal or low in catatonia.

Ananth J, et al. Neuroleptic malignant syndrome: risk factors, pathophysiology, and treatment. *Acta Neuropsychiatrica* 2004; **16**: 219–228.

41.E. Medication resistance and chronicity of depression are two often noted factors that predict lower response rates to ECT. Though ECT can provide significant benefit for patients who are resistant to medication, the degree of response may be less than in depressed patients who are not considered to have such resistance. Similarly, patients with longer durations of continuous depressive illness are less likely to respond to ECT. Post-ictal suppression and ictal amplitude are two main EEG-related features during ECT treatment that are associated with positive efficacy. Post-ictal suppression refers to the acute fall in EEG amplitude immediately after the ECT-induced seizure terminates. Ictal EEG amplitude or power measured as voltage is felt to be related to seizure strength or intensity. Bipolar depression does not respond to ECT differently from unipolar depression when other variables are controlled for.

Tyler P and Silk K, eds. *Cambridge Textbook of Effective Treatments in Psychiatry*. Cambridge University Press, 2008, p. 62.

Daly JJ, et al. ECT in bipolar and unipolar depression: differences in speed of response. *Bipolar Disorders* 2001; **3**: 95–104.

42.C. SSRIs are now widely used as first-line agents in social anxiety disorder – both limited and generalized subtypes. An adequate trial of treatment with SSRIs in social anxiety must extend to 12 weeks, with a minimum of 6–8 weeks at the highest tolerated doses administered before considering a switch. It may take many months to consolidate a full treatment response and achieve a full remission. If the treatment is effective, it is recommended that it be continued for at least for a year, and then very gradually tapered off.

Murray R, et al, eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 158.

Ballenger JC, et al. Consensus statement on social anxiety disorder from the International Consensus Group on Depression and Anxiety. *Journal of Clinical Psychiatry* 1998; **59**: 54–60.

43.A. The amount of evidence for treatment of body dysmorphic disorder (BDD) is limited, but it is accepted that serotonin reuptake inhibitors (SSRIs) and cognitive-behavioural therapy (CBT) are the treatments of choice. Antidepressants, antipsychotics, or electroconvulsive therapy are not efficacious for BDD, even though the data are limited. BDD symptoms of delusional patients appear as likely as symptoms of non-delusional patients to respond to an SSRI. SSRIs improve preoccupations, distress, and insight with an associated reduction in BDD-related behaviours such as mirror-checking, etc. The patient need not have depression to experience the beneficial effect. Although data are limited with respect to dose-finding studies, it is accepted that BDD often requires higher SSRI doses than those typically used in the treatment of depression, with variable response times ranging from 4–5 weeks to 9 weeks. Many patients may thus require longer than the usual treatment trial.

Phillips KA. Pharmacologic treatment of body dysmorphic disorder: review of the evidence and a recommended treatment approach. *CNS Spectrums* 2002; **7**: 453–60.

44.E. Elevations of serum amylase have been reported in 25–60% of anorexic/bulimic patients who repeatedly vomit. This amylase appears to derive from the salivary fraction and not the pancreas. Thus it may be associated with a clinical finding of parotid gland enlargement. The use of serum amylase measurement as an index of clinical symptomatology in eating disorders is currently limited as the correlation between amylase levels and symptom severity is poor. Low urea levels are seen in restricting the type of anorexia; they may be increased in those who vomit repeatedly. Hypokalaemia is a feature of laxative abuse or repeated vomiting in anorexia. High bicarbonate levels are associated with vomiting whereas low levels are seen in laxative abuse. Thyroid hormone (T3) is reduced in anorexia; basal TSH values and thyroxine levels may be normal (low T3 syndrome).

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 621.
Fairburn CG and Harrison PJ. Eating disorders. *Lancet* 2003; **361**: 407–416.

45.C. Refeeding syndrome refers to severe electrolyte and fluid shift associated with metabolic abnormalities in patients with malnutrition undergoing realimentation. Refeeding syndrome can occur in people with eating disorders and alcoholism but it is often missed in psychiatric units. This patient has developed features of low phosphate and thiamine deficiency following realimentation. The clinical features are related to the shift in metabolism that occurs on refeeding. A change from fat to carbohydrate-based energy production occurs. A glucose load stimulates insulin release, causing increased cellular uptake of glucose, phosphate, potassium, magnesium, and water. This will result in hypophosphataemia, which in turn may cause a deficit in adenosine triphosphate (ATP) with widespread neuromuscular and haematological consequences. Thiamine deficiency occurs due to increased cellular utilization of thiamine in response to carbohydrate refeeding and is associated with the precipitation of Wernicke's encephalopathy.

Catani, M and Howells, R. Risks and pitfalls for the management of refeeding syndrome in psychiatric patients. *Psychiatric Bulletin* 2007; **31**: 209–211.

46.D. Non-organic visual loss may be psychogenic (conversion phenomenon) or secondary to malingering. It is more common among younger age groups and females, with the most frequently reported complaints being a reduction of visual acuity with or without loss of field. Absence of underlying optic nerve pathology is suggested by the demonstration of normal evoked potentials. On visual field testing the patients may have an inconsistent spiral field. When the patient acknowledges sighting the stimulus at some point on a horizontal axis, the examiner then moves around the field in a circle (clockwise or anticlockwise). This will produce a progressively constricting field and when the same horizontal axis is reached again, the stimulus will only be sighted at a much closer point to the centre. Some patients may have tubular vision. In the presence of true visual field loss, the area of constricted field expands with increasing distance of the testing screen. In non-organic visual loss such field defects remain unchanged in width when tangent screen testing is performed at varying distances. This produces what is known as 'tubular fields'. Simple tests of proprioception such as the finger–nose test are easily performed by blind patients; in non-organic visual loss, patients may be incapable of carrying out these tests. Intact vision (acuity at least 6/60) will elicit a positive optokinetic nystagmus (eyes moving with a black/white striped drum rolling in front of the eyes). The absence of such nystagmus indicates an ocular rather than psychogenic cause for visual loss.

Beatty S. Psychogenic medicine: Non-organic visual loss. *Postgraduate Medical Journal* 1999; **75**: 201–207.

47.D. Taijin Kyofusho (or anthropophobia: a fear of interpersonal relationships) could be considered as a cultural expression of social phobia among Japanese. Hikikomori, manifest by complete withdrawal from social life, is very closely related. Patients show severe obsession and fear of social contact with extreme self-consciousness regarding appearance, blushing, stuttering, or emitting offensive odours. Brain fag syndrome (known as studiation madness in the Caribbean) is characterized by variety of medically unexplained somatic symptoms, anxiety, depression, and fatigue. Symptoms may be triggered by the effort of reading; it is seen in students from a West African background. Dhat syndrome is characterized by complaints of discharge of semen in urine with no urological cause; this may be associated with fatigue and anxiety of loss of fertility and reproductive potency. Frigophobia (Pa-Leng) is a chronic anxiety state with phobia for cold; the patients may dress compulsively in heavy clothes and may become housebound for the fear of 'cold attack'. Arctic hysteria or Piboloktoq is an acute dissociative episode of disruptive behaviour characterized by an irritable prodromal period and subsequent wild, excited, and risky behaviour.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 806.

48.B. Both muscarinic M3 and M4 receptors are expressed in salivary glands. In general, stimulation of these receptors leads to increased salivation. Clozapine has antagonistic properties at muscarinic receptors (M1 to M3, and M5) but acts as an agonist at the M4 receptor. Olanzapine also has direct M4-agonistic properties and can produce hypersalivation; pirenzepine, an M4 antagonist, alleviates hypersalivation. In addition, clozapine may exacerbate salivation through its alpha-2 antagonism.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 255.

49.E. Clozapine is mostly metabolized via the CYP1A2, 3A4, and 2C19 enzymes. Cigarette smoking and caffeine induce CYP1A2; this can reduce clozapine levels in plasma. Rifampicin, carbamazepine, and phenytoin induce CYP3A4 and thus reduce clozapine levels. Erythromycin inhibits CYP3A4 and ciprofloxacin inhibits CYP1A2; both increase clozapine levels.

Stein G and Wilkinson G, eds. *Seminars in General Adult Psychiatry*, 2nd edn. Gaskell, 2007, p. 254.

50.C. Depression is associated with many neuroendocrine changes in hypothalamic-pituitary-adrenal cortex axis. Raised cortisol (measured in blood or saliva), abnormal dexamethasone suppression test (non-suppression of cortisol levels after overnight dexamethasone administration), and abnormal dexamethasone–corticotrophin releasing hormone (CRH) response (mediated via reduced ACTH response to CRH infusion), raised CRH levels in cerebrospinal fluid and down regulated CRH receptors are some of the reported changes.

Murray R, et al, eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 268.

chapter
2

FORENSIC AND REHABILITATION PSYCHIATRY

QUESTIONS

- 1. Which of the following is true with regard to the association between schizophrenia and recorded crime rates?**
 - A. The risk is increased for non-violent crimes only
 - B. The risk is increased for violent but not non-violent crimes
 - C. The risk of crime is increased for narrow diagnosis of schizophrenia rather than broad diagnosis of psychosis
 - D. The association is seen only for less serious violent acts
 - E. The risk is highest for violent crimes for both narrowly defined schizophrenia and broadly defined psychosis
- 2. All of the following factors are significantly associated with increased risk of violence among those with schizophrenia except**
 - A. Comorbid substance use
 - B. Comorbid personality disorder
 - C. Acute psychotic symptoms
 - D. Non-compliance with treatment
 - E. Comorbid depression
- 3. Which of the following is true about the epidemiology of violence in schizophrenia?**
 - A. Most offenders with schizophrenia offend for the first time after the onset of illness
 - B. Most offenders with schizophrenia have delusions directly relevant to violence
 - C. Most offenders with schizophrenia do not have substance use problems
 - D. Most offenders with schizophrenia do not reoffend if the illness is diagnosed
 - E. The risk factors increasing violence is similar in both schizophrenia and non-schizophrenia populations
- 4. The amount of societal violence rate that can be ascribed to psychiatric illness is**
 - A. 1 in 10
 - B. 1 in 20
 - C. 1 in 5
 - D. 1 in 2
 - E. 1 in 100

5. With respect to population-attributable risk of violence in those with schizophrenia, which of the following is true?

- A. It is a more important public health measure than relative risk
- B. It increases with increasing overall crime rates
- C. Most crimes in Europe are committed by those with schizophrenia
- D. It decreases with increasing overall crime rates
- E. It represents the amount of crime that would remain if schizophrenia is completely eliminated from a population

6. The term filicide refers to

- A. Killing of father by son
- B. Killing of a sister by another
- C. Killing of husband by wife
- D. Killing of a child by mother
- E. Killing of a parent by child

7. To be applied successfully the fitness to plead criteria must be found relevant to a defendant at the time of

- A. The criminal offence
- B. The trial proceedings
- C. Being interviewed in custody
- D. Sentenced imprisonment
- E. The arrest

8. Which of the following refers to assessment of medical negligence?

- A. McNaughton's criteria
- B. MacArthur's competency assessment tool
- C. Pritchard's criteria
- D. Hare's checklist
- E. Bolam criteria

9. A 'trial of facts' takes place in which of the following conditions?

- A. Defendant is highly suggestible
- B. Defendant is unfit to plead
- C. Defendant has learning disability
- D. Defendant has amnesia for the event of crime
- E. Defendant is found not guilty by reason of insanity

10. Which of the following is a structured clinical risk assessment tool used in a forensic setting?

- A. Psychopathy Check List – Revised
- B. Violence Risk Appraisal Guide (VRAG)
- C. Iterative classification tree
- D. HCR-20
- E. Minnesota Multiphasic Personality Inventory (MMPI)

11. Which of the following is true with regard to VRAG?

- A. It incorporates HCR-20 as a subscale
- B. It contains 24 items
- C. Presence of schizophrenia is a predictor of lower risk
- D. Psychopathy is not included as a predictor
- E. It is a structured clinical risk assessment tool

12. Which of the following is true with regard to the association between learning disability and offending?

- A. Above average IQ is an independent risk factor for offending
- B. Severity of learning disability correlates with severity of the offence
- C. Degree of learning disability correlates with rate of offending
- D. Homicide is the most common offence committed by those with a learning disability
- E. Substance abuse is associated with a risk of offending among the learning disabled

13. The proportion of male remand prisoners in England and Wales with at least one personality disorder is

- A. 20%
- B. 10%
- C. 50%
- D. 33%
- E. 80%

14. The McNaughton rules are often discussed when a defence of insanity is used. Which of the following is NOT a factor that can be used for the insanity defence under the McNaughton rules?

- A. Disease of the mind
- B. Defect of reason
- C. Not knowing the nature and quality of the act
- D. Defect of moral judgement
- E. Absence of knowledge that the act is wrong

15. Which of the following statements is true with regard to the relationship between antisocial personality disorder and psychopathy?

- A. A minor subgroup of those with psychopathy have anti-social personality disorder
- B. All those with antisocial personality are psychopathic
- C. Only multiple homicide offenders can be classified as psychopathic
- D. Antisocial personality is a better predictor of violence risk than psychopathy
- E. Impulsive aggression is more common in those with antisocial personality without psychopathy

16. Various neurobiological abnormalities have been documented in those with psychopathy. Which of the following is one such feature?

- A. Reduced fear-based learning
- B. Increased baseline autonomic arousal
- C. Reduced verbal IQ
- D. Increased reactive autonomic arousal on stimulation
- E. Increased P300 differentiation between target and non-target stimuli

17. Which of the following is associated with a risk of aggression or violent behaviour in those without serious mental illness?

- A. Neurological soft signs
- B. Executive function deficits
- C. Minor physical anomalies
- D. Obstetric complications in pregnancy
- E. All of the above

18. In those who experience childhood maltreatment which of the following has been associated with a later risk of antisocial behaviour?

- A. Serotonin transporter polymorphism
- B. MAO enzyme polymorphism
- C. Dopamine receptor polymorphism
- D. COMT polymorphism
- E. Trinucleotide repeats in chromosome X

19. The most common group of mental disorders diagnosed among homicide offenders is

- A. Personality disorders
- B. Substance use disorders
- C. Schizophreniform disorders
- D. Affective disorders
- E. Learning disabilities

20. The proportion of those who commit homicide who are in contact with mental health services within the previous year is

- A. 1–4%
- B. 8–11%
- C. 40–43%
- D. 60–63%
- E. 80–86%

21. Compared with homicide perpetrators who kill those who are known to them, perpetrators who kill strangers are more likely to

- A. Have a history of mental disorder
- B. Have a history of contact with mental health services
- C. Be a young female
- D. Have psychiatric symptoms at the time of offence
- E. Have a history of drug misuse

22. Which of the following is true with regard to men convicted of a sexual offence compared with men with no history of sexual offences in the general population?

- A. Sexual offenders have a similar risk for psychiatric hospitalization
- B. Sexual offenders have lower rates of schizophrenia
- C. Sexual offenders have higher rates of psychotic disorders
- D. Only organic psychiatric conditions are more prevalent among sexual offenders
- E. Sexual offenders have a reduced risk of bipolar disorder

23. Elderly offenders are often an under-researched population compared with working age offenders. Which of the following is true regarding elderly sex offenders?

- A. Elderly sex offenders have higher rates of mental illness than non-sex offenders
- B. Elderly sex offenders have increased schizoid traits compared with non-sex offenders
- C. Sex offending in elderly people is associated more with organic brain disease
- D. Elderly sex offenders have increased antisocial traits compared with non-sex offenders
- E. There is an equal gender distribution among elderly sex offenders

24. Which of the following statements is true with respect to reduction in the risk of violence associated with schizophrenia?

- A. Newer antipsychotics reduce violence more than typical antipsychotics
- B. Violence risk is not modified by antipsychotic medications
- C. Medication adherence reduces risk of violence
- D. Olanzapine has the best evidence for reducing violence risk among atypical antipsychotics other than clozapine
- E. Typical antipsychotics increase the overall risk of violence

25. The most important difference between legally determined non-insane automatisms and insane automatisms is

- A. Treatability
- B. Recurrence risk
- C. Presence of intent
- D. Degree of crime
- E. Impulsivity

26. With respect to morbid jealousy, the correct statement among the following is

- A. It is always a delusional disorder
- B. It is coded separately in ICD-10
- C. It is coded separately in DSM-IV
- D. It is classified as a paraphilia
- E. It is associated with amphetamine use

27. The most common relationship a victim may have with his/her stalker is

- A. Ex-partner
- B. Employer
- C. Medical practitioner
- D. Unrelated stranger
- E. Casual acquaintance

28. Which of the following ICD-10 diagnoses has a well-demonstrated causal association leading to stalking behaviour?

- A. Obsessive-compulsive disorder
- B. Delusional disorder
- C. Depressive disorder
- D. Organic brain disorders
- E. Pervasive developmental disorder

29. It is found that criminal parents are at higher risk of having delinquent children. Which of the following is a correct statement in this regard?

- A. Most criminal parents directly encourage crime in their children
- B. Most criminal parents do not mind if their children commit a criminal offence
- C. Findings of genetic transmission in delinquency have been shown to be robust
- D. Poor parental supervision from criminal parents increases delinquency rates
- E. Parents and children get convicted for the same crime more often than not

30. All of the following features are supportive of violence occurring during epileptic automatism except

- A. Violent behaviour provoked by the victim
- B. Presence of impaired consciousness
- C. Poorly directed behaviour
- D. Stereotyped motor acts preceding violent behaviour
- E. Evidence of amnesia for the behaviour

31. An offender with a history of repeated arson admits to deliberate fire-setting, which is preceded by a certain degree of arousal. He has had a fascination with fire since childhood and achieves a sense of gratification when setting fires. He does not have antisocial personality disorder or substance use. The most appropriate diagnosis is

- A. Obsessive compulsive disorder
- B. Pyromania
- C. Intellectual disability
- D. Intermittent explosive disorder
- E. Sadistic personality disorder

- 32. During the proceedings of a court trial it becomes evident that a murder victim had the habit of achieving sexual excitement from being humiliated and beaten after being bound and verbally abused. This is consistent with**
- A. Voyeurism
 - B. Sadism
 - C. Masochism
 - D. Fetishism
 - E. Hypoxyphilia
- 33. In people with kleptomania which of the following medications has been demonstrated to be the most useful in double-blinded randomized controlled trials?**
- A. Fluoxetine
 - B. Olanzapine
 - C. Lithium
 - D. Naloxone
 - E. None of the above
- 34. The proportion of adults with a history of childhood conduct disorder who satisfy the criteria for antisocial personality disorder in cross-sectional interviews is**
- A. 75%
 - B. 10%
 - C. 20%
 - D. 3%
 - E. 95%
- 35. Among all homicides committed by those with psychotic illnesses, the proportion committed by those with a first episode psychosis and receiving no treatment is**
- A. 1 in 10
 - B. 2 in 10
 - C. 4 in 10
 - D. 7 in 10
 - E. 9 in 10
- 36. Among various mental disorders seen in shoplifters, the strongest association is seen for**
- A. Borderline personality disorder
 - B. Antisocial personality disorder
 - C. Schizophrenia
 - D. Depression
 - E. Kleptomania

37. A 43-year-old patient with a diagnosis of delusional disorder reveals that he intends to 'rip off' his neighbour, with whom he believes that his wife is having an affair. Which of the following is correct with regard to management of this patient?

- A. Police must not be informed to preserve confidentiality; wife can be informed
- B. Wife must not be informed to preserve confidentiality; police must be informed
- C. Police, wife, and, if needed, the neighbour must be informed
- D. Only the neighbour must be informed as there are no thoughts to harm the wife
- E. No one needs to be informed if the patient is legally detained in a hospital

38. The proportion of prisoners in English prisons with one or other diagnosable mental disorder is

- A. 30%
- B. 15%
- C. 45%
- D. 90%
- E. 5%

39. All of the following are true with regard to suicide of a homicide perpetrator except

- A. The suicide usually occurs within a week of murder
- B. It most commonly follows domestic homicides
- C. It follows child homicides more often than adult homicides
- D. It is most commonly associated with bipolar disorder
- E. An altruistic motive may be seen in elderly people

40. In UK prisons, the most common method of committing suicide is

- A. Hanging
- B. Poisoning
- C. Jumping from a height
- D. Gunshot injuries
- E. Self-immolation

41. In which of the following settings are anatomical dolls used to aid interview?

- A. Interviewing a learning-disabled adult for criminal offence
- B. Interviewing a child for diagnosing conduct disorder
- C. Interviewing an adult perpetrator of child abuse
- D. Interviewing a child for the possibility of sexual abuse
- E. Interviewing a child with suspected gender identity disorder

- 42. A patient with chronic schizophrenia has improved core signs and symptoms. His remaining symptoms are of such low intensity that they no longer interfere significantly with his behaviour. The burden of current symptoms is such that if assessed now using standard criteria, he would not be diagnosed as having schizophrenia, although his social and vocational functioning has not altered much over the course of treatment. Which of the following correctly describes this state?**
- A. Recovery
 - B. Remission
 - C. Deficit state
 - D. Lucid interval
 - E. Recrudescence
- 43. While measuring non-adherence to psychotropic medications, which of the following groups provides a subjective overestimate of the true adherence rates?**
- A. Patient group
 - B. Doctors treating the patients
 - C. Pharmacist
 - D. Both A and B
 - E. None of the above
- 44. According to the European schizophrenia cohort study, homelessness experienced by patients with schizophrenia is highest in**
- A. Germany
 - B. France
 - C. Great Britain
 - D. Belgium
 - E. Turkey
- 45. Which of the following is the major principle behind the original development of assertive community treatment?**
- A. Transfer of learnt social skills from the hospital to community setting is difficult
 - B. Social skills training in the hospital setting is costly
 - C. Training in community living is not a necessary component of rehabilitation
 - D. Vocational rehabilitation can only take place in the community
 - E. Cost of inpatient management is higher than the cost of community management
- 46. Subjective measures of quality of life (QOL) in patients with mental illness may be inaccurate because of**
- A. QOL scales always include depression and anxiety items
 - B. Reduced expectations may lead to claims of good QOL
 - C. QOL is not measurable using questionnaires
 - D. Subjective measures of QOL are not standardized
 - E. Response rate for subjective QOL measures is very low

- 47. Which of the following projects refers to promoting spontaneous recovery in schizophrenia without compulsory use of psychotropics?**
- A. Henderson hospital project
 - B. Soteria project
 - C. Partial hospitalization project
 - D. Utopia project
 - E. Melbourne PACE project
- 48. According to the health belief model of treatment compliance, patients consider all of the following factors when deciding upon treatment adherence except**
- A. Susceptibility to illness
 - B. Severity of illness
 - C. Perceived benefits
 - D. Probability of side-effects
 - E. Social criticism
- 49. The vocational rehabilitation programme with best evidence in schizophrenia is**
- A. Sheltered employment model
 - B. Supported employment model
 - C. Clubhouse model
 - D. Skills training model
 - E. Token economy model
- 50. The proportion of patients of working age with serious mental health problems who are employed actively in the UK is**
- A. 10%
 - B. 50%
 - C. 40%
 - D. 75%
 - E. 1%

chapter
2

FORENSIC AND REHABILITATION PSYCHIATRY

ANSWERS

1.E. Various types of studies have been hitherto employed to study the association between recorded crime and psychosis. One must remember that officially recorded crime may only be the tip of the proverbial iceberg in such studies. Various regional policies, jurisdictions, and practices affect the rate of recorded crime; in any case, these rates are not a true reflection of violence in the society. Many such studies have consistently found that a narrow diagnosis of schizophrenia or much broader psychosis have an increased risk of both non-violent and violent offending; this risk is greatest and most consistent for violent offences.

Murray R, et al., eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 541.

2.E. The risk factors associated with violence in mental illness is a favourite topic in MRCPsych exams. It has been cogently shown that the magnitude of risk associated with a combination of factors such as male sex, young age, and lower socioeconomic status in a mentally 'well' person with no psychiatric history is higher than the risk of violence presented by mental disorders *per se*. Despite varied research, the causal pathway from mental illness to violence is still poorly sketched. The most consistently established risk factors that further increase the risk of violence among schizophrenia patients are (a) comorbid substance abuse, (b) comorbid personality disorder, (c) non-compliance with medication, and (d) active psychotic symptoms. Depression does not seem to be a major mediator of violence in schizophrenia patients.

Walsh E, Buchanan A and Fahy T. Violence and schizophrenia: examining the evidence. *British Journal of Psychiatry* 2002; **180**: 490–495.

Murray R, et al., eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 544.

3.E. Most schizophrenia patients do not offend in direct response to delusions or hallucinations, although homicide offenders may be over-represented in those who are actively psychotic at the time of the offence. In general, schizophrenia patients who offend tend to have long histories of substance misuse, conduct problems, and delinquency, with extensive non-violent and violent offending prior to the onset of illness. Thus, the tendency to reoffend does not fall after a diagnosis of schizophrenia. The basic tenet one needs to remember regarding the epidemiology of violence in schizophrenia is that those risk factors for violence which operate in subjects without mental illness also operate in patients with schizophrenia.

Murray R, et al., eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 544.

4.B. Most research in forensic psychiatry has examined the relative risk of violence among the mentally ill compared with the general population. The population-attributable risk fraction (PAR%) refers to the percentage of violence in the population that can be ascribed to schizophrenia and thus could be eliminated if schizophrenia were eliminated from the population. Fazel and Grann (2006) reported that the population-attributable risk varied by gender and age in a given population. Overall, the PAR% of violence for psychiatric patients was 5.2%, suggesting that patients with severe mental illness commit 1 in 20 violent crimes. These data were obtained from analysing Swedish health registers between 1988 and 2000. This value may vary between countries and across various generations of birth cohorts.

Fazel S and Grann M. The population impact of severe mental illness on violent crime. *American Journal of Psychiatry* 2006; **163**: 1397–1403.

5.D. The population-attributable risk of violence in those with schizophrenia is a more important public health measure than relative risk as it indicates how much violence/crime could be eliminated if mental illness is ‘eliminated’. It provides an easier and more accurate reflection than relative risk for the general public. When the crime rates in a society increase, the population-attributable risk due to any mental illness reduces. The population-attributable risk fraction of violence for mental illness rate is estimated as 5% using Swedish registers; this suggests that most crimes in Europe are not related to mental illness.

Murray R, et al., eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 544.

6.D. The killing of a child by its mother is very rare and is called filicide. It is linked to depressive disorders more than any other mental illness. Patricide refers to the act of killing one’s father. Sororicide is the act of killing one’s sister. Matricide is the killing of one’s mother and maricide is killing of one’s spouse. Fraternicide refers to killing one’s brother.

Murray R, et al., eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 545.

7.B. The five criteria currently used in court in England and Wales to determine fitness to plead have remained unchanged for over 150 years. These are collectively termed Pritchard’s criteria: (1) ability to plead; (2) ability to understand evidence; (3) ability to understand the court proceedings; (4) ability to instruct a lawyer; (5) knowing that a juror can be challenged.

As the degree of mental illness can vary with time, its effect on fitness to stand trial can differ. Hence it is important to establish fitness/unfitness in the defendant as applicable at the time of the trial proceedings.

Rogers TP, Blackwood NJ, Farnham F, et al. Fitness to plead and competence to stand trial: a systematic review of the constructs and their application. *Journal of Forensic Psychiatry and Psychology* 2008; **19**: 576–596.

8.E. In the UK, the Bolam test has been the benchmark for assessing professional negligence since 1957. According to the Bolam test, ‘A doctor is not guilty of negligence if he has acted in accordance with a practice accepted as proper by a responsible body of medical men skilled in that particular art’. In other words, a doctor is not negligent if he is acting in accordance with such a practice, merely because there is a body of opinion that takes a contrary view. McNaughton’s test refers to the assessment of diminished responsibility in the wake of mental illness in court. The MacArthur competency assessment tool and Pritchard’s criteria are used for assessing fitness to plead. Hare’s checklist is used for the assessment of psychopathy.

Jones JW. The healthcare professional and the Bolam test. *British Dental Journal* 2000; **188**: 237–240.

9.B. If a defendant is found unfit to plead the likelihood of becoming fit is initially considered. If this is likely, e.g. following treatment, then the trial can be adjourned until such improvement occurs. If such improvement is unlikely, a jury trial of the facts takes place in the defendant's absence to determine whether the individual committed the alleged crime. If the individual is unfit to plead but at the end of the trial of facts it is established that he/she has committed the act, then one or other form of court disposal (e.g. a hospital order, supervision order or absolute discharge) is given.

Murray R, et al., eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 557.

10.D. HCR-20 (historical, clinical, risk management – 20) incorporates static historical risk factors, such as previous violence and early maladjustment, together with dynamic factors that may be particularly important in individual cases, such as level of insight and lack of personal support. It is a commonly used structured clinical risk assessment scale. VRAG is an actuarial tool that incorporates important predictors of reconviction studied in a sample of Canadian male offenders with mental disorder followed up for 7 years. PCL-R stands for the revised version of psychopathy checklist. It is used with HCR-20; it is not a stand-alone risk assessment instrument. MMPI is used as a psychometric tool for personality variables. The Iterative Classification Tree is an actuarial decision-making tool produced by Monahan et al. (2001) using data from the MacArthur risk assessment study. This tool uses many different combinations of bivariate risk factors to classify a person as high or low risk.

Dolan M and Doyle M. Violence risk prediction. Clinical and actuarial measures and the role of the Psychopathy Checklist. *British Journal of Psychiatry*, 2000; **177**: 303–311.

Monahan J. and Silver E. Judicial decision thresholds for violence risk management. *International Journal of Forensic Mental Health* 2003; **2**: 1–16.

11.C. VRAG is an actuarial risk tool that incorporates 12 items which are scored on the basis of a weighting procedure developed from the original study of Canadian prisoners. The variable with the heaviest weighting is the PCL-R psychopathy score, which is incorporated as a subscale. It does not use HCR-20 as a subscale. The factors positively associated with increased risk of recidivism are psychopathy score, history of elementary school difficulties, diagnosis of a personality disorder, young age, separation from parents prior to age 16, failure on prior conditional release, history of non-violent offences, never been married, and history of alcohol abuse. A diagnosis of schizophrenia is considered to reduce the overall risk of recidivism.

Dolan M and Doyle M. Violence risk prediction. Clinical and actuarial measures and the role of the Psychopathy Checklist. *British Journal of Psychiatry* 2000; **177**: 303–311.

12.E. Significantly below average intellectual ability is an independent predictor of future offending, irrespective of a diagnosis of learning disability (LD). Individuals with mild LD show a higher rate of offending than age- and sex-matched individuals without LD. No correlation has been found between the severity of intellectual disadvantage and the seriousness of the offence committed. In fact, individuals with more severe or profound learning disability rarely commit serious offences. Studies in the UK have shown a rate of 2–5% for recorded offences among the learning-disabled population. The degree of disability does not correlate with rate of offending. The most common offences by the learning-disabled group are property offences. Many risk factors that operate in the general population for risk of violence operate in the learning-disabled population, e.g. being young and male, a history of family offending, being unemployed, drug use, psychosocial disadvantage, etc.

Riding B, Swann C and Swann B, eds. *The Handbook of Forensic Learning Disabilities*. Radcliffe Publishing 2005, p. 124.

13.E. Almost 80% of male remand prisoners in England and Wales were found to have at least one personality disorder, with antisocial personality disorder being most prevalent. From the Office of National Statistics data (1997) the prevalence of any personality disorder was 78% for male remand prisoners, 64% for male sentenced prisoners and 50% for female prisoners (both sentenced and remand).

Antisocial personality disorder had the highest prevalence of any category of personality disorder (63% of male remand prisoners, 49% of male sentenced prisoners, and 31% of female prisoners) followed by paranoid personality disorder in men (29% of male remand prisoners, 20% of male sentenced, and 16% of female prisoners) and borderline personality disorder in women (20% of female prisoners). Compare these rates with a weighted prevalence for any personality disorder of 4.4% among people aged 16–74 years in households in England, Scotland and Wales.

Coid J, Yang M, Tyrer P et al. Prevalence and correlates of personality disorder in Great Britain. *The British Journal of Psychiatry* 2006; **188**: 423–431.

Singleton N, Meltzer H, Gatward R, et al. *Psychiatric Morbidity among Prisoners in England and Wales*. Stationery Office, 1998.

14.D. The McNaughton rules refer to a set of guidelines for the insanity defence that was used in England until the 1960s. According to these rules one can plead the defence of insanity only if 'at the time of committing the act, the accused was labouring under such a defect of reason from disease of the mind, as not to know the nature and quality of the act he was doing, or if he did know it then he did not know he was doing what was wrong'. Those who merely lack the capacity to control a criminal action could still be deemed punishable. Hence, a defect of moral judgement or failure to exercise existing capability to make the right decision cannot be brought up as an insanity defence under the McNaughton rules.

Murray R, Kendler K, et al., eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 558.

15.E. The constructs of psychopathy and antisocial or dissocial personality are often referred to interchangeably, but in reality these are quite different concepts. Approximately 3–5% of people in the general population would meet the criteria for antisocial personality. But less than 1% will meet the criteria for psychopathy (i.e. a high score (30/40) on the PCL-R). Similarly, although only 15% of male prisoners have scores that fall in the psychopathy range on the PCL-R, nearly 80% of them will satisfy the criteria for antisocial personality disorder. In other words, although most patients (81%) diagnosed as psychopaths by the PCL-R criteria met the criteria for a diagnosis of antisocial personality disorder, only a minority (nearly 35–40%) of those with antisocial personality receive a diagnosis of PCL-R psychopathy. The correlation between antisocial personality disorder and PCL-R scores was much higher for behavioural (social deviance: $r = 0.65$) factor of psychopathy than affective (interpersonal: $r = 0.39$) factor. Psychopaths are less impulsively aggressive than those with antisocial personality disorder, but are more likely to engage in antisocial behaviour of an instrumental nature. Those with psychopathy commit higher rates of serious violence and have strikingly high rates of recidivism than those with antisocial personality disorder but who are not psychopathic.

Ogloff JRP. Psychopathy/antisocial personality disorder conundrum. *Australian and New Zealand Journal of Psychiatry* 2006; **40**: 519–528.

Murray R, Kendler K et al., eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 547.

16.A. Various neurobiological findings have been demonstrated in those with psychopathy. These include impairments in appreciation of the emotional significance of external experience, strikingly low levels of baseline and reactive autonomic arousal and reduced fear-based learning. Although impaired verbal abilities have been demonstrated as a consistent risk factor for serious antisocial and delinquent behaviour, those with psychopathic traits often show serious antisocial behaviour, despite showing no impairment in their verbal abilities. In fact, Individuals who were high on callous-unemotional traits (a feature of psychopathy) with higher scores on the measure of verbal abilities reported the greatest violent delinquency in a sample of adolescent delinquents. For non-psychopathic individuals, a significant difference in P300 amplitude was noted between target and non-target stimuli. But in psychopathic individuals reliable P300 amplitude differences between the target and non-target visual conditions were not seen.

Muñoz LC, Frick PJ, Kimonis ER, et al. Verbal ability and delinquency: testing the moderating role of psychopathic traits. *Journal of Child Psychology and Psychiatry* 2008; **49**: 414–421.

Kiehl KA, Hare RD, Liddle PF, McDonald JJ. Reduced P300 responses in criminal psychopaths during a visual oddball task. *Biological Psychiatry* 1999; **45**: 1498–1507.

17.E. Even in those who are violent but do not have a demonstrable mental illness, the likelihood of having had a neurodevelopmental insult is high. This is shown by the presence of higher rates of minor physical anomalies in violently delinquent adolescents. Similarly, higher rates of neurological soft signs, maternal smoking during pregnancy, and obstetric complications have also been demonstrated. Defects in executive functioning and impulse control have also been shown to correlate with violence in the non-mentally ill samples.

Murray R, Kendler K et al., eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 549.

18.B. Children differ in their response to maltreatment in terms of future risk of criminal behaviour. Although maltreatment increases the risk of later criminality by about 50%, most maltreated children do not become delinquents or adult criminals. It is possible that certain genetic susceptibility factors could influence the causal pathway. Caspi et al. demonstrated that the effect of childhood maltreatment on antisocial behaviour was significantly weaker among males with high MAO-A activity than among males with low MAO-A activity. It was also shown that girls with a low MAO-A activity genotype but not those with high MAO-A activity were more likely to develop conduct disorder if they were maltreated. Hence, high MAO-A activity has a protective influence against maltreatment for both sexes.

Caspi A, McClay J, Moffitt TE, et al. Role of genotype in the cycle of violence in maltreated children. *Science* 2002; **297**: 851–854.

19.A. Depending on the definitions used, the rates of 'mental disorder' vary greatly among homicide offenders. The national confidential inquiry into suicide and homicide by people with mental illness in the UK established the frequency of mental illness in a complete national sample of homicides as 44% (lifetime history of mental disorder). At the time of the homicide, 14% had symptoms of mental illness. The most frequent diagnosis was personality disorder (11%), closely followed by alcohol dependence (10%) and drug dependence. Among major mental illnesses, affective disorders (10%) were more common than schizophrenia (7%).

Shaw J, Hunt IM, Flynn S, et al. Rates of mental disorder in people convicted of homicide. National clinical survey. *British Journal of Psychiatry* 2006; **188**: 143–147.

20.B. From the national confidential inquiry on homicide (1996–9) data, only 8–11% of the total sample of all homicide offenders ($n=1594$) were in contact with mental health services at some time in the preceding year. The main diagnoses in those with any previous contact with mental health services were schizophrenia (24%), personality disorder (18%), and depressive disorder (16%). Psychiatric reports were not available for nearly one-quarter of all homicide cases.

Shaw J, Hunt IM, Flynn S, et al. Rates of mental disorder in people convicted of homicide. National clinical survey. *British Journal of Psychiatry* 2006; **188**: 143–147.

21.E. The national confidential inquiry on homicide (1996–9) data found that 22% of all reported homicides were stranger homicides. In stranger homicides the perpetrator was more likely to be a young male and less likely to have a history of mental disorder or a history of contact with mental health services. They were also less likely to have psychiatric symptoms at the time of the offence than perpetrators of non-stranger homicides. They were more likely to have a history of drug or alcohol misuse.

Shaw J, Amos T, Hunt IM, et al. Mental illness in people who kill strangers: longitudinal study and national clinical survey. *British Medical Journal* 2004; **328**: 734–737.

22.C. Traditional expert views on the association between sexual offending and psychiatric disorders were challenged by a case–control study using 13 years' data from Swedish crime registers conducted by Fazel et al (2007). The authors compared sexual offenders with a random sample of men from the general population and reported that sexual offenders were more likely to have been hospitalized for a psychiatric condition than men in the general population (odds ratio (OR) 6.3). They also showed that sexual offenders were more likely to have a severe mental illness, including schizophrenia (OR 4.8), bipolar disorder (OR 3.4), other psychoses (OR 5.2), or an organic psychiatric condition (OR 2.4).

Fazel S, Sjostedt G, Langstrom N, et al. Severe mental illness and risk of sexual offending in men: a case-control study based on Swedish national registers. *Jurnal of Clinical Psychiatry* 2007; **68**: 588–596.

23.B. As stated in the question, research is scarce in the area of criminality in elderly people. A case–control study comparing elderly sex offenders with elderly non-sex offenders showed that the rates of psychotic illness, depressive disorders, personality disorders, and dementia did not differ significantly between the two groups. Significant differences were observed at the level of personality traits wherein sex offenders were observed to have more schizoid, obsessive-compulsive, and avoidant traits but fewer antisocial traits than non-sex offenders. Similar to any other age group of sex offenders, the elderly group consisted exclusively of males. The authors concluded that sex offending in elderly people is associated more with personality factors than with mental illness or organic brain disease.

Fazel S, Hope T, O'Donnell I and Jacoby R. Psychiatric, demographic and personality characteristics of elderly sex offenders. *Psychological Medicine* 2002; **32**: 219–226.

24.C. The data from Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) project were analysed for the effect of antipsychotics on violent behaviour in those with schizophrenia. Violence declined from 16% to 9% in those who completed the antipsychotic treatment throughout the trial period of 6 months. But no demonstrable difference was found among the different medication groups; medication adherence was associated with a reduced risk of violence only in patients with no history of childhood antisocial conduct. Hence the effect of antipsychotics on violence in schizophrenia seems to depend on the effect of the drugs on acute psychopathology. This study did not show an advantage for second-generation antipsychotics in violence risk reduction when compared with first-generation antipsychotic perphenazine.

Swanson JW, Swartz MS, Van Dorn RA, et al. Comparison of antipsychotic medication effects on reducing violence in people with schizophrenia. *British Journal of Psychiatry* 2008; **193**: 37–43.

25.B. Automatism is a psychiatric defence used in cases of homicide. Under automatism, the defence counsel argues that the accused person's behaviour at the time of the offence was 'automatic'. In other words, *mens rea* was absent and the act was merely done without the conscious force of the mind – no intention was present. Some causes of automatism include hypoglycaemia, sleep walking, epilepsy, etc. In general, the defendant is acquitted if he/she is found to have a case of sane automatism, i.e. automatisms that occur due to external causes; these are unlikely to recur, hence the acquittal. Insane automatisms are due to 'internal diseases' or disorders of the mind, which have a propensity to recur. This classification is purely legal and not based on the impulsive nature of the crime or treatability of the condition. Note that both types of automatisms, by definition, mean that there is a lack of intent (*mens rea*). Often discrete medical disorders can be classified in either type of automatism.

Murray R, Kendler K, et al., eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 558.

26.E. Morbid jealousy (also known as Othello syndrome) may be a presenting feature of schizophrenia, delusional disorder, organic brain syndromes, or affective psychosis. It is not coded separately in ICD-10 or DSM-IV but as a subtype of delusional disorder; the delusion of infidelity is described by both systems of classification. Alcohol, amphetamine, or cocaine use can give rise to delusions of jealousy that may develop into full-blown delusional disorder in vulnerable individuals.

Kingham M, Gordon H. Aspects of morbid jealousy. *Advances in Psychiatric Treatment* 2004; **10**: 207–215.

27.A. Using a broad definition of stalking the British Crime Survey (2000) estimated that 2.9% of adults aged 16–59 had been stalked in the preceding year. Women (4.0%) were more likely to be victims of stalking/harassment than men (1.7%). Risks were particularly high for young women aged between 16 and 19 (16.8%). About a third of incidents were perpetrated by someone who was in an intimate relationship with the victim at the start of the episode or in the past. A community-based epidemiological study on stalking from a medium-sized German city reported that most of the stalking victims (32%) were pursued by former intimate partners.

Budd T, Mattinson J. The extent and nature of stalking: findings from the 1998 British Crime Survey. Home Office; 2000.

Dressing H, Kuehner C, Gass P. Lifetime prevalence and impact of stalking in a European population. *British Journal of Psychiatry* 2005; **187**: 168–172.

28.B. Delusional disorder or erotomanic type has a well-known link with stalking behaviour. An often-cited descriptive study of stalking was carried out by Mullen *et al.* (1999) in a group of 145 stalkers referred to a psychiatric centre. Mullen grouped stalkers into rejected, intimacy-seeking, incompetent, resentful, and predatory types. These are arbitrary and not entirely exclusive groupings, although such typology helps in predicting the likely nature and duration of stalking and the risk of assault to a certain extent. Among these, the rejected stalkers make up the largest group, formed predominantly of ex-partners. The predatory stalkers form a small group with a high potential for sexual violence. Mullen described incompetent stalkers as 'intellectually limited and socially incompetent individuals with rudimentary courting rituals' whose victims do not reciprocate their affection. Resentful stalkers tend to frighten and distress the victim because of a sense of grievance. The intimacy-seeking stalkers form a spectrum, from those with erotomania to those with rigid infatuations. The erotomanic delusions could be both secondary to pre-existing psychotic disorders such as schizophrenia and as part of a delusional disorder.

Mullen PE, Pathé M, Purcell R, Stuart GW. Study of stalkers. *American Journal of Psychiatry* 1999; **156**: 1244–1249.

29.D. It is well established that having a convicted mother, father, brother, or sister significantly predicts juvenile delinquency in boys. Thus intergenerational continuity in offending has been noted. There is no evidence that criminal parents directly encourage their children to commit crime; in fact, most convicted men disagreed with the statement that 'I would not mind if my son/daughter committed a criminal offence'. Epidemiological studies have shown that it was extremely rare for a parent and a child to be convicted for an offence committed together. Thus, the major mediator between parental criminality and juvenile delinquency seems to be poor parental supervision, with some role for genetic transmission of antisocial behaviour.

Farrington, D.P. (1995). The development of offending and antisocial behaviour from childhood: key findings from the Cambridge Study in Delinquent Development. *Journal of Child Psychology and Psychiatry*, 36, 929–64.

30.A. Violent acts during epilepsy are extremely uncommon. But epileptic automatisms have been invoked as a defence in courts time and again. Most cases involved spontaneous, non-directed, stereotyped aggressive movements, with violence against property being more common than inflicting serious bodily injuries. Severe violence, if seen at all, is largely restricted to postictal states. When aggression presents as a feature of an epileptic seizure, it usually begins suddenly without provocation, lasts only for brief periods, and ends abruptly with evidence of impaired consciousness during the act. The act usually does not involve detailed or interactive behaviour but appears stereotyped. Episodes of postictal or ictal violence are usually associated with amnesia for the event.

Marsh L, Krauss GL. Aggression and violence in patients with epilepsy. *Epilepsy and Behavior* 2000; **1**: 160–168.

31.B. Pyromania is an extremely rare disorder that presents with repeated fire-setting. It is recognized as a category in both ICD-10 and DSM-IV, under impulse control disorders. The diagnostic criteria include tension or affective arousal before the act of setting the fire, fascination with, interest in, curiosity about, or attraction to fire and its situational contexts, as well as pleasure, gratification, or relief when setting fires or when witnessing or participating in the aftermath of a fire.

Lindberg N, Holi M, Tani P, Virkkunen M. Looking for pyromania: characteristics of a consecutive sample of Finnish male criminals with histories of recidivist fire-setting between 1973 and 1993. *BMC Psychiatry* 2005; **5**: 47.

32.C. Masochism refers to a paraphilia characterized by persistent interest in sexual activities that demean, humiliate, or cause suffering to self. Masochism requires a partner who complies by dominating and inflicting suffering. In contrast, sadism refers to a paraphilia wherein sexual arousal and gratification are obtained by inflicting pain and suffering upon the partner. Hence a sadist and a masochist can be mutual partners. Voyeurism is characterized by achieving gratification by watching people undressing or having sexual intercourse. It is the most common paraphilia reported. Fetishism refers to compulsive sexual interest in inanimate objects that are often worn by or associated with sexual partners. Hypoxyphilia (autoerotic asphyxiation) is not separately coded as a paraphilia in ICD/DSM; it refers to a specific form of masochism in which sexual arousal is attained by self-suffocation, e.g. via hanging while masturbating.

Millon T, Blaney PH, Davis RD, eds. *Oxford Textbook of Psychopathology*. Oxford University Press, 1999, p. 422.

33.E. Kleptomania is considered by some as part of the obsessive-compulsive spectrum. Extending the effectiveness of selective serotonin reuptake inhibitors (SSRI) in obsessive-compulsive spectrum disorders, several case series of successful SSRI use in kleptomania have appeared. A response rate of nearly 80% at week 7 was reported for kleptomania in an open-label trial of escitalopram; this was not maintained to the same degree in a subsequent double-blind placebo-controlled discontinuation trial. Naltrexone and mood stabilizers have also been studied in open-label trials for kleptomania, with variable benefits. To date, no strong evidence from randomized controlled trials exists to support pharmacological interventions in kleptomania.

Koran LM, Aboujaoude EN, Gamel NN. Escitalopram treatment of kleptomania: an open-label trial followed by double-blind discontinuation. *Journal of Clinical Psychiatry* 2007; **68**: 422–427.

34.A. Traditionally it was thought that 40% of those with conduct disorder experience lifetime persistence of traits that are termed as antisocial personality disorder. But this has been now challenged to be an underestimate; data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) in the USA suggests that nearly 75% of adults who were retrospectively identified to have had conduct disorder as children satisfied current criteria for antisocial personality disorder. Although this is a retrospective design, the estimates are from a more representative sample than older retrospective studies.

Gelhorn HL, Sakai JT, Price RK, Crowley TJ. DSM-IV conduct disorder criteria as predictors of antisocial personality disorder. *Comprehensive Psychiatry* 2007; **48**: 529–538.

35.C. The prevalence of schizophrenic disorders in the general population is below 1%, but patients with schizophrenia constitute between 5% and 20% of all homicide offenders. An increased risk of homicide has been associated with the first episode of psychosis. A meta-analysis of studies reporting homicide offences in psychotic patients showed that 38.5% of homicides occurred during the first episode of psychosis, prior to initial treatment. The rate ratio of homicide in the first episode of psychosis was 15.5 times the annual rate of homicide after treatment for psychosis. Nearly 40% of patients with schizophrenia who commit homicides do not have any history of psychiatric care.

Nielsen O, Large M. Rates of homicide during the first episode of psychosis and after treatment: a systematic review and meta-analysis. *Schizophrenia Bulletin* 2008; doi:10.1093/schbul/sbn144.

36.B. Shoplifting is different from kleptomania: the former is a broadly defined behaviour whereas the latter is a specific psychiatric diagnostic category. Data from a national study carried out in the USA (National Epidemiologic Survey on Alcohol and Related Conditions) have demonstrated that most individuals (nearly 90%) who admitted to at least one episode of lifetime shoplifting had a lifetime history of at least one psychiatric diagnosis, compared with nearly 50% in non-shoplifters. In both groups, the most prevalent disorders were nicotine dependence and alcohol use disorders, with nearly three or four times increased risk respectively; among shoplifters, the strongest associations were found for antisocial personality disorder and substance use disorders. Kleptomania is a rare condition and occurs in less than 5% of identified shoplifters and less than 0.6% of the general population.

Blanco C, Grant J, Petry NM, et al. Prevalence and correlates of shoplifting in the united states: results from the national epidemiologic survey on alcohol and related conditions (NESARC). *American Journal of Psychiatry* 2008; **165**: 905–913.

37.C. In *Tarasoff v The Regents of the University of California* et al., a case was brought by the parents of Tatiana Tarasoff, who had been murdered by Prosenjit Poddar. Poddar had previously disclosed his violent feelings against Tarasoff to Dr Moore, the campus psychologist. Although Dr Moore notified the police of his concerns about Poddar, the police released him after questioning. Ms Tarasoff and her family were not warned of the danger she faced. The court ruled that the clinician had a duty to protect and warn a third party from risk of harm from his/her patient, even though that third party was not under the clinician's clinical care. In the UK, a Tarasoff ruling does not apply directly; breach of confidentiality for the sake of public interest has been recognized. According to Tarasoff principles, the police and third parties must be warned of the risk as well as the wife.

Gavaghan C. A Tarasoff for Europe? A European Human Rights perspective on the duty to protect. *International Journal of Law and Psychiatry* 2007; **30**: 255–267.

38.D. Data from *Psychiatric Morbidity among Prisoners in England and Wales* 1998 showed that a large proportion of all prisoners had several mental disorders. Only 1 in 10 or fewer showed no evidence of any of the five disorders considered in the survey (personality disorder, psychosis, neurosis, alcohol misuse, and drug dependence). Thus the rate of psychiatric diagnosis was nearly 90% in prisons. Most prisoners who had a psychiatric diagnosis had more than one diagnosable condition; this was especially true if the primary diagnosis was psychotic illness. Rates for multiple disorders were higher among remand than sentenced prisoners. Despite this, most prisoners receive poor, if any, psychiatric services in prison.

Singleton N, Meltzer H, Gatward R, et al *Psychiatric Morbidity among Prisoners in England and Wales*. Stationery Office, 1998.

39.D. Homicide-suicides are mostly family affairs, especially when the perpetrator is female. Barraclough and Harris (2002) studied all murder-suicides over a 4-year period in the UK and found that 3% of male, 11% of female, and 19% of child homicides were of this type. Similarly, of all suicides, 0.8% male and 0.4% female deaths occurred as homicide-suicides. The typical cases involved families of low socioeconomic status. Death or fatal injury occurred on the same day in nearly 90% of incidents; in atypical cases the maximum interval between suicide and homicide was 10 months. In elderly people such homicide-suicide combinations are often suicide pacts complicated by depression or dementia in a couple or one of the partners. They can be considered altruistic, as often elderly people believe that the world will be better off without them.

Barraclough B, Harris EC. Suicide preceded by murder: the epidemiology of homicide. *Psychological Medicine* 2002; **32**: 577–584.

40.A. A 2-year national survey of prison suicides described the clinical and social circumstances of self-inflicted deaths among prisoners in England and Wales. Nearly one-third occurred within 7 days of arrival in prison. The commonest method (nearly 92%) was hanging or self-strangulation; nearly three-quarters had a history of mental disorder. The commonest primary diagnosis was drug dependence.

Shaw J, Baker D, Hunt IM, Moloney A, Appleby L. Suicide by prisoners: National clinical survey. *The British Journal of Psychiatry* 2004; **184**: 263–267.

41.D. Anatomical dolls are used in forensic investigation of children who are alleged victims of sexual abuse. Various procedures such as drawings, puppets, observation for sexualized behaviour, etc., have been used to obtain a child's report of sexual abuse. But research has not confirmed that responses supposedly indicative of abuse (e.g. drawing genitalia in human figure drawings, demonstrating intercourse, or oral sex between anatomical dolls, etc.) consistently occur with high frequency among abused children. Hence the use of such methods is controversial.

Dammeyer MD. The assessment of child sexual abuse allegations: using research to guide clinical decision making. *Behavioral Sciences and the Law*. 1998; **16**: 21–34.

42.B. The Remission in Schizophrenia Working Group defined remission 'as a state in which patients have experienced improvements in core signs and symptoms to the extent that any remaining symptoms are of such low intensity that they no longer interfere significantly with behaviour and are below the threshold typically utilized in justifying an initial diagnosis of schizophrenia'. Thus 'remission' is not the same as 'recovery', which is the ability to function in the community, socially and vocationally, as well as being relatively free of psychopathology. Accordingly, remission is a necessary but not sufficient step towards recovery. Note that such a scientific definition of recovery views recovery as a state of outcome; this is very different from the concept of recovery promulgated by consumer groups.

Bellack AS. Scientific and consumer models of recovery in schizophrenia: concordance, contrasts, and implications. *Schizophrenia Bulletin* 2006; **32**: 432–442.

43.D. In clinical practice, medication adherence is either assumed *de facto* or assessed from patients' self-reports. Both these measures of adherence have limited validity. Medication levels in body fluids are susceptible to manipulation. The use of electronic monitoring and a third party such as a pharmacist/clinical assistant to assess adherence may be more useful. Using the measurement of adherence as a dichotomous variable, a study comparing adherence estimates by patients, clinicians, and research assistants using electronic monitors was carried out. Compared with electronic monitoring, prescribers dramatically overestimated adherence levels. Electronic monitoring detected greater non-adherence rates (57%) than either prescribers (7%) or patients (5%), although independent third-party ratings were closer to electronic ratings (54%).

Byerly MJ, Thompson A, Carmody T, et al. Validity of electronically monitored medication adherence and conventional adherence measures in schizophrenia. *Psychiatric Services* 2007; **58**: 844–847.

44.C. Homelessness has a recognized association with severe mental illness. 'Rooflessness' refers to those living on the streets; it is difficult to include them in research surveys. Hence most researchers use a looser definition of having no fixed address and include people living in hostels and emergency accommodation. A broader term of 'housing instability' refers to the tenuousness of housing tenure. In the USA, community studies show that about a fifth of those with schizophrenia had no fixed address – a rate that was 2.4 times higher than for major depression. The European Schizophrenia Cohort (Bebbington et al., 2005) found that 32.8% of the British sample had experienced homelessness in their lifetime compared with 8.4% in Germany and 12.9% in France. The rate in London was even higher (43%).

Kooyman I, Dean K, Harvey S, Walsh E. Outcomes of public concern in schizophrenia. *The British Journal of Psychiatry* 2007; **191**: s29–36.

Bebbington P, Angermeyer M, Azorin J-M, et al. The European Schizophrenia Cohort. *Social Psychiatry and Psychiatric Epidemiology* 2005; **40**: 707–717.

45.A. Assertive community treatment (ACT) was initially developed from the 'training in community living' programme at the Mendota Mental Health Institute in Madison, Wisconsin, by Marx, Stein, and Test. According to them community rehabilitation existent in the 1970s served only to maintain patients in 'a tenuous community adjustment on the brink of rehospitalization', instead of helping patients to meet all their needs. The key principle was to provide treatment in community settings, because skills learnt in the community can be better applied in the community. In the UK it has been shown that community mental health teams are able to support people with serious mental illnesses as effectively as ACT teams, but ACT may be better at engaging clients and may lead to greater satisfaction with services (UK-700 and REACT studies; see Burns et al. for more information). A systematic review of the evidence on the ACT model has suggested that the degree of reliance on hospitalization may be the key factor in heterogeneity of outcomes seen in ACT services: the higher the reliance on hospitalization in a community, the more effective the ACT-based services are for that community. Other options in the question are false. The cost of skills training is not a major factor behind the advocacy of the ACT model.

Burns T, Catty J, Dash M, et al. Use of intensive case management to reduce time in hospital in people with severe mental illness: systematic review and meta-regression. *British Medical Journal* 2007; **335**: 336–342.

46.B. QOL is measurable using questionnaires; these measures can be subjective or objective and many standardized instruments for both are available. Most but not all QOL instruments contain 'emotional' items, mostly relating to depression and anxiety. Such scales when applied to psychiatric conditions become tautological as the content of both measures largely overlap, e.g. the Quality of Life in Depression Scale (QLDS), which is made up mainly of depressive symptoms. Subjective measures of QOL in psychiatry are particularly problematic because of 'affective, cognitive or reality distortion fallacies'. A depressed patient may underestimate his true QOL; similarly, psychopathological states may lead to distorted appraisal of one's QOL. Hence external (e.g. relatives/carers) appraisal may be necessary to complement subjective QOLs in psychiatry. Another specific type of bias noted in QOL studies in psychiatry is what is termed as 'standard drift fallacy'. Quality of life can be thought of as the gap between a person's expectations and achievements. This gap can be kept minimal (i.e. good QOL) either by living up to one's expectations or lowering these expectations. Many patients with long-term mental disorders report being 'satisfied with life' in conditions that would be regarded as inadequate or unbearable by other factions of the society. This is due to the tendency of chronic mentally ill people to lower their standards over time and thus keep the gap between expectations and achievements narrow (falsely inflated subjective QOL).

Katschnig H. Quality of life in mental disorders: challenges for research and clinical practice. *World Psychiatry* 2006; **5**: 139–145.

47.B. Different models of therapeutic communities have been tried as alternatives to hospitalization for people diagnosed with schizophrenia. Some of these models emphasized the need for individuals to experience psychosis with minimal interference and high levels of support instead of early intervention with antipsychotic medication. In the UK, initiatives such as Kingsley Hall, associated with Laing, and Villa 21, associated with David Cooper, are examples. In the USA, the 'Soteria paradigm,' was developed by Mosher and colleagues; the critical elements of Soteria are provision of a small, community-based therapeutic milieu; significant lay person staffing; preservation of personal power and social networks; sustained communal responsibilities; a 'phenomenological' relational style (giving meaning to the subjective experience of psychosis by 'being with' and 'doing with' the client); and no or low-dose antipsychotic medication administered from a position of choice and without coercion. Henderson hospital is a therapeutic community for personality disorders, not schizophrenia. The PACE (Personal Assessment and Crisis Evaluation) Clinic is a centre for people with suspected incipient psychosis in Australia where trialled interventions aimed at preventing or delaying the onset of psychotic disorders are used; these interventions include psychological and social interventions, either alone or in combination with pharmacotherapy. Partial hospitalisation refers to mentalization-based therapy for borderline personality disorder.

Calton T, Ferriter M, Huband N, Spandler H. A Systematic review of the soteria paradigm for the treatment of people diagnosed with schizophrenia. *Schizophrenia Bulletin* 2008; **34**:181–192.

Yung AR, McGorry PD, Francey SM, et al. PACE: a specialised service for young people at risk of psychotic disorders. *Medical Journal of Australia* 2007; **187**: s43–46.

48.E. According to the health belief model four main belief categories have an impact on patients' compliance with prescribed treatment. These are (1) perceived benefits, (2) perceived costs, (3) perceived susceptibility to illness and cure, (4) secondary benefits of medication and adherence. This model emphasizes the patient's decision-making process, which is composed of a subjective cost–benefit analysis in the context of the patient's personal goals and priorities. Thus any changes in levels of adherence are possible only via alteration of the patient's perceptions. The more severe the illness, the higher the likelihood of perceived benefits. Social criticism does not constitute a major factor in adherence according to the health benefits model, unless avoiding it is perceived directly as a benefit by the patient.

Patel MX, David AS. Medication adherence: predictive factors and enhancement strategies. *Psychiatry* 2004; **3**: 41–44.

49.B. Competitive employment rates are low in schizophrenia. People with mental health disorders represent the largest group (40%) who claim incapacity benefit. Various vocational programmes have been tried and tested in schizophrenia rehabilitation. Work acts as both a process and the outcome for rehabilitation in chronic schizophrenia. Sheltered employment refers to the traditional 'train and place model' where gradual stepwise skills training is initially carried out; when an individual makes sufficient progress, later placement is offered, often in sheltered workshops but not in competitive job markets. This approach remains the most widespread in Europe. Models that emphasize relatively quick placement in competitive jobs with continued support from employment specialists (supported employment models) are shown to have considerable impact compared with schemes that concentrate on social skills training or voluntary non-competitive work. This is the individual placement and support model in contrast to traditional stepwise support-till-placement (train and place approach) models. A multicentred RCT of Individual placement and training model (IPS) was carried out across six centres in Europe, including London. The results indicated that IPS was more effective than usual rehabilitation and vocational services for every work-related outcome, with 55% of patients assigned to IPS working for at least 1 day compared with 28% patients assigned to vocational services; the drop-out and readmission rates were comparatively lower in the IPS group. Local unemployment rates across the six centres accounted for a substantial amount of the heterogeneity in IPS effectiveness. Clubhouses offer an opportunity for a person with schizophrenia to resume an independent lifestyle with decent housing, facilities for education, job training, and placement via membership at a common daycentre. Token economy cannot be considered as a vocational model; it is a behavioural technique using secondary reinforcers (tokens) in rehabilitation units to enable desirable behaviour.

Burns T, Catty J, Becker T, et al. The effectiveness of supported employment for people with severe mental illness: a randomised controlled trial. *Lancet* 2007; **370**: 1146–1152.

50.A. Annual (now quarterly) labour force surveys in the UK yield the rates of employment for the mentally ill population. Patients with a significant mental illness are among the most excluded in society. It is estimated that, at best, 15% of working age people with long-term mental health problems are working, far lower than any other group of disabled people. Even when working they work fewer hours and earn only two-thirds of the national average hourly rate. The employment rates for those with less serious mental health problems are relatively better at 20–25% but still people with mental disorders constitute 39% of all claimants of Disability Allowance and 34% of Incapacity Benefit, according to Department of Works and Pensions, UK. Joblessness and lack of social networks are often exacerbated by discrimination and profound loss of social status suffered by the mentally ill. Recovery from mental illness is significantly impeded by the above.

Huxley P, Thornicroft G. Social inclusion, social quality and mental illness. *British Journal of Psychiatry* 2003; **182**: 289–290.

chapter
3

CHILD PSYCHIATRY AND LEARNING DISABILITIES

QUESTIONS

- 1. All of the following are features of Down's syndrome except**
 - A. Increased cardiac mortality and morbidity
 - B. Lax ligaments
 - C. Wide gap between first and second toes
 - D. Increased incidence of leukaemia
 - E. Delayed puberty

- 2. Which of the following is false with regard to behavioural and psychiatric disorders associated with Down's syndrome?**
 - A. Rates of non-organic psychiatric disorders are higher in Down's syndrome than in learning disability due to other causes
 - B. Autism has a significant association with Down's syndrome
 - C. Seizures are a frequent clinical feature of Alzheimer's dementia in those with Down's syndrome
 - D. Medical conditions may underlie psychiatric presentations
 - E. Most patients have a placid temperament

- 3. Classification of mental retardation into 'subcultural' and 'pathological' subtypes was first described by**
 - A. EO Lewis
 - B. Henry Maudsley
 - C. Kraepelin
 - D. Morel
 - E. Kanner

- 4. All of the following are true with regard to foetal alcohol syndrome except**
 - A. Decreased cranial size at birth
 - B. Agenesis of the corpus callosum
 - C. Neurosensory hearing loss
 - D. Poor eye-hand coordination
 - E. Congenital cataract

- 5. A subcultural rather than neuropathological explanation for learning disability is supported by which of the following?**
- A. Even distribution of learning disability across different socioeconomic groups of the population
 - B. Existence of a profound degree of learning disability
 - C. Learning disability in other members of the family
 - D. Facial dysmorphic features
 - E. Significant problems with adaptive functioning
- 6. A 6-year-old boy has autistic features, hyperactivity, and inattention. He is noted to have frequent self-injurious head banging and nail pulling. There is a history of both nocturnal and diurnal enuresis. He has an IQ in the range of moderate learning disability. He has normal uric acid levels in his serum. The most likely cause is**
- A. Trisomy 21
 - B. 7q11 deletion in the elastin gene
 - C. 17p11 microdeletion
 - D. Hypoxanthine guanine phosphoribosyltransferase deficiency
 - E. Trisomy 13
- 7. The most powerful predictor of overall functional outcome in children with autism is given by**
- A. Family history of autism
 - B. Autistic symptom count
 - C. Presence of soft neurological signs
 - D. IQ level
 - E. Non-verbal skills
- 8. Which of the following groups of school children develops a higher prevalence of psychopathology as adults than the others listed?**
- A. Victims of bullying
 - B. Perpetrators of bullying
 - C. Children who do not bully and are not victimized by others
 - D. Children who frequently bully others and get victimized by others
 - E. Children who report bullying to teachers and authorities
- 9. The most common known inherited cause of learning disability is**
- A. Down's syndrome
 - B. Fragile X syndrome
 - C. Cri du chat syndrome
 - D. Galactosaemia
 - E. Hypothyroidism

10. The point prevalence of schizophrenia in people with learning disability is

- A. 1%
- B. 20%
- C. 3%
- D. 15%
- E. 10%

11. An 18-year-old man with learning disability has ectopia lentis, fair hair, long thin limbs, and osteoporosis. The most likely diagnosis is

- A. Phenylketonuria
- B. Homocystinuria
- C. Marfan syndrome
- D. Tay Sach's disease
- E. Fragile X syndrome

12. The social approach of providing a pattern of life as ordinary as possible for the learning disabled population is called

- A. Community rehabilitation
- B. Eugenics
- C. Normalization
- D. Reality orientation
- E. Standardization

13. The proportion of the learning disabled population with an IQ in the range 50–70 is

- A. 10%
- B. 2%
- C. 4%
- D. 85%
- E. 40%

14. A landmark epidemiological study in child psychiatry is the Isle of Wight study in the UK. What was the nature of the original sample first studied?

- A. A sub-sample of all children aged 5–13
- B. Every other child aged 5–17
- C. A sub-sample of all children aged 9–15
- D. All children aged 9–11
- E. Every other child aged 9–12

15. The point prevalence of any ICD-10 disorders in 5- to 15-year-old children is estimated to be around

- A. 1%
- B. 5%
- C. 10%
- D. 20%
- E. 25%

16. Comparable male and female prevalence rates are found for which of the following psychiatric disorders in children?

- A. Eating disorders
- B. Hyperactivity disorders
- C. Nocturnal enuresis
- D. Selective mutism
- E. Tourette's syndrome

17. According to the Isle of Wight study the ratio of boys to girls with conduct disorder is

- A. 4:1
- B. 2:1
- C. 1:2
- D. 10:1
- E. Conduct disorder was not diagnosed in girls

18. Reactive attachment disorder is a recognized category in both ICD-10 and DSM-IV. Which of the following criteria used for diagnosing this condition is mentioned in DSM-IV but not ICD-10?

- A. Markedly disturbed inappropriate social relatedness
- B. The disturbance does not meet the criteria for pervasive developmental disorder
- C. Onset before 5 years of age
- D. A history of significant neglect
- E. The disturbance in relationships is a direct result of abnormal care-giving

19. The term frozen watchfulness is used in description of which of the following psychiatric conditions?

- A. Inhibited reactive attachment disorder
- B. Autism
- C. Selective mutism
- D. Social anxiety disorder
- E. Post-traumatic stress disorder

20. Which of the following best defines the diagnosis of specific reading disorder when assessed using psychometric measures of reading age?

- A. Reading age is below the 10th percentile of the peers
- B. Reading age is one standard deviation below the expected
- C. Reading age is two standard deviations below the expected
- D. Reading age is three standard deviations below the expected
- E. Reading age is below the 20th percentile of the peers

21. A 10-year-old boy makes repeated errors in reading and spelling with substitutions and omissions of letters. He is slow in reading with considerable hesitations. All of the following features are expected in this child except

- A. Minor neurological abnormalities
- B. Socially disadvantaged home setting
- C. Lower rates of conduct disorder
- D. Higher rates of similar problems in the family
- E. Higher rates of emotional problems

22. The most consistent genetic locus implicated in specific reading disorder is

- A. Chromosome 6p
- B. Chromosome 9p
- C. Chromosome 12p
- D. Chromosome 4p
- E. Chromosome 1p

23. Which of the following is a common condition in childhood that is not listed as a separate disorder in ICD-10?

- A. Sleepwalking
- B. Stuttering
- C. Tic disorder
- D. Autism
- E. Sibling rivalry

24. All of the following are recognized associations with specific reading disorder except

- A. Difficulty in visual scanning
- B. Right – left confusion
- C. Age related spontaneous resolution
- D. Higher rates in epileptic children
- E. Deterioration in acquired language skills

25. The prevalence of autism is estimated to be around

- A. 6 per 1000 children
- B. 10 per 1000 children
- C. 1 per 10000 children
- D. 1 per 1000 children
- E. 1 per 100000 children

26. Which of the following condition is associated with intractable epilepsy, autism-like features and skin lesions in children?

- A. Congenital hypothyroidism
- B. Fragile X syndrome
- C. Tuberous sclerosis
- D. Foetal alcohol syndrome
- E. Benzodiazepine use in pregnancy

- 27. During clinical assessment of temper tantrums in a child the most important initial step is to**
- A. Assess IQ of the child
 - B. Elicit family history of temper tantrums
 - C. Explore parental limit setting behaviour
 - D. Explore suicidal ideas in the child
 - E. Record family history of criminality
- 28. Controlled evaluations of family therapy in child psychiatric conditions have demonstrated significant beneficial effects for which of the following?**
- A. Anorexia nervosa in adolescents
 - B. Pervasive developmental disorder
 - C. Hyperkinetic disorder
 - D. School refusal
 - E. Specific reading disorder
- 29. Family therapy is indicated in all of the following situations in child psychiatry except**
- A. The child's symptoms are an expression of family's malfunction
 - B. Individual therapy for the child is not effective
 - C. Family difficulties are identified during the course of another therapy
 - D. The marriage of the child's parents is breaking up
 - E. Family spontaneously seeks the therapy
- 30. Which of the following scales is used as a screening instrument to identify possible developmental difficulties that need further assessment?**
- A. British ability scales
 - B. Denver screening test
 - C. Neale analysis
 - D. Stanford Binet test
 - E. Weschler scale
- 31. The prevalence of bullying is estimated to be around**
- A. 1–2% of children, at least once a week
 - B. 2–8% children, at least once a month
 - C. 2–8% children, at least once a day
 - D. 12–18% children, at least once a week
 - E. 2–8% children, at least once a week
- 32. Which of the following attachment pattern is the best predictor of future development of conduct problems?**
- A. Disorganized
 - B. Secure
 - C. Ambivalent
 - D. Resistant
 - E. None of the above

- 33. Ainsworth's strange situation procedure is usually used to study patterns of attachment in which of the following the age groups?**
- A. 30–36 months
 - B. 12–18 months
 - C. 3–6 months
 - D. 24–36 months
 - E. 18–30 months
- 34. Blood levels of which of the following substances has been adversely associated with IQ of a child?**
- A. Iron
 - B. Lead
 - C. Lithium
 - D. Magnesium
 - E. Sodium
- 35. The multiaxial system of classification for child and adolescent psychiatric disorders in ICD-10 consists of**
- A. three axes
 - B. four axes
 - C. five axes
 - D. six axes
 - E. seven axes
- 36. The average age range of attaining physical changes of puberty in boys is**
- A. 10–12 years
 - B. 11–13 years
 - C. 13–16 years
 - D. 16–19 years
 - E. 9–10 years
- 37. The proportion of children with childhood autism that show improvement by the age of 6 years is**
- A. 1–2%
 - B. 5–8%
 - C. 8–10%
 - D. 25–30%
 - E. 10–20%
- 38. In families with one autistic child, the risk of a further autistic child is about**
- A. 1–1.5%
 - B. 3–5%
 - C. 10–15%
 - D. 30–35%
 - E. 50–60%

39. The estimated heritability of attention deficit hyperactivity disorder (ADHD) is around

- A. 10%
- B. 25%
- C. 33%
- D. 50%
- E. 70%

40. All of the following factors predict poor outcome in conduct disorders except

- A. Late-onset conduct problems
- B. Multiple and varied symptoms and behaviours
- C. Parental psychiatric disorder
- D. Parental criminality
- E. Associated hyperactivity

41. Among the juvenile delinquent population, the most commonly committed offence is

- A. Sexual assault
- B. Homicide
- C. Fraud
- D. Property offences
- E. Offences related to terrorism

42. All of the following are associated with higher rates of nocturnal enuresis except

- A. Family history of enuresis
- B. Male sex
- C. Overcrowded home
- D. Rigid parental toilet training
- E. Stressful life events

43. The most common form of medically unexplained symptom complained by children is

- A. Recurrent chest pain
- B. Recurrent headaches
- C. Recurrent fever
- D. Recurrent memory loss
- E. Recurrent palpitations

44. A psychometric test involves experimental creation of a situation in which a test person has to distinguish his or her own knowledge of a hidden object from the knowledge of the others. This test is called

- A. Sally & Anne Task
- B. Draw a Person Test
- C. Thematic Apperception Test
- D. Lucy & Linda Task
- E. Rorschach's test

45. Which is the most consistently identified abnormality in neurobiological studies of autism?

- A. Elevated urinary dopamine metabolites
- B. Elevated urinary metanephhrines
- C. Raised cerebrospinal fluid (CSF) 5-HIAA
- D. Raised serotonin blood levels
- E. Low platelet MAO levels

46. Comparing autism and Asperger's syndrome, which of the following is true?

- A. Head growth deceleration is seen in autism but not Asperger's syndrome
- B. High male: female ratio is seen in Asperger's syndrome but not autism
- C. Seizures are more common in Asperger's syndrome than autism
- D. Social skills before the age of 3 is normal in Asperger's syndrome
- E. The degree of learning disability is milder in Asperger's syndrome



47. All of the following symptoms are more common in depression associated with learning disability than in those of normal intelligence except

- A. Irritability
- B. Sleep disturbances
- C. Tearfulness
- D. Decline in social skills
- E. Hypochondriasis

48. A residential care home has 12 residents with learning disability. The nurses at the care home want to use a screening instrument at regular intervals to detect likely mental health problems among the residents. Which of the following would be most suitable?

- A. Psychiatric Assessment Schedule for Adults with Developmental Disabilities
- B. Diagnostic interview schedule
- C. Camberwell Assessment of Need for Adults with Developmental and Intellectual Disabilities
- D. Schedule for Clinical Assessment in Neuropsychiatry
- E. General Health Questionnaire

49. An 8-year-old boy suffers from episodes of sudden but brief flexion of neck and trunk and flexion of legs at the hips since the age of one. He has severe mental retardation. Which of the following EEG pattern is most likely in this boy?

- A. Diffuse triphasic delta waves
- B. Flat EEG trace
- C. Background high voltage slow waves intermixed with asynchronous spikes in both hemispheres
- D. Low voltage EEG with no spikes
- E. Periodic 3/second spikes

50. Which of the following is true with respect to the use of medications to treat behavioural problems in learning disabled individuals?

- A. Antidepressants are the most effective intervention
- B. Haloperidol is the most effective intervention
- C. Low dose lorazepam has the best evidence base
- D. Placebo effect surpasses active medications
- E. Risperidone is more effective in high doses



1.E. One of the most common causes of death in Down's syndrome is congenital heart disease. Common phenotypic features seen in children with Down's syndrome include brachycephaly, broad hands, single palmar crease, epicanthal folds, clinodactyly of fifth finger, flat nasal bridge, and wide gap between first and second toes, hypotonia with lax ligaments, short stature, and mental retardation. In addition, children may have congenital heart defects such as ventricular septal defect, duodenal atresia at birth, and increased incidence of leukaemia in childhood. Atlantoaxial subluxation may occur in children with Down's syndrome, leading to spinal cord compression. The signs and symptoms of hypothyroidism can develop slowly over time and can be difficult to discriminate from those of Down's syndrome itself. No differences have been found in terms of age of onset of the physical features of puberty in adolescent girls and boys with Down's syndrome compared with general population trends. In men, reproductive capacity appears to be diminished, but women with Down's syndrome are able to bear children.

Roizen NJ and Patterson D. Down's syndrome. *Lancet* 2003; **361**: 1281–1289.

2.A. Children with Down's syndrome are known to be gentle, mild mannered, and easygoing. It is reported that emotional and behavioural problems are less frequent than other forms of learning disabilities. Medical causes must be ruled out before considering a *de novo* psychiatric explanation for behavioural and emotional problems. The dual diagnoses of Down's syndrome and autism has been recognized for some time, with recent reports quoting 7% of Down's syndrome children having autism. Puri *et al.* (2001) showed in a study of 68 adults with Down's syndrome that individuals aged over 45 with a history of seizures were significantly more likely to develop Alzheimer's dementia; nearly 84% of demented individuals with Down's syndrome developed seizures. This is far higher than the rate of seizures found in Alzheimer's dementia without Down's syndrome (10%) and Down's syndrome without dementia (8%). Early-onset seizures in Down's syndrome seem to be unrelated to Alzheimer's type of pathology.

Puri BK, Ho KW and Singh I. Age of seizure onset in adults with Down's syndrome. *International Journal of Clinical Practice* 2001; **55**: 442–444.

Gelder MG, *et al.* eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 717.

3.A. EO Lewis suggested the distinction between subcultural learning disability and biological learning disability in 1933. 'Subcultural mental handicap' refers to the lower extreme variant of IQ distribution seen in the population. The biological or pathological type is seen to be evenly distributed across all social classes, whereas the subcultural type is often seen in social class V and associated with mild rather than profound disability. Kraeplin is associated with dementia praecox, and French psychiatrist Benoit Morel is associated with the theory of degeneration in schizophrenia. Kanner is associated with infantile autism.

Blackie J, Forrest A and Witcher G. Subcultural mental handicap. *British Journal of Psychiatry* 1975; **127**: 535–539.

4.E. The diagnostic criteria for foetal alcohol syndrome includes confirmed maternal alcohol exposure in addition to evidence of characteristic facial anomalies such as short palpebral fissures and abnormalities in the premaxillary zone, including flat upper lip, cleft palate, flattened philtrum, and flat midface. Evidence of growth retardation includes low birthweight for gestational age or decelerating weight gain over time not due to undernutrition. Features suggestive of neurodevelopmental abnormalities such as decreased cranial size at birth, structural brain abnormalities (e.g. microcephaly, partial or complete agenesis of the corpus callosum, cerebellar hypoplasia), and neurological signs (impaired fine motor skills, neurosensory hearing loss, poor tandem gait, poor eye–hand coordination) are also included in the diagnostic criteria. Congenital cataract is not suggestive of foetal alcohol syndrome; in infants with cataract, other explanations for developmental problems such as toxoplasmosis, congenital rubella, or metabolic syndromes must be sought.

Autti-Ramo I. Foetal alcohol syndrome – a multifaceted condition. *Developmental Medicine and Child Neurology* 2002; **44**: 141–144.

5.C. Subcultural learning disability refers to the lower extreme variant of IQ distribution seen in the population and it often seen in social class V and associated with mild rather than profound disability. Many family members of individuals with subcultural learning disability may also have borderline IQ, probably due to the effects of shared environment and social influences. In contrast, the biological or pathological type is seen to be evenly distributed across all social classes. Dysmorphic features are more likely to be seen in those with a biological cause of learning disability with syndromic presentation being noted. Subcultural learning disability suggests the concept of a psychosocial causation (e.g. physical and emotional neglect). This is controversial.

Semple DM, et al. eds. *Oxford Handbook of Psychiatry*, 1st edn. Oxford University Press 2005, p. 687.

6.C. Smith–Magenis syndrome has a prevalence of 1: 500 000. It is caused by a microdeletion on the short arm of chromosome 17p11.2. The degree of intellectual impairment is usually variable. The phenotype includes brachydactyly, a broad, flat face, hoarse voice, and a characteristic fleshy upper lip, although these features may be very subtle. Prominent autistic features, hyperactivity (in 75%), inattention, and self-injury (in 70%) such as head banging, nail pulling, and hand biting, are seen. Nocturnal and diurnal enuresis may also be present. Sleep is characterized by reduced or absent REM phase. Trisomy 21 refers to Down's syndrome. 7q11 deletion in the elastin gene can result in Williams syndrome, which is characterized by hyperactivity, 'cocktail party speech', and supravalvular aortic stenosis. Hypoxanthine guanine phosphoribosyltransferase deficiency can result in Lesch Nyhan syndrome with severe self-mutilation, aggression, and hyperuricaemia. Trisomy 13 syndrome is also known as Patau's syndrome and can be of three types: full trisomy, mosaic pattern type, and translocation type. All survivors have profound mental retardation.

Lask B, Taylor S and Nunn K, eds. *Practical Child Psychiatry: The Clinician's Guide*. BMJ Publishing, 2003, p. 161.

7.D. Autism is a disorder with lifelong disability. About 70% of autistic individuals have an IQ in the learning disability range. In autism, IQ has been shown to be the most powerful predictor of outcome. A distinctive cognitive profile characterized by strong visuospatial skills and poor abstract ability has been noted. A small proportion of autistic children may have islets of special abilities and are dubbed as 'autistic savants'. The presence of communicative speech by the age of 5 years is another important predictor of positive outcome.

Lask B, Taylor S, Nunn K, eds. *Practical Child Psychiatry: The Clinician's Guide*. BMJ Publishing, 2003, p. 178.

Volkmar FR, Pauls D. Autism. *Lancet* 2003; **362**: 1133–1141.

8.D. In a sample of more than 2500 boys born in 1981, details of bullying and victimization were gathered when the boys were 8 years old. Between the ages of 18 and 23, information about psychiatric disorders was collected from a registry. The boys could be classified into those who bully others, those who are frequently victimized, and those who bully others and are victimized frequently. Frequent bullying-only status predicted antisocial personality and substance abuse; frequent victimization-only status predicted anxiety disorder, whereas frequent bully-victim status predicted antisocial personality and anxiety disorder. Frequent bully-victims were at particular risk of adverse long-term outcomes compared with either pure bullies or pure victims.

Sourander A, Jensen P, Ronning JA, et al. What is the early adulthood outcome of boys who bully or are bullied in childhood? The Finnish 'From a Boy to a Man' study. *Pediatrics* 2007; **120**: 397–404.

9.B. Fragile X syndrome is the most common known inherited cause of learning disability. It affects 1:3600 boys and 1:6000 girls. Thirty per cent of individuals affected by fragile X have autistic features. Nearly 20% have epilepsy too. 1 in 300 women and 1 in 800 men are carriers of fragile X mutation. Although Down's syndrome is a more common cause of learning disability, it is mostly sporadic and not inherited in the strict sense.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 714.

10.C. The point prevalence of schizophrenia is estimated to be between 3% and 4% in the learning-disabled population compared with 1% in the general population. Schizophrenia cannot be reliably diagnosed below an IQ of approximately 45. Often in clinical practice, if there is evidence of delusions or hallucinations in those with profound learning disability, a diagnosis of psychosis not otherwise specified is used. Despite this the rate of schizophrenia is significantly higher among the population with learning disability. This increase is seen despite the overall rate of psychiatric illness among adults with mild to moderate learning disability being similar to that in the general adult population without learning disability. The reason for this increased comorbidity is unclear, and common underlying brain damage that could cause both learning disability and schizophrenia cannot be ruled out.

Deb S, Thomas M and Bright C. Mental disorder in adults with intellectual disability. 1. Prevalence of functional psychiatric illness among a community-based population aged between 16 and 64 years. *Journal of Intellectual Disability Research* 2001; **45**: 495–505.

11.B. Homocystinuria is a metabolic disorder characterized by an increased blood and urine concentration of amino acid homocysteine. Clinical features resemble Marfan syndrome; patients have ectopia lentis, chest and spinal deformities similar to Marfan syndrome. But changes in hair colour, osteoporosis, arterial and venous thrombosis, and learning disabilities are generally absent in patients with Marfan syndrome.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 715.

12.C. In the past, learning disability has been a cause for social rejection, with prejudiced labels such as 'degeneracy' associated with it. The so-called degenerates were isolated from the community, leading to the establishment of large mental institutions. The principle of normalization is seen by many as a reaction to the dehumanizing policies of the past. Normalization promotes independence and autonomy while making it possible for people with learning disabilities to have an ordinary life with the same choices and opportunities as everyone else. This shifts the focus from 'disability' to 'differences in ability'.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry* 5th edn. Oxford University Press, 2006, p. 722.

13.D. Nearly 85% of those with learning disability have an IQ in the range 50–70 (mild learning disability). Of the rest, nearly 10% have moderate learning disability with an IQ in the range 35–50 and around 5% have an IQ in the severe/profound learning disability range (less than 35).
Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 708.

14.D. Major epidemiological work in child psychiatry started with the Isle of Wight surveys between 1964 and 1974. The Isle of Wight surveys had a two-phase design, with a systematic questionnaire screening a large sample, followed by in-depth assessments of a sub-sample selected according to the results of screening. Multiple informants were used in both phases. All 9- to 11-year-old children attending state schools on the island were included in the primary survey. A 4-year follow-up was carried out for children identified with psychiatric problems when they were approximately 14 years old.

Rutter M. Isle of Wight revisited: twenty-five years of child psychiatric epidemiology. *Journal of the American Academy of Child and Adolescent Psychiatry* 1989; **28**: 633–653.

15.C. Numerous cross-sectional epidemiological surveys have confirmed that psychopathology in young people is common, with most studies estimating the prevalence to be between 10% and 20%. In a study that included more than 10 000 children, overall rates of psychiatric disorders in 5- to 15-year-old children in UK was estimated to be around 9.5%. A review of 49 surveys worldwide indicated an average point prevalence of 12.9% for psychiatric disorders in children. Emotional disturbances and behavioural disorders are equally common. Only a small proportion – between 10% and 30% – of children with a psychiatric disorder make contact with specialist mental health services.

Martin A, Volkmar FR, eds. *Lewis's Child and Adolescent Psychiatry: A Comprehensive Textbook*, 4th edn. Lippincott Williams and Wilkins, 2007, p.164.

16.D. Pervasive developmental disorders such as autism and Asperger's syndrome are more common in boys. Attention deficit hyperactivity disorder, tic disorders, oppositional defiance, and conduct disorders are also seen more often in boys than in girls. The rate of depression seems equal between both sexes before puberty. School refusal and selective mutism are also equally common in both boys and girls. Depression after puberty, specific phobia, eating disorders, and enuresis in daytime are more common in girls. Nocturnal enuresis in older children is more prevalent in boys.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 651 (see Table 24.2).

17.A. Conduct disorders are four times more common in boys than in girls according to the Isle of Wight study. Girls are more prone to use verbal and relational violence, such as exclusion from groups and character defamation, than the physical attacks seen in boys. Consequently, girls are violent in a way that can be difficult to document and to describe as conduct disorder symptoms; this may be a reason for under-diagnosis of conduct issues in girls.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 650.

18.E. The core features of reactive attachment disorder (RAD) are preserved across both diagnostic nosologies, ICD and DSM. But the focus on subtypes and emphasis on the pathogenic nature of care giving are different. The DSM-IV includes inhibited and disinhibited types of RAD. In ICD-10, the term reactive attachment disorder stands for inhibited type, while disinhibited attachment disorder is separately defined. Both ICD and DSM endorse problems of social relatedness in RAD. Age of onset criteria (before 5 years) and exclusion of pervasive developmental disorders are common for both nosologies. In addition, DSM-IV also requires the presence of a known history of grossly pathogenic care, suggesting a causal link. Children with the disinhibited subtype may appear indiscriminately social.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 667.

19.A. The term 'frozen watchfulness' describes an alertness or even hypervigilance that is maintained despite an overall inhibition of motor activity that may include mutism. Reactive attachment disorder (RAD) is associated with markedly disturbed and developmentally inappropriate social relatedness beginning before age 5 years. It commonly presents as persistent failure to initiate or respond to most social interactions. The responses can be excessively inhibited, hypervigilant, or highly ambivalent and contradictory. This is associated with avoidance of resistance to comforting or exhibiting a frozen watchfulness. This type of RAD is called the inhibited type. In disinhibited type, diffuse attachments manifested by indiscriminate sociability with marked inability to exhibit appropriately selective attachments are seen. This frozen watchfulness is different from aloofness seen in autism or dissociative features seen in PTSD. Frozen watchfulness is also seen in young victims of physical abuse.

Hornor G. Reactive Attachment Disorder. *Journal of Pediatric Health Care* 2008; **22**: 234–239.

20.C. According to current classificatory systems, a learning disorder such as specific reading disorder can be diagnosed when the child achieves substantially lower than expected scores on individually administered, standardized tests of components of learning (reading, mathematics, or written expression) for a given age, schooling, and level of intelligence. Thus an explicit reference to psychometric assessments is made when diagnosing learning disorders. But a specific guideline as to the statistical meaning of being substantially below the expected norm is not clearly delineated in DSM IV. Nevertheless, ICD-10 states a score that is at least 2 standard errors of prediction below the expected value as diagnostic criteria for specific developmental disorders of scholastic skills.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 667.

21.C. This child is most likely having specific reading disorder. This is associated with higher prevalence of emotional disturbances and conduct disorder. It is more often seen in boys than girls. Minor soft neurological signs are frequently seen in children with this disorder, suggesting a neural developmental abnormality.

Martin A and Volkmar FR, eds. *Lewis's Child and Adolescent Psychiatry: A Comprehensive Textbook*, 4th edn. Lippincott Williams and Wilkins, 2007, p.413.

22.A. Specific reading disorder is regarded to have significant genetic aetiology, with multiple genes contribute to the biological risk factor. The candidate regions are abbreviated as DYX1 to DYX9 on chromosomes 15q, 6p, 2p, 6q, 3cen, 18p, 11p, 1p, and Xq, respectively. Of these, the most consistent findings seem to be the role of chromosome 6.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 668.

23.B. Among the specific disorders of psychological development listed in the question, stuttering is not a separate diagnostic category in the current ICD-10, Chapter V. Stuttering has a high incidence between second and fourth years of life affecting 4% to 5% of the population with nearly equal sex ratio at the start. Normal developmental dysfluencies tend to occur in the larger linguistic units such as words, phrases, and sentences. In stutterers this occurs in repetitions of syllables and prolongation of sounds. Recovery usually occurs by adolescence and is more likely in girls; nearly 1 in 30 children have stuttering though only 1% of adolescents show stuttering. A familial component is noted in stuttering - the risk in first-degree relatives being more than three times the population risk.

Sleepwalking, sibling rivalry disorder, tic disorder and autism are definite diagnostic categories in ICD-10.

Martin A and Volkmar FR, eds. *Lewis's Child and Adolescent Psychiatry: A Comprehensive Textbook*, 4th edn. Lippincott Williams and Wilkins, 2007, p. 424.

24.E. Deterioration of already acquired language skills is not seen in specific reading disorder or dyslexia. Neurodevelopmental basis for dyslexia is suggested by the similarity of certain symptoms in dyslexic children and the neurological syndrome of 'visual word blindness' that results from damage to the left inferior parieto-occipital region (more specifically, the left angular gyrus). This region is speculated to have a role in processing the optic images of letters; damage to this region may lead to defects in visual scanning. It is also noted that dyslexic children have poor or delayed brain lateralization, especially for language. The high incidence of left-handers, right-left confusion and the mirror-writing phenomenon noted in dyslexia can be considered as indirect support to this notion. Epileptic children may have higher incidence of dyslexia. General improvement with age suggests a brain maturational delay in the aetiology of dyslexia.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 669.

Habib M. The neurological basis of developmental dyslexia: an overview and working hypothesis. *Brain* 2000; **123**: 2373–2399.

25.D. Preliminary surveys regarding epidemiology of autism reported 2–5 cases of autism per 10 000 children. Wide variations have been reported in later studies ranging from 0·7 to 21 per 10 000 children (median 4–5 per 10 000). At present, at least one in 1000 children are estimated to have autism. Differences in methodology of surveys and wide variations in the definition of autism are the main reasons behind such variations. It is noted that boys have three-to-four-fold higher rates of autism.

Volkmar FR and Pauls D. Autism. *Lancet* 2003; **362**: 1133–1141.

26.C. Tuberous sclerosis is an autosomal dominant genetic multisystem disorder characterised by widespread hamartomas in the brain, heart, skin, eyes, kidney, lung, and liver. Most features of tuberous sclerosis become evident only in childhood after 3 years of age. The affected genes *TSC1* and *TSC2* encode for proteins hamartin and tuberin respectively. Epilepsy is seen in 60–80% tuberous sclerosis cases and is thought to be secondary to changes of GABA receptors in dysplastic neurons, and enhanced excitation via glutamate receptors in cortical hamartomas. The epilepsy is generally of an early onset and is often intractable in severity. Hypomelanotic macules are the most common dermatological manifestation; they are seen in 90–98% of patients with tuberous sclerosis.

Curatolo P, Bombardieri R and Jozwiak S. Tuberous sclerosis. *Lancet*; **372**: 657–668.

27.C. Temper tantrums are common in children between the ages of 18 months and 4 years. Tantrum behaviours range from simple crying to dramatic attention-seeking events such as breath holding and head banging in otherwise normal children. Often parents may be reinforcing tantrum behaviour without knowledge and may have an inconsistent approach to discipline and limit setting. Hence the first step in assessment of a family with a child throwing frequent temper tantrums is discovering why parents are not able to set consistent limits.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 666.

28.A. The strongest evidence base for using family therapy exists for anorexia nervosa in adolescents. By the end of family therapy sessions more than 50% adolescent girls reach a healthy weight; it is estimated that more than 60% achieve recovery on follow up. Encouraging parents to take an active role is seen as a vital component; not involving the parents in the treatment leads to the worst outcome and may delay recovery considerably. Other conditions with evidence base for the use of systemic family therapy include childhood mood disorders, substance abuse and conduct problems in children.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 663.

Asen E. Outcome research in family therapy. *Advances in Psychiatric Treatment* 2002; 8: 230–238.

29.D. Family therapy considers the symptoms in a child to be expression of family dysfunction. It can be used if such dysfunctions are evident during assessment, or if individual therapy fails or to manage family difficulties arising in the course of other treatments. As in other forms of psychotherapy, no blanket indications and contraindications can be listed for family therapy. But there are some instances in which therapists do not advise the family to undergo therapy. In families where parental marital relationship is breaking down, highly fixed psychopathology that blocks any communication in family sessions and extreme schizoid or paranoid pathology are some of the instances where family therapy does not come as first choice of psychotherapy.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 663.

30.B. Denver developmental screening test can be applied from birth to 6 ½ years to identify delays in personal, language, motor and social development in children. It is purely a screening tool and any children identified to have developmental delays should undergo further assessment. Neale analysis of reading is a specific test of educational attainment (reading accuracy and comprehension). Stanford Binet test measures IQ using norms starting from age 2 to adulthood. Wechsler intelligence scale for children tests IQ for children between ages 6 – 14 years. A preschool and primary school version to test children aged 3 – 7 is also available. British ability scales are tests of intelligence covering varied areas such as speed of processing, spatial imagery, short term memory, perceptual matching and application of knowledge.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 659.

31.E. A large survey in United Kingdom reported that 10% of pupils at a secondary school had been bullied during one term, with 2–8% (average 4%) reporting being bullied at least once a week. The commonest type of bullying is general name calling, followed by being hit, threatened, or having rumours spread about one. Bullying is more prevalent among boys; 30% of children do not tell anyone that they are bullied. This percentage is higher for boys and older children.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 656.

http://www.nspcc.org.uk/Inform/resourcesforprofessionals/Statistics/KeyCPStats/10_wda48744.html (Accessed 14 March 2009).

32.A. Various aetiological contributors for conduct disorders include family stressors, parental discipline, child characteristics such as temperament or neurobiological problems and attachment relationships. Attachment behaviours include those infant behaviours that are activated by stress and that have as a goal the reduction of arousal and reinstatement of a sense of security. Such reinstatement is usually best achieved in infancy by close physical contact with a familiar caregiver. In addition to Ainsworth's initial description of secure, ambivalent and avoidant attachment patterns, Main and Solomon described a fourth infant attachment category called disorganized type. As many as 10 - 15% of children in some samples show disorganized type of attachment. Such disorganized attachment pattern presents with high levels of aggression, more externalizing and controlling behaviour in middle childhood. This is strongly related to aggressive disorders such as conduct disorder in childhood.

Lyons-Ruth K. Attachment relationships among children with aggressive behavior problems: the role of disorganized early attachment patterns. *Journal of Consulting and Clinical Psychology* 1996; **64**: 64–73.

33.B. Strange Situations procedure was initially employed by Mary Ainsworth to study attachment behaviours in children between ages 12 to 18 months. The experiment takes place in a room with a one-way mirror and attractive toys. The expected behaviour includes running around, clinging and reunion; so the children need to be somewhat mobile between ages 12 and 18 months.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 656.

34.B. Lead is established to have neurotoxic effects on growing brain; blood lead concentrations above 10 µg per decilitre (0.483 µmol per litre) are associated with adverse intellectual functioning and social-behavioural conduct. A blood lead concentration of 10 µg per decilitre or higher is designated as a 'level of concern' by the World Health Organization. It is estimated that a loss of 7.4 IQ points takes place with a lifetime average blood lead concentration of up to 10 µg per decilitre.

Canfield RL, Henderson CR Jr, Cory-Slechta DA, et al. Intellectual Impairment in Children with Blood Lead Concentrations below 10 µg per decilitre. *New England Journal of Medicine* 2003; **348**: 1517–1526.

35.D. Multiaxial classification is very useful for child and adolescent psychiatric disorders due to the inherent complexity of information required in diagnosis and treatment. In the absence of a multiaxial system, certain conditions may easily get overlooked, such as the developmental learning disorders in a child with conduct problems. But the placement of certain disorders within a multiaxial framework may be problematic especially when the disorders have no specific aetiology and spans across multiple axes used in the classification. ICD-10 recommends six axes for diagnosing mental health problems in children. These include (1) psychiatric syndromes; (2) disorders of psychological development; (3) intellectual level; (4) medical conditions; (5) abnormal psychosocial situations; (6) global assessment of functioning. In contrast DSM-IV has five axes in total, as psychiatric symptoms and developmental disorders come under axis 1.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 649.

36.C. The average age at which physical changes of puberty occur is different for boys and girls. Tanner staging is often used to assess physical changes in puberty and stage 2 genital changes are used to define onset of puberty. It varies between 11 and 13 in girls, and 13 and 17 in boys. It must be noted that the criteria that more accurately reflect gonadal activity are breast development in girls and genital growth in boys. As these are difficult to ascertain, reliable measurement is not possible using observations of physical maturity; puberty as assessed by hormonal measurements of the hypothalamic pituitary gonadal axis is well established before physical signs appear.

Reiter EO. Have the onset and tempo of puberty changed? *Archives of Paediatric and Adolescent Medicine* 2001; **155**: 988–989.

37.E. By the age of 6 years, 10–20% of individuals with autism begin to improve. Eventually 15% of individuals achieve satisfactory self-sufficiency while another 20% manage with minimal periodic support. The remainder of at least 60% individuals does not achieve sufficient self sufficiency for an independent life. This outcome is variable according to degree of communicative language developed and IQ.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 674.

38.B. In families with one autistic child the risk of a further autistic child is around 3 – 5%. This sibling risk rate for autism denotes a tenfold increase over general population rates. Epidemiological studies of same sex autistic twins have identified around 60% monozygotic concordance while 0% for dizygotic twins. This difference becomes further pronounced when a broader autistic phenotype of related cognitive or social abnormalities are considered (92% of MZ pairs vs. 10% of DZ pairs). The risk to a monozygotic co-twin is estimated to be over 200 times the general population rate.

Baron-Cohen S. The cognitive neuroscience of autism. *Journal of Neurology, Neurosurgery, and Psychiatry* 2004; **75**: 945–948.

39.E. The heritability of ADHD is estimated to be around 70%. Twin studies performed in several countries have shown that the average genetic contribution is 70–80% while non genetic variance contributes to 20–30%. It is also observed that 6% of adoptive parents of ADHD probands have ADHD compared to 18% of the biological parents of ADHD probands and 3% of the biological parents of the control probands. Siblings of children with hyperkinetic disorder have a 2–3 times greater risk of the disorder than siblings of normal controls.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 677.

Wallis D, Russell HF, and Muenke M. Genetics of attention deficit/hyperactivity disorder. *Journal of Pediatric Psychology* 2008; **33**: 1085–1099.

40.A. Childhood conduct disorder can continue as adult antisocial personality disorder. A wide range of other psychiatric disorders including substance abuse, major depression, psychosis and various adverse outcomes such as suicide, delinquency, educational difficulties and unemployment have been associated with conduct disorder. Evidence on prognosis of conduct disorder suggests dose-response relationship: The higher the number and variety of disruptive behaviours, the worse the adult outcomes. But most adolescents with conduct disorder do not develop antisocial personality in adulthood. Those who do not develop adverse outcomes as adults are most likely to have a late onset, adolescent-limited disorder rather than a life-course persistent problem with early onset. Other poor prognostic factors include severity, comorbid hyperactivity, pervasive behavioural disruption across varied settings and continuous exposure to risk factors.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 679.

Martin A and Volkmar FR, eds. *Lewis's Child and Adolescent Psychiatry: A Comprehensive Textbook*, 4th edn. Lippincott Williams and Wilkins, 2007, p. 457.

41.D. Among juvenile delinquents, the most common offences are against property. Boys are more delinquent than girls in a ratio of 4 to 11 delinquent boys for every delinquent girl. Among boys who get convicted only half get reconvicted. But most (nearly 75%) with repeated convictions become adult offenders.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 680.

42.D. Most enuretic children are free from psychiatric disorders. But the rate of psychiatric disorders is higher in enuretic than non-enuretic children. Children growing up in large families in overcrowded conditions have higher rate of enuresis. Stressful life events may form a starting point of secondary enuresis in children. Toilet training methods used by parents have not shown to be associated with enuresis. Enuresis tends to run in families; a positive family history can be related to positive treatment outcome. Many chromosomal loci have been identified - 13q, 12q, 8, and 22. Rarely some families show an autosomal dominant mode of transmission with penetrance above 90%.

Martin A and Volkmar FR, eds. *Lewis's Child and Adolescent Psychiatry: A Comprehensive Textbook*, 4th edn. Lippincott Williams and Wilkins, 2007, p.658.

43.B. Recurrent headaches are the most common somatic symptom with no medical explanation complained by children, followed by abdominal pain. 10 to 30% of children admit having frequent headaches (at least weekly) while 7 to 25% admit having abdominal pain. Chest pain is reported by approximately 10% of school aged children. At least 7.5% of children admit to other musculoskeletal pains. Chronic fatigue syndrome appears to be uncommon in children with estimated prevalence less than 1%.

Martin A, Volkmar FR, eds. *Lewis's Child and Adolescent Psychiatry: A Comprehensive Textbook*, 4th edn. Lippincott Williams and Wilkins, 2007, p. 636.

44.A. The Sally and Anne Task involves metarepresentation of another person's mental state. Two test characters Sally and Anne are shown in a picture. Sally leaves a toy at a place. Anne hides the toy at a different place in the absence of Sally. When Sally returns, where will she look for the toy - the place it was before she left the scene or the place where it had been moved by Anne? This requires a subject to distinguish his or her own knowledge that an object has been hidden by Anne in the absence of Sally from the knowledge of Sally. The test subject must be able to reflect Sally's mental state i.e. 'I know that she does not know where the object really is'. The Sally and Anne Test therefore tests understanding a first order false belief. As theory of mind does not develop fully before age 4, children under this age very often fail the test.

Brune M. 'Theory of Mind' in schizophrenia: a review of the literature. *Schizophrenia Bulletin* 2005; **31**: 21–42.

45.D. One of the most consistently observed biological findings in autism is increased serotonin levels in the blood, which is noted in 30–50% of children with autism. The high whole blood serotonin is also noted among family members of autistic patients. Essentially this whole blood level reflects platelet serotonin.

Connors SL, Matteson KJ, Sega GA, et al. Plasma serotonin in autism. *Pediatric Neurology* 2006; **35**: 182–186.

46.E. In both autism and Asperger's syndrome, males outnumber females. Communications skills are generally poor in autism, but fairly developed in Asperger's patients. Circumscribed narrow interests are usually severe in Asperger's syndrome. Seizures are uncommon in Asperger's patients while it is commoner in autism. Social skills are poorly developed in both autism and Asperger's disorder. IQ ranges from mild learning disability to normal level in Asperger's syndrome, while most patients with autism have low IQ. Head growth deceleration is not seen in both autism and Asperger's syndrome; it is a feature of Rett's disorder.

Volkmar FR and Pauls D. Autism. *Lancet* 2003; **362**: 1133–1141.

47.E. Though most symptoms of depression seen in learning disabled individuals are same as those seen in general population, certain differences exist. Cognitive syndrome of depression including memory disturbance and loss of concentration are often not detected. Similarly, guilt and recurrent thoughts of suicide are under-reported. But biological changes associated with depression such as psychomotor retardation, disturbed sleep, appetite and weight loss and diurnal variation in symptoms are more readily detected. Some symptoms may be more marked in depressed individuals with severe learning disability e.g. psychomotor agitation, irritability and behavioural disturbance. Decline in established activities of daily living and tearfulness may be signs of hidden depression in some patients. Hypochondriasis and other formed beliefs are rarely seen.

Prasher V. Presentation and management of depression in people with learning disability. *Advances in Psychiatric Treatment* 1999; **5**: 447–454.

48.A. Measurement of psychopathology in people with learning disabilities is difficult. This issue is partly addressed by the Psychiatric Assessment Schedule for Adults with Developmental Disabilities (PAS–ADD) interview. A shorter version is also available and can be used as a screening tool by untrained people to identify clients with learning disabilities at risk of developing a psychiatric disorder. It contains 29 items concerning symptoms of psychiatric disorders, split into five scales that combine to produce three total scores: 1, affective/neurotic disorder; 2, possible organic disorder; and 3, psychotic disorder. Scores equal to or above specified thresholds indicate if a further assessment is necessary.

Sturmey P, Newton JT, Cowley A, et al. The PAS-ADD checklist: independent replication of its psychometric properties in a community sample. *British Journal of Psychiatry* 2005; **186**: 319–323.

49.C. This child is most likely to have infantile spasms. This condition appears usually at the ages of 4 to 6 months. The spasms are a form of epilepsy and are characterised by sudden, brief flexion of neck and trunk, raising both arms forwards or and flexion of legs at the hips. A cry may be associated with the attack. The EEG is generally chaotic with slow waves of high voltage intermixed with asynchronous spikes in both hemispheres. This pattern of EEG findings is called hypsarrhythmia. Patients with infantile spasms limited to one side may have a surgically removable cortical dysplasia. Infantile spasms are also noted in infants with Down syndrome or tuberous sclerosis. The term West syndrome is applied to the triad of infantile spasms, hypsarrhythmia, and mental retardation.

Gelder MG, et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press 2000, pp. 1980–1981.

50.D. Despite widespread use of antipsychotics to treat challenging behaviour in learning disabled adults, the evidence is scarce. ‘Neuroleptics for Aggressive Challenging Behaviour in Intellectual Disability’ (NACHBID) was a multicentre study that compared first-generation and second-generation antipsychotic drugs with placebo in patients with aggressive challenging behaviour. A reduction in aggression was noted with both antipsychotic treatments and placebo use after 4 weeks; the greatest response was with placebo. No differences between groups were observed in terms of aberrant behaviour, quality of life, general improvement or effect on carers. The combination of placebo effect, the psychological effect of a formal external intervention and/or spontaneous resolution surpasses than the effect of medications.

Tyler P, Oliver-Africano PC, Ahmed Z, et al. Risperidone haloperidol and placebo in the treatment of aggressive challenging behaviour in patients with intellectual disability: a randomised controlled trial. *Lancet* 2008; **371**: 57–63.

chapter
4

OLD AGE PSYCHIATRY

QUESTIONS

- 1. After a specific number of subcultivations in the laboratory, normal human cells undergo irreversible cessation of mitosis and enter a non-dividing state. This phenomenon is known as**
 - A. Programmed cell death
 - B. Hayflick phenomenon
 - C. Pruning
 - D. G₀ phase arrest
 - E. Cellular atrophy

- 2. The Hachinski Ischaemic Score is used to aid clinical differentiation of Alzheimer's dementia from vascular dementia. Which of the following clinical features support a diagnosis of Alzheimer's dementia rather than vascular dementia?**
 - A. Stepwise progression
 - B. Fluctuating course
 - C. Abrupt onset
 - D. Early change in personality
 - E. Nocturnal confusion

- 3. Which of the following statement regarding the assessment of activities of daily living (ADL) in elderly people is correct?**
 - A. ADL scales are used as outcome measures
 - B. The Barthel index is a self-rating scale
 - C. In dementia basic ADL are affected earlier than complex instrumental ADL
 - D. None of the validated ADL scales depend on the patient's self-report
 - E. The choice of ADL scale in a patient depends on the patient's gender

- 4. Schizophrenia-like psychosis is a prominent feature of which of the following dementing illnesses?**
 - A. Pick's disease
 - B. Creutzfeldt-Jakob disease (CJD)
 - C. Vascular dementia
 - D. Huntington's dementia
 - E. Lewy body dementia

5. A 78-year-old man is treated with diazepam by his general practitioner for disabling anxiety related to a recent bereavement. The half-life of diazepam is most likely to be increased in this man due to
- Increase in intestinal absorption
 - Increase in oral bioavailability
 - Increase in plasma protein binding
 - Increase in volume of distribution
 - Decrease in renal elimination
6. Which of the following scales can be used to record the behavioural and psychological features associated with dementia in elderly people?
- Neuropsychiatric inventory
 - Schedule for clinical assessment in neuropsychiatry
 - Bristol scale
 - Cornell scale
 - Abbreviated mental test
7. Which of the following diagnostic tests has been most widely used to monitor treatment response in anticholinesterase trials for dementia?
- Behaviour Pathology in Alzheimer's Disease rating scale
 - Clock drawing test
 - Alzheimer's disease assessment scale – cognitive section (ADAS-Cog)
 - Mini Mental State Examination (MMSE)
 - Magnetic resonance imaging (MRI) brain scan
8. The average annual decline on the MMSE scores for patients with a natural course of Alzheimer's dementia is
- 1–2 points/year
 - 3–4 points/year
 - 5–6 points/year
 - 7–9 points/year
 - 9–11 points/year
9. Hyponatraemia is a troublesome side-effect of treating depression in elderly people. All of the following are true with regard to the above except
- More common in males
 - More frequent when diuretics are co-prescribed
 - Often related to inappropriate ADH secretion
 - Risk increases with increase in age
 - Symptoms overlap with primary depressive features

- 10. Presenilin mutations that are associated with early-onset Alzheimer's dementia are proposed to affect which of the following enzymes?**
- A. κ Secretase
 - B. Tau phosphorylation enzymes
 - C. α Secretase
 - D. β Secretase
 - E. γ Secretase
- 11. Which of the following is an observational tool designed to evaluate the quality of care and well-being of people with dementia in formal care settings?**
- A. Bristol Scale
 - B. Burden Interview
 - C. Caregiver Burden Scale
 - D. Clinical Dementia Rating (CDR)
 - E. Dementia Care Mapping (DCM)
- 12. A 67-year-old retired educational psychologist presents with forgetfulness. All of the following are features seen in mild cognitive impairment (MCI) except**
- A. Presence of subjective memory complaint
 - B. Objective memory impairment for age
 - C. Preserved general cognitive function
 - D. Normal functional activities
 - E. Presence of family history of dementia
- 13. Lund–Manchester criteria are used in the diagnosis of which of the following conditions?**
- A. Alzheimer's dementia
 - B. Vascular dementia
 - C. Lewy body dementia
 - D. Frontotemporal dementia
 - E. Huntington's dementia
- 14. All of the following are features of visual hallucinations reported in dementia of Lewy bodies except**
- A. The images are vivid
 - B. The images are mostly grey or black and white
 - C. Animate objects are often seen
 - D. The images are usually three dimensional
 - E. They predict better response to cholinesterase inhibitors

- 15. Two patients are admitted to an inpatient unit for elderly people with movement disturbances. Patient A has a diagnosis of Parkinson's disease while patient B is diagnosed with dementia with Lewy bodies. Which of the following is correct with regard to the extrapyramidal symptoms in these conditions?**
- A. Patient A is more likely to have greater postural instability than patient B
 - B. Patient A is more likely to have greater facial impassivity than patient B
 - C. Patient A is more likely to have tremors than patient B
 - D. Both patients will have similar profiles of extrapyramidal features
 - E. Patient B is more likely to have prominent cerebellar signs
- 16. Which of the following is associated with poor antidepressant response in geriatric depression?**
- A. Earlier age of onset
 - B. Structural white matter abnormalities
 - C. Enlarged cerebral ventricles
 - D. Cingulate hyper-metabolism during depression
 - E. Presence of somatic symptoms
- 17. Which of the following present at the time of onset of depression predict greater risk of depressive relapse after treatment discontinuation in elderly patients with depression?**
- A. Depressive cognitions
 - B. Presence of guilt
 - C. Executive dysfunction
 - D. Episodic memory loss
 - E. Psychomotor retardation
- 18. Secondary depression may be caused by physical illnesses in elderly people. Which of the following is correct with regard to depression and physical illness?**
- A. Primary depression is not diagnosed in the presence of chronic medical illnesses in elderly people
 - B. Secondary depression is more common than primary depression in elderly people
 - C. Subclinical hypothyroidism is more common among depressed than non-depressed elderly people
 - D. Depression is two to three times more common in those with chronic medical illnesses
 - E. Many apparent physical illnesses are found on investigation to be due to somatoform disorders

19. Psychosis in elderly people may be due to dementia, Parkinson's disease, or schizophrenia. Which of the following is correct with respect to the clinical features of late-onset psychotic syndromes?

- A. Hallucinations are more common than delusions in psychosis due to Alzheimer's disease
- B. Visual hallucination is the most common symptom in very late-onset schizophrenia
- C. Partition delusions are characteristic of psychosis associated with parkinsonism
- D. Negative symptoms are predominant in very late-onset schizophrenia
- E. Paranoid delusions are the most common symptoms in late-onset schizophrenia

20. Which of the following forms of grief therapy treats unresolved grief as a form of phobic avoidance?

- A. Guided mourning
- B. Supportive grief counselling
- C. Focused group therapy
- D. Interpersonal psychotherapy
- E. Debriefing

21. When compared with those with late-onset depression, elderly individuals with early-onset depression have

- A. Less frequent family history of mood disorders
- B. Higher prevalence of dementia
- C. More sensory impairment
- D. Greater enlargement of the lateral ventricles of the brain
- E. Less white matter hyperintensities

22. The most effective psychological intervention to reduce depression and emotional burden in caregivers of people with dementia is

- A. Psychoeducational intervention
- B. Group behavioural management
- C. Individual behavioural management
- D. Supportive psychotherapy
- E. Coping skills enhancement

23. Which of the following methods of psychological management of neuropsychiatric symptoms of dementia uses materials such as old newspapers and household items to stimulate memories and enable people to share and value their experiences?

- A. Reminiscence therapy
- B. Validation therapy
- C. Reality orientation therapy
- D. Cognitive stimulation therapy
- E. Snoezelen therapy

- 24. A 72-year-old man presents with paranoid delusions and ideas of reference. The most common cause of new onset psychotic symptoms in this age group is**
- A. Parkinson-related psychosis
 - B. Very late-onset schizophrenia
 - C. Drug-induced psychosis
 - D. Alzheimer's dementia
 - E. Lewy body dementia
- 25. According to the stage theory of grief, the earliest response after a natural death of a family member is**
- A. Numbness and disbelief
 - B. Yearning and anxiety
 - C. Anger
 - D. Depressed mood
 - F. Acceptance of the loss
- 26. Memory complaints that do not qualify for a diagnosis of dementia are common in elderly people. All of the following are shown to predict conversion from mild cognitive impairment (MCI) to dementia except**
- A. Hippocampal atrophy
 - B. Family history of Alzheimer's dementia (AD)
 - C. Carers' reports of impaired daily function
 - D. Significantly poor cognitive abilities
 - E. Presence of sensory impairment
- 27. The annual rate of progression from mild cognitive impairment (MCI) to dementia is estimated to be around**
- A. 10–15%
 - B. 20–25%
 - C. 30–35%
 - D. 1–2%
 - E. 4–5%
- 28. Median survival from the time of diagnosis for patients with Alzheimer's dementia (AD) is**
- A. 1–3 years
 - B. 3–5 years
 - C. 5–8 years
 - D. 10–12 years
 - E. 15–18 years

- 29. Braak stages are used in neuropathological quantification of brain changes in Alzheimer's disease. Which of the following is the basis of Braak's stages?**
- A. Senile plaques
 - B. Neuritic plaques
 - C. Cortical atrophy
 - D. Neurofibrillary tangles
 - E. Hippocampal volume
- 30. Many subtypes of vascular dementia have been identified. Which of the following refers to Binswanger's disease?**
- A. Attenuation of subcortical white matter causing cognitive impairment
 - B. Basal ganglia infarct causing cognitive impairment
 - C. Multiple cortical infarcts causing cognitive impairment
 - D. Periventricular white matter infarcts causing cognitive impairment
 - E. Single strategically placed infarct causing cognitive impairment
- 31. The risk of developing late-onset Alzheimer's dementia in first-degree relatives of patients with late-onset Alzheimer's dementia compared with controls is**
- A. 5 times higher
 - B. 3 times higher
 - C. 10 times higher
 - D. No higher than the general population
 - E. 16 times higher
- 32. In CJD pathological study of brain tissue shows spongiosis with neuronal loss, gliosis, and amyloid plaques. These amyloid plaques contain**
- A. Synuclein
 - B. Immunoglobulin
 - C. Prion protein
 - D. Amylin
 - E. Presenilin
- 33. Pulvinar sign is a MRI finding in which of the following conditions?**
- A. Huntington's dementia
 - B. Variant CJD (vCJD)
 - C. Lewy body dementia
 - D. Subdural haematoma
 - E. Extradural haemorrhage
- 34. The most prevalent neurotic disorder among elderly people above the age of 65 is**
- A. Phobic disorders
 - B. Obsessive compulsive disorder
 - C. Generalized anxiety disorder
 - D. Panic disorder
 - E. Post-traumatic stress disorder

35. Suicide is a significant risk when treating elderly patients with mental health problems. Compared with suicides in younger adults, older patients who kill themselves are

- A. More likely to enter into suicide pacts
- B. More likely to be known to mental health services
- C. Less likely to suffer from depression
- D. More likely to be females
- E. More likely to have a treatment history for psychiatric complaints

36. All of the following are necessary to establish the competence to make a will except

- A. The person should know what the act of making a will means
- B. The person should have a broad understanding of the extent of his/her estate
- C. The person should know who might have claims on his/her possessions
- D. The person should not have a disorder affecting his/her mind
- E. The person should not be under any undue influence

37. Compared with mania at younger age of onset, late-onset mania in elderly people is characterized by

- A. Stronger genetic loading
- B. Lesser frequency of cerebral pathology
- C. Higher rates in women
- D. Higher admixture of depressive features
- E. Lesser risk of subsequent depressive episode on recovery

38. Which of the following antidementia drugs acts directly on nicotinic receptors to increase cholinergic neurotransmission?

- A. Memantine
- B. Donepezil
- C. Rivastigmine
- D. Galantamine
- E. Tacrine

39. The plasma half-life of memantine is approximately

- A. 2–4 hours
- B. 30–90 minutes
- C. 60–80 hours
- D. 24–48 hours
- E. 2–3 weeks

40. The anticholinesterase agent with least drop-out rates in longitudinal trials is

- A. Galantamine
- B. Tacrine
- C. Donepezil
- D. Rivastigmine
- E. All available agents have similar drop-out rates

- 41. In the pharmacological management of delirium, haloperidol is the preferred agent from the available antipsychotic drugs. All of the following explain the above except**
- A. Availability of multiple routes of administration for haloperidol
 - B. Availability of guided dosing strategies for haloperidol in delirium
 - C. Lack of significant anticholinergic effect
 - D. Lack of significant sedating properties
 - E. Lack of significant hypotensive effect
- 42. Which of the following over-the-counter prescriptions used to enhance cognition is associated with coagulation dysfunction as a side-effect?**
- A. Vitamin E
 - B. Gingko biloba
 - C. Oestrogen
 - D. Selegiline
 - E. Fish oils
- 43. In elderly people with failing eyesight Charles Bonnet syndrome is not uncommon. Which of the following features if present support the diagnosis?**
- A. Auditory hallucinations
 - B. Poor attention span
 - C. Clear consciousness
 - D. Generalized seizures
 - E. Parkinsonian tremors
- 44. Senile self-neglect with significant reclusiveness in elderly people is called Diogenes syndrome. Which of the following is false with respect to this condition?**
- A. Equal sex distribution
 - B. Cannot be diagnosed in the absence of cognitive impairment
 - C. Medical contact is often initiated by neighbours
 - D. Associated with high degree of mortality
 - E. Higher rates of personality disorders
- 45. The prevalence of potentially reversible dementia among all cases diagnosed with dementia is estimated to be around**
- A. <1%
 - B. <2%
 - C. <5%
 - D. <10%
 - E. <20%

46. Which of the following is true with regard to alcohol use disorders in elderly people?

- A. The prevalence rates have been overestimated
- B. The safe weekly limit for an elderly man is 21 units
- C. The most common clinical presentation is symptoms of intoxication
- D. Lifetime alcohol consumption is an important indicator of alcohol use
- E. The CAGE questionnaire is not useful as a screening tool

47. The most common perpetrators of elder abuse in private UK households are

- A. Spouses
- B. Sons
- C. Care workers
- D. Siblings
- E. Neighbours

48. All of the following are associated with a higher risk of elder abuse except

- A. Diagnosis of dementia in the victim
- B. Perpetrator and victim living separately
- C. Social isolation of the victim
- D. Psychiatric diagnosis in the perpetrator
- E. Perpetrator being financially dependent on the victim

49. Which of the following drugs has the least evidence in the form of randomized controlled trials (RCTs) for the management of behavioural and psychological symptoms of dementia?

- A. Olanzapine
- B. Risperidone
- C. Haloperidol
- D. Zolpidem
- E. Rivastigmine

50. Cholinesterase inhibitors are unlikely to be useful in the management of

- A. Lewy body dementia
- B. Alzheimer's dementia
- C. Mixed dementia
- D. Frontotemporal dementia (FTD)
- E. Early-onset dementia of Alzheimer's type

1.B. The process of ageing can be classified as primary ageing, which accounts for the relatively constant lifespan observed in a species, and secondary ageing, which explains much of the unpredictability among individual members of the species. The primary ageing process is most probably constitutional and is probably wired in the cellular machinery. This was demonstrated by Hayflick and colleagues, who showed that the maximum number of cell divisions that can occur in normal human cells in culture is approximately 40–60. Many functional capacities of the cells reduce as the cells approach the Hayflick limit. This 'Hayflick phenomenon' is under genetic control; it is not limited to laboratory culture methods. Pruning is a developmental phenomenon by which unnecessary synapses formed during brain development are removed. Apoptosis refers to programmed cell death.

Spar JE and Rue AL. *Clinical Manual of Geriatric Psychiatry*. American Psychiatric Publishing, 2006, p. 49.

2.D. The Hachinski Ischaemic Score is an easy-to-use clinical tool that aids in the bedside differentiation of Alzheimer's dementia from vascular dementia. It has been validated in patients with pathologically confirmed dementia. A cut-off score ≤ 4 supports a diagnosis of Alzheimer's dementia while a score ≥ 7 favours vascular dementia. These cut-off values have a sensitivity of 89% and a specificity of 89%. Abrupt onset, fluctuating course, history of stroke, presence of focal neurological symptoms and signs strongly favour a diagnosis of vascular dementia. Other supporting features for a diagnosis of vascular dementia include stepwise deterioration, presence of nocturnal confusion, absence of changes in personality, presence of emotional incontinence, depression and a history of hypertension.

Moroney JT. Meta-analysis of the Hachinski Ischaemic Score in pathologically verified dementias. *Neurology* 1997; **49**: 1096–1105.

3.A. In dementia complex ADL that require use of tools and equipment (instrumental ADLs) are affected earlier than basic ADL. Although self-report ADL measures are rare, they do exist. For example, the ADL-Prevention Instrument (ADL-PI) has a self-rated version and an informant version. Self-ratings are found to be closer to research observer's ratings, while family members tend to under-rate the ADL. Data from self-report of functioning predicts mortality better than informant data. The Barthel Index consists of 10 items that measure a person's ADL and mobility. It can be used to determine a baseline level of functioning and also to monitor changes in ADL over time. It is rated by carers or professionals. Currently, functional capacity measures are being used increasingly in pharmacological trials of patients with dementias as primary outcome measures. ADL scales are not gender biased and are commonly used in both sexes.

Massoud F. The role of functional assessment as an outcome measure in antidementia treatment. *Can J Neurol Sci* 2007; **34 Suppl 1**: S47–51.

4.D. Huntington's disease is inherited in an autosomal dominant fashion. It is a neurodegenerative disorder related to expansion of a trinucleotide repeat sequence in the short arm of chromosome 4. Clinical features include a triad of choreic movements, cognitive decline, and psychiatric syndromes starting in the fourth to fifth decade. Psychiatric presentation is usually variable and can precede motor and cognitive changes. Most common psychiatric problems include change in personality (impulsive, disinhibited, and dissocial) and depression. Paranoid schizophrenia-like symptoms occur in 6–25% of cases. Such schizophrenia-like presentation is very rare in other conditions listed.

Correa B, Xavier M, and Guimaraes J. Association of Huntington's disease and schizophrenia-like psychosis in a Huntington's disease pedigree. *Clinical Practice and Epidemiology in Mental Health* 2006; **2**: 1.

5.D. Body composition changes with advancing age resulting in alterations in the way drugs are metabolized and circulated. Muscle mass and body water decline by as much as 25% by age 70 while the body lipid content increases. Body fat constitutes >40% of body weight in elderly women and >30% in elderly men. As a result, elderly people have a larger volume of distribution and longer half-life of lipophilic drugs. Lipid-soluble drugs such as diazepam have greater volume of distribution and half-life with slower clearance in elderly individuals.

Ginsberg G, Hattis D, Russ A, and Sonawane B. Pharmacokinetic and pharmacodynamic factors that can affect sensitivity to neurotoxic sequelae in elderly individuals. *Environmental Health Perspectives* 2005; **113**: 1243–1249.

6.A. The Neuropsychiatric inventory (NPI) can be used to measure behavioural and psychological features of dementia in elderly people. It was created by Cummings et al. It evaluates 10–12 neuropsychiatric disturbances common to dementia using frequency, severity and the carer's distress as indices. The Bristol scale is used to measure activities of daily living; the Cornell depression scale is used to assess depression in demented patients. The abbreviated mental test is a quick and easily administered test that is used as a screening tool for dementia.

Kaufer DI, Cummings JL, Ketchel P, et al. Validation of the NPI-Q, a brief clinical form of the Neuropsychiatric Inventory. *Journal of Neuropsychiatry and Clinical Neurosciences* 2000; **12**: 233–9.

7.C. The ADAS-Cog is used as the *de facto* standard primary outcome neuropsychological measure for dementia trials. It measures several cognitive domains, including memory, language, and praxis with total scores ranging from 0 to 70. A four-point change on the ADAS-Cog at 6 months after starting antementia drugs has been used as an arbitrary cut-off point indicating a clinically important difference. This pharmaceutical cut-off on ADAS-Cog must be interpreted in the context of overall response when it is translated to clinical practice. MMSE is not as sensitive to change as ADAS-Cog; hence, it is rarely used as a primary outcome measure in dementia trials. An MRI brain scan currently has no role in monitoring treatment response.

Rockwood K, Fay S, Gorman M, et al. The clinical meaningfulness of ADAS-Cog changes in Alzheimer's disease patients treated with donepezil in an open-label trial. *BMC Neurology* 2007; **7**: 26.

8.B. Alzheimer's dementia is associated with an annual decline on the MMSE of 3–4 points. Similarly using the ADAS-Cog scale, the natural disease progression averages a 7-point decline per year. But the average change on ADAS-Cog when using antidementia drugs is about 2.7 points. Thus cholinesterase inhibitors are considered to delay this progression by 6 months on average. MMSE is a reasonable tool for monitoring disease progression in a clinical setting, but the occurrence of functional impairment is more likely to be relevant to the patient and their carers than MMSE scores. Performance in instrumental activities of daily living such as telephone use, taking own medication, handling finances, and transport correlates well with cognitive impairment.

Woodford HJ and George J. Cognitive assessment in the elderly: a review of clinical methods. QJM 2007; **100**: 469–484.

9.A. Generally, a high level of suspicion is needed to detect hyponatraemia in a depressed patient who does not undergo regular blood tests for electrolytes. The symptoms of hyponatraemia overlap with those of depression, making it hard to diagnose. Hyponatraemia due to selective serotonin reuptake inhibitors (SSRIs) or other antidepressant use is often linked to the syndrome of inappropriate antidiuretic hormone (SIADH) secretion. Increased age, female gender and co-prescription of diuretics are notable risk factors. Symptoms usually occur when the blood serum level falls below 130 mmol/L. These include lethargy, fatigue, muscle cramps, and headaches.

Baldwin R and Wild R. Management of depression in later life. *Advances in Psychiatric Treatment* 2004; **10**: 131–139.

10.E. Plaques seen in the brain of patients with Alzheimer's dementia are insoluble extracellular deposits composed mainly of A β peptides. These A β peptides are derived from a transmembrane protein called B-amyloid precursor protein (APP) through proteolytic processing. APP is generally cleaved by β -secretase or α -secretase enzymes followed by γ -secretase. A β peptides are generated when APP is cleaved by β -secretase followed by γ -secretase. This pathway is amyloidogenic and forms the major metabolic pathway of APP in brain tissue; the non-amyloidogenic α -secretase pathway is the major pathway in other tissues. Presenilins are necessary for proteolytic activity of γ -secretase. PS/ γ -secretase complex is widely considered as a potential target for developing therapies against Alzheimer's disease.

Selkoe DJ. Presenilin, Notch, and the genesis and treatment of Alzheimer's disease. *Proceedings of the National Academy of Sciences USA* 2001; **98**: 11039–11041.

11.E. DCM is an observational tool designed to evaluate the quality of care and well-being of people with dementia in formal care settings. It was designed by Kitwood in 1992. DCM is based on the social-psychological theory of dementia care, which states that much of the decline in patients with dementia is a direct consequence of the social and environmental situation experienced. Better social care may result in less suffering than would otherwise be expected from their neurological state. The Washington University CDR is a global scale developed to clinically denote the presence of Alzheimer's dementia and stage its clinical severity using semi-structured interviews with the patient and informants. The Burden Interview and Caregiver Burden Scale are used to measure the degree of caregiver strain.

Beavis D, Simpson S, and Graham I. A literature review of dementia care mapping: methodological considerations and efficacy. *Journal of Psychiatric and Mental Health Nursing* 2002; **9**: 725–736.

12. E. An array of various terms has been used to describe age-associated cognitive impairment not amounting to dementia. The most popular term is MCI, of which several types have been described of late. The amnestic MCI refers to the original description of MCI. Diagnosis of MCI requires the presence of memory complaint (preferably corroborated by an informant), objective memory impairment for age, preserved general cognitive function, normal functional activities, and no dementia. The presence or absence of family history of dementia is not a criterion used to describe MCI.

Chong MS, and Sahadevan S. Preclinical Alzheimer's disease: diagnosis and prediction of progression. *Lancet Neurology* 2005; **4**: 576–579.

13. D. The Lund–Manchester criteria are used in the diagnosis of frontotemporal dementia. The criteria were initially developed in 1994 and were later updated in 1998. The following core components are required for a diagnosis:

1. insidious onset and gradual progression
2. early decline in social interpersonal conduct
3. early impairment in regulation of personal conduct
4. early emotional blunting
5. early loss of insight

Other supportive diagnostic features include:

- A. Behavioural disorder (decline in personal hygiene, mental rigidity and inflexibility, distractibility and impersistence, hyperorality and dietary change, utilization behaviour)
- B. Speech and language disturbances (altered speech output, stereotypy of speech, echolalia, perseveration, mutism)
- C. Physical signs (primitive reflexes, incontinence, akinesia, rigidity, tremor)
- D. Abnormal investigations (neuropsychological evidence of impaired frontal lobe function, normal conventional EEG despite clinically evident dementia and predominant frontal and/or anterior temporal abnormality in neuroimaging)

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 341.

14. B. Visual hallucinations dominate the clinical picture of dementia with Lewy bodies (DLB) in many patients. Visual hallucinations have a tendency to persist despite treatment in many patients. In phenomenological quality, the hallucinations of DLB are similar to those reported in Parkinson's disease dementia: they are vivid, colourful, three-dimensional, and generally mute images of animate objects. Visual hallucinations are associated with greater deficits in cortical acetylcholine and predict better response to cholinesterase inhibitors

McKeith I, Mintzer J, Aarsland D, et al. Dementia with Lewy bodies. *Lancet Neurology* 2004; **3**: 19–28.

15. C. It is reported that 25–50% of patients with DLB have extrapyramidal signs at the time of diagnosis, and another 25% develop extrapyramidal signs during the natural course of DLB. A quarter of all DLB patients have no extrapyramidal signs at all until death. So parkinsonism is not necessary for clinical diagnosis of DLB. Often a diagnosis of DLB is missed as clinicians look for extrapyramidal signs or suspect cerebrovascular disease. The pattern of extrapyramidal signs in DLB shows greater postural/gait instability and facial impassivity but less tremor. This pattern of parkinsonism is over-represented in both DLB and demented patients with Parkinson's disease. But non-demented Parkinson's disease patients show equal distribution of a tremor-dominant pattern and postural/gait instability pattern. It is possible that the tremor-related pattern is more dopamine-dependent dysfunction whereas postural/gait problems are more non-dopaminergic.

McKeith I, Mintzer J, Aarsland D, et al. Dementia with Lewy bodies. *Lancet Neurology* 2004; **3**: 19–28.

16.B. Multiple factors have been examined in an attempt to predict the treatment response in elderly depressed patients. A prospective study examining neurological and neuropsychological factors showed that a combination of extrapyramidal signs, pyramidal tract signs, and impairment of motor hand sequencing strongly predicted resistance to 12 weeks of antidepressant monotherapy, with 89% sensitivity and 95% specificity. Microstructural white matter abnormalities may also perpetuate depressive symptoms in older adults by disrupting connectivity with cortico-striato-limbic networks, which form the basis of mood regulation. Lower fractional anisotropy in this network predicted poorer treatment response in geriatric depression. Although enlarged cerebral ventricles have been reported in some studies, this is not examined as a predictor of treatment response. Earlier age of onset and somatic symptoms suggest better response to initial antidepressant treatment.

Simpson S, et al. Is subcortical disease associated with a poor response to antidepressants? Neurological, neuropsychological and neuroradiological findings in late-life depression. *Psychological Medicine* 1998; **28**: 1015–1026.

Alexopoulos GS and Murphy CF, Gunning-Dixon FM, et al. Microstructural white matter abnormalities and remission of geriatric depression. *American Journal of Psychiatry* 2008; **165**: 238–244.

17.C. Executive dysfunction predicts a poor or delayed response to antidepressant therapy and also a greater risk of relapse after discontinuing treatment. None of the other core symptoms of depression has been shown to be strong predictors of later relapse.

Kroenke K. A 75-year-old man with depression. *Journal of the American Medical Association* 2002; **287**: 1568–1576.

18.D. Late-life depression often occurs in the context of medical health issues; it is two to three times more common in the medically ill elderly patient. The diagnosis 'depression due to a general medical condition' (more commonly, secondary depression) is used when depressed mood or anhedonia occur in patients already diagnosed with an illness that is clearly linked to depression as a physiological consequence. For example, nearly 25% of patients with myocardial infarction have a major depressive episode. Primary depression can exist alongside a general medical condition with no direct physiological relationship. In fact, such co-existing depression and a general medical condition is more common than depression secondary to medical problems. Depression may also exacerbate the outcome of medical illnesses. Although hypothyroidism is considered to cause depression traditionally, recent studies show that a TSH value of 10 µU/L or greater was found in only 0.7% of elderly patients with clinical depression. Thus the rate of subclinical hypothyroidism in an elderly depressed group may be similar to that of the elderly population in general.

Kroenke K. A 75-year-old man with depression. *Journal of the American Medical Association* 2002; **287**: 1568–1576.

19.E. The term late-onset schizophrenia is applied to patients whose first symptom of schizophrenia-like psychosis begins after the age of 40. For patients whose symptoms begin after the age of 60, the term very-late-onset schizophrenia-like psychosis (VLOSLP) is used. Paranoid delusions are the most common symptoms in late-onset schizophrenia, followed by auditory hallucinations. Partition delusions are often noted in late/very late-onset schizophrenia where the patient typically believes that people, objects, or radiation can pass through what would normally constitute a barrier to such passage. Negative symptoms are conspicuously absent in most cases. In psychosis associated with Alzheimer's dementia, simple paranoid delusions are more common than hallucinations. In psychosis associated with Parkinson's disease, visual hallucinations are more common than delusions.

Mintzer J and Targum SD. Psychosis in elderly patients: classification and pharmacotherapy. *Journal of Geriatric Psychiatry and Neurology* 2003; **16**: 199–206.

Howard R, Castle D, O'Brien J, et al. Permeable walls, floors, ceilings and doors. Partition delusions in late paraphrenia. *International journal of geriatric psychiatry* 1992; **7**: 719–724.

20.A. Some individuals with abnormal grief reaction may be avoiding reminders of their grief, leading to unresolved emotions. Addressing these issues by encouragement may not be sufficient and a behavioural approach may be needed in some cases. The approach commonly used is known as guided mourning. This treats unresolved grief in a way similar to other forms of phobic avoidance by exposure to the avoided situation. Thus guided mourning involves intense reliving of avoided painful memories and feelings associated with bereavement. During treatment, patients are exposed to avoided painful memories or situations related to the loss of their loved one – both in imagination and in real life.

Clark A. Working with grieving adults. *Advances in Psychiatric Treatment* 2004; **10**: 164–170.

21.E. Elderly people with depression may have a relapse or recurrence of a depressive disorder from adulthood (early onset) or they might have fresh onset late-life depression. Late-onset major depression includes a large subgroup of patients with neurological problems. It is possible that milder, unnoticed episodes of depression with early-onset might be a risk factor for late-life depression by contributing to brain abnormalities. When compared with elderly individuals with early-onset major depression, patients with late-onset major depression have a less frequent family history of mood disorders, a higher prevalence of disorders of dementia, a larger impairment in neuropsychological tests, a higher rate of dementia development on follow-up, more neurosensory hearing impairment, a greater enlargement in lateral brain ventricles, and more white matter hyperintensities.

Alexopoulos GS. Depression in the elderly. *Lancet* 2005; **365**: 1961–1970.

22.C. A systematic review of studies looking at improvements in caregiver psychological health revealed that six or more sessions of individual behavioural management therapy had the highest quality of evidence. This intervention was effective for up to 32 months after intervention. There was some evidence supporting individual and group caregiver coping sessions to reduce depression among caregivers; the benefits may last up to 3 months. Educational interventions, group behavioural management sessions, fewer than six individual behavioural management sessions, and supportive therapy were not effective interventions for reducing a caregiver's symptoms.

Selwood A, Johnston K, Katona C, et al. Systematic review of the effect of psychological interventions on family caregivers of people with dementia. *Journal of Affective Disorders* 2007; **101**: 75–89.

23.A. Reminiscence therapy uses materials such as old newspapers and household items to stimulate memories and enable people to share and value their experiences. The evidence base for this therapy in improving behavioural problems is limited. It may have a modest impact on mood symptoms. Validation therapy is based on Rogerian humanistic psychology; it encourages individual uniqueness and gives the opportunity to resolve conflicts by encouraging and validating the expression of feelings and emotions. Reality orientation therapy is based on the fact that patients with dementia function poorly secondary to impairment in orientating information (day, date, weather, time, and use of names). Hence reminders can improve functioning. Cognitive stimulation therapy is similar to reality orientation therapy but aims at improving information processing rather than factual knowledge to address problems in functioning in patients with dementia. Snoezelen therapy is also called multisensory stimulation. It is grounded on the supposition that neuropsychiatric symptoms may result from periods of sensory deprivation. It combines relaxation and exploration of sensory stimuli (e.g. lights, sounds, and tactile sensations).

Livingston G, Johnston K, Katona C, et al. Systematic review of psychological approaches to the management of neuropsychiatric symptoms of dementia. *American Journal of Psychiatry* 2005; **162**: 1996–2021.

24.D. Psychosis is a prominent non-cognitive symptom seen in Alzheimer's dementia. The prevalence of psychosis in patients with Alzheimer's dementia has been estimated at 30–50%. Psychotic symptoms are seen in 0.2–4.7% of the elderly population in the community. In nursing homes the prevalence rates are very high – 10–60%. Dementia accounts for the highest number of psychotic symptoms diagnosed among elderly people. Prospective studies have shown that 36.7% of patients with psychotic symptoms may have dementia, most likely of Alzheimer's type.

Holroyd S and Laurie S. Correlates of psychotic symptoms among elderly outpatients. *International Journal of Geriatric Psychiatry* 1999; **14**: 379–384.

25.A. Bowlby and Parkes proposed a stage theory of grief for adjustment to bereavement that included four stages: shock–numbness, yearning–searching, disorganization–despair, and reorganization. This was adapted by Kubler-Ross, who described a five-stage response of terminally ill patients to impending death: denial–dissociation–isolation, anger, bargaining, depression, and acceptance (mnemonic: DABDA). A longitudinal cohort study (Yale Bereavement Study) has established that in terms of absolute frequency, disbelief was not the initial grief indicator as proposed by the original grief theory. The study found that most people endorsed acceptance as initial reaction even in the initial month after loss in cases of natural deaths. In contrast, family members of those who had a traumatic death and individuals with complicated grief disorder had significantly lower levels of acceptance. It was also noted that prognostic awareness of a patient's terminal illness for more than 6 months before death may promote acceptance of the death.

Maciejewski PK, Zhang B, Block SD, and Prigerson HG. An empirical examination of the stage theory of grief. *Journal of the American Medical Association* 2007; **297**: 716–723.

26.E. The presence of hippocampal atrophy in patients with amnestic MCI may predict the onset of later dementia. The risk of conversion to dementia is four times higher in 5 years when hippocampal atrophy is present. It is generally accepted that the closer one's cognitive ability, brain imaging, and genetic susceptibility are to AD, the more likely is the progression to dementia from MCI. Other factors predicting conversion include older age, greater severity of baseline cognitive deficits, especially impaired episodic recall and hypoperfusion of multiple brain regions in neuroimaging studies. It is also noted that multidomain amnestic MCI has a higher conversion rate than pure amnestic MCI. This conversion is more pronounced if the cognitive complaints are accompanied by carers' reports of impaired daily function. Sensory impairment has no role in such predictions.

DeCarli C. Mild cognitive impairment: prevalence, prognosis, aetiology, and treatment. *Lancet Neurology* 2003; **2**: 15–21.

27.A. It is very difficult to conclusively decide on epidemiological facts of mild cognitive impairment due to the variations in diagnostic terms and inclusion criteria used in epidemiological research. A prevalence between 3% and 19% has been reported in elderly people. The age-specific prevalence of MCI is greater than that of dementia. MCI is about four times more common than dementia when based on community assessment of non-institutionalized individuals. An incidence of 8–58 per 1000 per year and a risk of developing dementia of 11–33% over 2 years have been quoted. The progression of amnestic MCI to dementia has been examined in various clinical populations. Generally a yearly incidence of dementia of 10–15% has been quoted for those with MCI attending memory clinics (compare this with general rates of 1–2% in elderly people). Community-based studies show slightly lower rates of conversion closer to 5–10% per year. A significant number of those with amnestic MCI actually improve their cognitive performance during follow up. Up to 44% of patients with mild cognitive impairment are estimated to return to normal a year later.

Gauthier S, Reisberg B, Zaudig M, et al. Mild cognitive impairment. *Lancet* 2006; **367**: 1262–1270.

28.C. It is important to note that AD by itself is not a fatal disease. The median survival time following a diagnosis of AD depends strongly on the patient's age at diagnosis. The older the age at diagnosis, the higher the chances of death. For example, some studies have shown a difference in median survival time of around 5 years between those diagnosed with dementia at the age of 65 and those diagnosed at the age of 90. The median survival from initial diagnosis is higher for men than women in some studies but this is not consistently shown. The presence of frontal lobe release signs, extrapyramidal signs, and gait disturbance, history of falls, congestive heart failure, ischaemic heart disease, and diabetes at baseline may predict shorter survival. Based on numerous longitudinal studies, a median survival of 5–8 years has been estimated. A multicentre prospective population-based cohort study in England and Wales with 14 years' follow-up reported median survival after the estimated onset of dementia as 4.6 years for women and 4.1 years for men. There was a difference of nearly 7 years in survival between the younger old and the oldest people with dementia: 10.7 years for ages 65–69 vs. 3.8 years for ages ≥90. Significant factors that predicted mortality in the presence of dementia during the follow-up included sex, age of onset, and disability before the onset. Type of accommodation, marital status, and self-reported health were not associated with survival.

Gelder MG et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 336.

Larson EB, Shadlen M-F, Wang L, et al. Survival after Initial Diagnosis of Alzheimer Disease. *Annals of Internal Medicine* 2004; **140**: 501–509.

Xie J, Brayne C, and Matthews FE et al. Survival times in people with dementia: analysis from population based cohort study with 14 year follow up. *British Medical Journal* 2008; **10**: 1136.

29.D. Braak's staging system has been used to grade pathologically the various degrees of dementia severity. It is based on the appearance of neurofibrillary tangles in brain. These tangles commence the transentorhinal and entorhinal cortex spreading to the hippocampus, and then extend across the remaining limbic system before involving other cortical regions, followed by the primary motor and somatosensory cortices, and finally the occipital cortex. This progression is the basis of the Braak's staging. A decline in memory test performance and mental state of the demented patient correlate with the pathological progression through the neocortical Braak stages.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 337.

30.A. The term Binswanger's disease refers to a type of subcortical vascular dementia caused by widespread, microscopic atherosclerotic vascular damage to the deep white matter in the brain. As a result patients may have frontal executive dysfunction, short-term memory loss, and behavioural changes. The most characteristic feature is said to be the reduction of processing speed. An MRI scan of the brain can reveal the characteristic brain lesions essential for diagnosis. Single large infarcts or multiple cortical infarcts give rise to vascular dementia. Periventricular white matter lesions are non-specific and are commonly seen in Alzheimer's dementia, extreme ageing with vascular risk factors, and also in patients with frank vascular dementia.

Nagata K, Saito H, Ueno T, et al. Clinical diagnosis of vascular dementia. *Journal of the Neurological Sciences* 2007; **257**: 44–48.

31.B. An actual predicted risk of developing Alzheimer's disease in first-degree relatives of probands with Alzheimer's disease is 15–19%, compared with 5% in controls. Thus, the risk to first-degree relatives of patients with Alzheimer's disease who developed the disorder at any time up to the age of 85 years is increased to 3–4 times relative to the risk in controls. This would seem to translate to a risk of developing Alzheimer's disease of between one in five and one in six.

Liddell, et al. Genetic risk of Alzheimer's disease: advising relatives. *The British Journal of Psychiatry* 2001; **178**: 7–11.

32.C. The core neuropathology of CJD is characterized by spongiform change, neuronal loss, astrocytosis, and amyloid plaque formation. The amyloid plaques in CJD are generally made of insoluble prion proteins. In addition, abnormal neuritic dendrites with white matter necrosis and beta protein amyloid angiopathy may also be seen.

Tetsuyuki KJ, Takatoshi T, Takeshita I, et al. Amyloid plaques in Creutzfeldt-Jakob disease stain with prion protein antibodies. *Annals of Neurology* 1986; **20**: 204–208.

33.B. vCJD causes rapidly progressive dementia, often leading to death in relatively young patients. Symmetrical hyperintensity in the posterior nuclei of the thalamus, called the pulvinar sign, is seen on brain MRI images of most patients with vCJD. This is described as a specific, non-invasive, and highly accurate diagnostic sign of vCJD; FLAIR (fluid-attenuated inversion recovery) sequences are more sensitive than T1 weighted, T2 weighted or proton density MRI. The pulvinar sign is reported to have a sensitivity of 78% and specificity of 100%. The pulvinar sign has been so far demonstrated only in symptomatic patients; its validity as a screening test in presymptomatic patients is unclear.

Macfarlane RG, Wroe SJ, Collinge J, et al. Neuroimaging findings in human prion disease. *Journal of Neurology, Neurosurgery, and Psychiatry* 2007; **78**: 664–670.

34.A. Phobic disorders are the most common neurotic conditions noted in epidemiological studies of elderly people. Despite great variations in the reported rates of all neurotic disorders in elderly people, the overall prevalence of neurotic disorders is thought to vary between 2.5% and 14.2% of the population aged 65 years or older. The reported prevalence of phobic disorders varies enormously from 1.4% to 25.6% in various studies due to differences in the instruments used, and variable application of hierarchical case ascertainment rules when dealing with agoraphobia. More recently, a longitudinal population study from Europe reported current prevalence rates of 14.2% for anxiety disorders as a whole, 10.7% for phobia, 4.6% for generalized anxiety disorder, 3% for major depression, and 1.7% for psychosis in elderly people.

Ritchie K, Artero S, Beluche I, et al. Prevalence of DSM-IV psychiatric disorder in the French elderly population. *British Journal of Psychiatry* 2004; **184**: 147–152.

Bryant C, Jackson H, and Ames D. The prevalence of anxiety in older adults: Methodological issues and a review of the literature. *Journal of Affective Disorders* 2008; **109**: 233–250.

35.A. Older patients who commit suicide are more likely to suffer from depressive illness but are less likely to be known to mental health services or to have been treated for depression than younger adults who kill themselves. It is also known that older people are more likely to enter into suicide pacts. In older people, male suicide rates are higher than female suicides. It is generally accepted that the conversion rate of suicidal thoughts to acts is higher in older patients.

Murray R, Kendler K, et al., eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 374.

36.D. Testamentary capacity refers to the competence for drafting and signing a will. In English law, this is based on case *Banks v Goodfellow* in 1870. The capacity to draw a will requires

1. understanding the nature of the act of drawing a will and its effects
2. understanding the extent of the property being disposed
3. understanding the nature and extent of the claims of those who are included or excluded in the will
4. absence of mental disorder that can affect the previous (1–3) competencies
5. absence of undue influence (duress) by third parties.

Hence a mentally ill individual can have full testamentary capacity if his/her mental illness does not directly influence his/her understanding of the process, the extent of his/her estate, or the nature of claims that could be made to his/her estate.

Murray B and Jacoby R. The interface between old age psychiatry and the law. *Advances in Psychiatric Treatment* 2002; **8**: 271–278.

37.D. Late-life mania is often different from earlier onset mania. There is a prominent mixture of depressive symptoms in late-life mania; in addition, those with late-onset mania are more likely to have had a depressed phase during their first admission. Occasionally, manic symptoms in late life may herald the onset of frontal-type dementia. It is also shown that men may have higher rates of mania in late-life than women – one series reported a difference of 60% in men to 10% in women. A significant association with cerebral organic disease has been demonstrated, leading to the term secondary mania in cases with organic aetiology. A higher tendency to find vascular lesions in neuroimaging studies of older manic patients has been described. Similar to geriatric depression, late-life mania is also said to have less genetic contribution to aetiology than younger adults with mania.

Murray R, Kendler K, et al., eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 369.

38.D. Tacrine, donepezil, and galantamine selectively inhibit acetylcholinesterase. In addition galantamine also improves cholinergic neurotransmission by acting as an allosteric ligand at nicotinic acetylcholine receptors to increase presynaptic acetylcholine release and postsynaptic transmission. Rivastigmine inhibits butyrylcholinesterase in addition to its inhibition of acetylcholinesterase. Butyrylcholinesterase forms around 10% of the total cholinesterase in normal human brains and it is mainly associated with glial cells. With the progression of dementia, it is noted that acetylcholinesterase activity decreases while butyrylcholinesterase activity stabilizes or even increases in relation to glial proliferation. This may lead to changes in the ratio of acetylcholinesterase to butyrylcholinesterase. To date, a significant difference in the clinical efficacy of rivastigmine compared with donepezil or galantamine in advanced dementia has not been demonstrated

Scarpini E, Scheltens P, and Feldman H. Treatment of Alzheimer's disease; current status and new perspectives. *Lancet Neurology* 2003; **2**: 539–547.

39.C. Memantine is a non-competitive NMDA antagonist that prevents excess calcium from entering the neurons leading to a neuroprotective effect. It is completely absorbed from the gastrointestinal tract with a bioavailability of 100%. Memantine exhibits linear (first order) pharmacokinetics over the entire dosage range of 10–40 mg/day. It rapidly passes the blood–brain barrier within 30 minutes of absorption. Forty-five per cent of the drug binds to plasma proteins. It is metabolized by glucuronidation, hydroxylation, and N-oxidation. Seventy-five to 90% of the drug is eliminated via the urine, with 10–25% of the drug eliminated in the bile and faeces. The elimination half-life is about 60–80 hours. Excessively alkaline urine can decrease the excretion.

Robinson DM, Keating GM. Memantine: a review of its use in Alzheimer's disease. *Drugs* 2006; **66**: 1515–1534.

40.C. Head-to-head comparisons of antidementia drugs show similar effects on measures of cognition and behaviour for rivastigmine, galantamine, and donepezil. But the analysis of withdrawals before the end of the study period showed significant differences between donepezil and other medications in the group – especially rivastigmine. Similarly, a meta-analysis that compared the effect of galantamine, rivastigmine, and donepezil on safety (drop-outs due to adverse events) and selected cognitive outcomes showed a comparable benefit on ADAS-Cog scores compared with placebo for all three drugs; a dose-related effect was observed for donepezil and rivastigmine but not galantamine. There was evidence for increased drop-out rates with both galantamine and rivastigmine compared with donepezil.

Tyler P and Silk K., eds. *Cambridge Textbook of Effective Treatments in Psychiatry*. Cambridge University Press, 2008, p 224.

41.B. Many practice guidelines for the treatment of patients with delirium support the use of antipsychotics as the drugs of choice in delirium. Haloperidol is the most frequently used due to the different available routes of administration, a lack of anticholinergic side-effects, few active metabolites, and the low likelihood of causing adverse effects such as sedation and hypotension, which can be difficult to manage in an acute confusional state. But as QT prolongation is a possible side-effect, it is advisable to have a baseline ECG before such use is attempted in high-risk patients. These recommendations do not have much evidence base but are largely driven by retrospective chart surveys; hence, there is a dearth of data on dosage guidance. It is suggested that haloperidol is given at half the adult dose in elderly people.

Tyler P and Silk K., eds. *Cambridge Textbook of Effective Treatments in Psychiatry*. Cambridge University Press, 2008, p 181.

42. B. Gingko biloba extract is widely used as a herbal preparation for dementia and other cognitive difficulties. Gingko has a significant effect on prostaglandin metabolism and it antagonizes the platelet aggregating factor. As a result platelet function may be compromised especially when other anticoagulants like warfarin are co-administered. Many cases of internal bleeding and postoperative bleeding have been attributed to Gingko. Monitoring bleeding time may be an option in high-risk patients, but this is only a crude measure of platelet dysfunction.

Fong KCS and Kinnear PE. Retrobulbar haemorrhage associated with chronic Gingko biloba ingestion. *Postgraduate Medical Journal* 2003; **79**: 531–532.

43. C. Charles Bonnet syndrome is a common cause of complex visual hallucination in elderly people. 10% to 15% of visually impaired elderly patients may have this syndrome. The eponym comes from the Swiss naturalist and philosopher Charles Bonnet, who reported the hallucinations of his 89-year-old grandfather, who was blind with cataracts but saw multiple animated objects. Core features of Charles Bonnet syndrome include the occurrence of recurrent well-formed, vivid, elaborate, and often stereotyped visual hallucinations in a partially sighted person. The patient usually retains insight into the unreal nature of the images. It is important to consider other differential diagnoses, such as Lewy body dementia, psychosis, delirium, neurological illness, and intoxication.

Manford M and Andermann F. Complex visual hallucinations. Clinical and neurobiological insights. *Brain* 1998; **121**: 1819–40.

44. B. Patients with so-called Diogenes syndrome are characterized by aloofness and breakdown of self-care to a severe extent; in some cases they may pose an environmental health hazard. Many of them are resistant to intervention from any agency, including relatives. Men and women are equally affected, but the condition is rare. An annual incidence of 0.5 per 1000 of the population aged over 60 years is reported. Diogenes syndrome is not a diagnostic category and patients form a heterogeneous group with respect to diagnoses. Some of them may have personality disorders, some have dementia while some are diagnosed with late-onset schizophrenia. Overall mortality is high for such patients.

Murray R, Kendler K, et al., eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 374–75.

45. D. Traditionally an optimistically high rate of 10–20% of diagnosed dementia was thought to be due to reversible causes. A systematic review and meta-analysis of evidence in this regard shows a much lower rate of dementia due to potentially reversible causes to be 9% and actual (partial or full) reversal takes place in only 0.6%. Potentially reversible causes tend to be seen more in relatively young patients or in those with more recent onset of symptoms. It is not clear if an improvement in diagnostic practices in primary care has contributed to a lower proportion of patients with reversible dementia being referred. Depression being wrongly diagnosed as dementia forms the major proportion of reversible dementia; metabolic and endocrine issues such as hypothyroidism, vitamin B12 deficiency are other common causes. Subdural haematoma, cerebral tumours, and normal pressure hydrocephalus can cause potentially reversible dementias, although the degree of reversibility is controversial.

Clarfield AM. The decreasing prevalence of reversible dementias: an updated meta-analysis. *Archives of Internal Medicine* 2003; **163**: 2219–2229.

46.D. The prevalence of alcohol use disorders in elderly people is generally lower than in younger adults, but it is generally accepted that the rates are underestimated because of underdetection and misdiagnosis. It is known that elicitation and documentation of alcohol misuse in the medical records of the elderly people is poor. In addition, elderly people are less likely to spontaneously disclose alcohol use. Even in those identified with alcohol misuse, referral to a specialist team is very low, probably due to a degree of existing therapeutic nihilism (the belief that the illness is incurable) among health workers. Alcohol problems often present atypically in elderly people – falls, confusion, and depression are common presentations. It is also often masked by poor physical health. Furthermore, weekly limits of sensible drinking for adults, i.e. 21 units for men and 14 units for women, may not apply to elderly people. This is due to age-related changes in the pharmacokinetics of alcohol. In most countries, age-appropriate limits have not been established for elderly people. A history of lifetime alcohol consumption may be more important than current levels of drinking to ascertain the degree of alcohol use in elderly people. The CAGE questionnaire has relatively good sensitivity and specificity in older people, but, compared with younger adults, it works better in elderly people when supplemented by further questions.

O'Connell H, Chin A-V, Cunningham C, et al. Alcohol use disorders in elderly people-redefining an age old problem in old age. *British Medical Journal* 2003; **327**: 664–667.

47.A. Fieldwork carried out in the UK by the National Centre for Social research showed that 2.6% (1 in 40) of people aged 66 and over living in private households had experienced abuse (from family, friends, or care workers) in the past year. Neglect is the predominant form of mistreatment, followed by financial, physical, and psychological abuse. The rates of sexual abuse were low. Partners (51%) and other family members (49%) were most commonly reported as the perpetrators of mistreatment compared with care workers (13%) or friends (5%).

O'Keeffe M, Hills A, Doyle M, et al. *UK Study of Abuse and Neglect of Older People: Prevalence survey report*. National Centre for Social Research, 2007.

48.B. Various risk factors have been proposed from prospective analysis of elder abuse. Shared living situation is a major risk factor; older people living alone are at lowest risk. Having a 'poor social network' and subsequent social isolation significantly increases the risk of mistreatment. A diagnosis of dementia makes elderly people more vulnerable to mistreatment. The prevalence rates of elder abuse in samples of dementia caregivers is far higher than the elder abuse seen in the general community. Similarly, a higher rate of mental illness, such as depression or substance abuse, among caregivers increases the risk of elder abuse. It is also found that perpetrators of elder abuse tend to be financially dependent on the abused individual.

Lachs, MS and Pillemer, K. Elder abuse. *Lancet* 2004; **364**: 1263–1273.

49.D. Evidence from RCT exists for the treatment of behavioural and psychological symptoms of dementia (BPSD) using atypical antipsychotics, such as olanzapine and risperidone, typical antipsychotics, such as haloperidol, and cholinesterase inhibitors. In addition, RCT evidence exists for use of antidepressants for depressive symptoms in dementia. RCTs suggest an approximate doubling in the risk of cerebrovascular accidents in patients receiving risperidone, olanzapine, or quetiapine. Zolpidem has a weak evidence base for use in BPSD; it may help insomnia in elderly patients with dementia.

Tyler P and Silk K., eds. *Cambridge Textbook of Effective Treatments in Psychiatry*. Cambridge University Press, 2008, p 191.

50.D. Cholinesterase inhibitors have been shown to be useful in the treatment of senile dementia of Alzheimer's type, mixed Alzheimer's and vascular dementia, Lewy body dementia, Parkinson's disease dementia, and young onset Alzheimer's-type dementia. To date, there is no evidence of reasonable quality to recommend their use in FTD. Normal levels of cholinacetyltransferase have been demonstrated in patients with FTD compared with reduced levels seen in Alzheimer's disease; this might explain the lack of efficacy of cholinesterase inhibitors in FTD.

Gelder MG, et al., eds. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 511.

chapter
5

SUBSTANCE USE DISORDERS

QUESTIONS

- 1. According to Jellinek's classification of alcoholism, which of the following types refers to a person who has developed physical and psychological dependence but still maintains the ability to abstain if necessary?**
 - A. Alpha
 - B. Beta
 - C. Gamma
 - D. Delta
 - E. Epsilon

- 2. Which of the following is NOT a criterion for alcohol dependence syndrome as described by Edwards and Gross?**
 - A. A subjective awareness of compulsion to drink
 - B. Increased tolerance to alcohol
 - C. Repeated withdrawal symptoms
 - D. Relief or avoidance of withdrawal symptoms by further drinking
 - E. Reduction in social obligations

- 3. Which of the following is NOT a diagnostic criterion for alcohol dependence according to DSM-IV?**
 - A. Strong desire or sense of compulsion to drink alcohol
 - B. Tolerance
 - C. Withdrawal
 - D. Loss of normal social activities due to drinking
 - E. Continued intake despite knowledge of the harmful effect

- 4. The mortality rate in a person being treated for alcohol withdrawal delirium is**
 - A. 0–1%
 - B. 10–20%
 - C. 20–30%
 - D. 30–40%
 - E. >50%

- 5. What is the typical time period in which withdrawal delirium appears in an alcohol-dependent person who has stopped drinking?**
- A. Within 6 hours
 - B. 6–12 hours
 - C. 2–3 days
 - D. After 7 days
 - E. 2 weeks
- 6. A patient who was found to be unconscious on the roadside was brought to the A&E. While transporting him, he had a seizure in the ambulance. Which of the following best points towards a diagnosis of generalized epilepsy rather than a seizure associated with alcohol-related complications?**
- A. Electrolyte disturbances
 - B. Hypoglycaemia
 - C. Occult subdural haematoma
 - D. Presence of illicit substances in the drug screen
 - E. Generalized spikes and waves on the inter-ictal EEG
- 7. Which of the following is the treatment of choice for status epilepticus in a case of alcohol withdrawal?**
- A. Diazepam
 - B. Chlordiazepoxide
 - C. Lorazepam
 - D. Carbamazepine
 - E. Phenytoin
- 8. Which of the following is a relative contraindication in a case of alcohol withdrawal delirium?**
- A. Diazepam
 - B. Lorazepam
 - C. Haloperidol
 - D. Chlorpromazine
 - E. Chlordiazepoxide
- 9. Failure to diagnose and failure to institute adequate thiamine replacement therapy for Wernicke's encephalopathy is associated with a mortality of nearly**
- A. 5%
 - B. 10%
 - C. 20%
 - D. 30%
 - E. >50%

- 10. If left untreated what percentage of people who develop Wernicke's encephalopathy goes on to develop a severe persistent amnestic syndrome (Korsakoff's dementia)?**
- A. 5%
 - B. 10%
 - C. 20%
 - D. 40%
 - E. 75%
- 11. A severely malnourished patient is admitted to hospital for planned surgery. He develops alcohol withdrawal delirium. He has no signs of Wernicke's encephalopathy. Which of the following is the best strategy for thiamine replacement in this patient?**
- A. Oral thiamine 30 mg three times daily for 5 days
 - B. Oral thiamine 50 mg three times daily for 5 days
 - C. Intravenous thiamine 250 mg three times daily for 5 days
 - D. Intramuscular thiamine 50 mg three times daily for 5 days
 - E. Thiamine is not required as the patient has not developed Wernicke's encephalopathy
- 12. Which of the following is not a risk factor for suicide in an alcohol-dependent individual?**
- A. Male gender
 - B. Age less than 50 years
 - C. Recent interpersonal loss event
 - D. Poor social circumstances
 - E. Polysubstance use
- 13. Lifetime prevalence rates of alcohol use disorder is highest in**
- A. Bipolar disorder
 - B. Schizophrenia
 - C. Panic disorder
 - D. Major depression
 - E. Generalized anxiety disorder
- 14. Psychosocial interventions available for alcohol dependence include motivational enhancement therapy (MET), cognitive behavioural therapy (CBT) and 12-step facilitation programmes (TSF). Which of the following is NOT correct with regard to these interventions?**
- A. Four sessions of MET were found to be equivalent to 12 sessions of CBT
 - B. MET was more cost-effective than CBT
 - C. High levels of anger at baseline predicted better outcomes with CBT than MET
 - D. Participants in Alcoholics Anonymous (AA) responded better with TSF than MET
 - E. 'Meaning-seeking' patients fared better on TSF than MET

15. Which of the following clients are the most suitable for using brief interventions for alcohol use?

- A. Problem drinkers attending primary care
- B. Prisoners with physical health problems due to alcohol use
- C. Moderate alcohol dependence
- D. Severe alcohol dependence
- E. Relapse prevention therapy following achievement of abstinence

16. In the United Kingdom, one unit of alcohol is equivalent to which of the following?

- A. 4 grams of pure alcohol
- B. 6 grams of pure alcohol
- C. 8 grams of pure alcohol
- D. 12 grams of pure alcohol
- E. 24 grams of pure alcohol

17. Which of the following is incorrect with regard to the pharmacokinetics of alcohol?

- A. Most alcohol is absorbed from the small intestine
- B. Pylorospasm can reduce the amount of absorption
- C. Women are less likely to get intoxicated than men for a given dose
- D. A fixed amount of alcohol gets metabolized in the liver irrespective of plasma concentration
- E. Absorption of alcohol is inhibited by the presence of food in the stomach

18. Which of the following has been found to be the best screening method for hazardous drinking in primary care settings?

- A. Alcohol Use Disorders Identification Test (AUDIT)
- B. CAGE questionnaire
- C. Mean corpuscular volume
- D. Gamma glutamyltransferase levels
- E. MAST

19. Which of the following is true with regard to alcoholic blackouts?

- A. They consist of discrete episodes of anterograde amnesia
- B. Loss of memory for the remote past is a characteristic feature
- C. Acute thiamine depletion is the causative factor
- D. Alcoholic blackouts are rare among binge drinkers
- E. Epileptiform activity is almost always noted in EEG during blackouts

20. Which of the following is least likely to be a presenting physical feature of a child with foetal alcohol syndrome (FAS)?

- A. Macrocephaly
- B. Learning disability
- C. Absent philtrum
- D. Syndactyly
- E. Atrial septal defect

- 21. Mr White is an 80-year-old gentleman who has been taking diazepam at a dose of 20 mg at night for the past 3 years. During a trip to France to meet his nephew, he forgets to take his medication. Which of the following is NOT likely to be seen if he experiences benzodiazepine withdrawal?**
- A. Delirium
 - B. Anxiety
 - C. Bursts of high-frequency activity on the EEG
 - D. Insomnia
 - E. Nightmares
- 22. Polymorphisms of genes encoding which of the following enzymes/receptors confers protection from alcohol dependence in certain ethnic groups?**
- A. Aldehyde dehydrogenase (ALDH)
 - B. Amino acid dehydrogenase
 - C. GABA_A receptor
 - D. CYP3A4 enzyme
 - E. HLA-DR2 protein
- 23. Which of the following statements regarding alcohol use and comorbid depression is correct?**
- A. 10–20% of clients who use alcohol have at least one episode of depression in their lifetime
 - B. Abstinence from alcohol does not lead to recovery from depression
 - C. Women with alcohol problems have more comorbid depression than men
 - D. Alcohol reduces the likelihood of successful completion of suicide among the depressed
 - E. Risk of depression is independent of the amount of alcohol consumed daily
- 24. Which of the following best describes the mechanism of action of Acamprosate?**
- A. GABA_A partial agonism
 - B. Blockade of ADH
 - C. Competitive antagonism of ALDH
 - D. Modulating opioid system to reduce craving
 - E. Reducing post-synaptic glutamate neurotransmission at NMDA receptor
- 25. Sam has been diagnosed with alcohol dependence. He has been started on disulfiram following a planned detoxification. You educate him about the effects and side-effects of the medication. Unfortunately, Sam decides to start drinking again after taking disulfiram for 3 weeks. How long should he wait after stopping disulfiram before he can be sure of having no unpleasant side-effects?**
- A. 1–2 hours
 - B. 1–2 days
 - C. 2–7 days
 - D. 1–2 weeks
 - E. 1–2 months

- 26. Learning to walk in a straight line despite the motor impairment produced by alcohol intoxication is best explained by which of the following?**
- A. Pharmacodynamic tolerance
 - B. Pharmacokinetic tolerance
 - C. Behavioural tolerance
 - D. Conditioned tolerance
 - E. Reverse tolerance
- 27. Which of the following is NOT a principle used during motivational interviewing of substance users?**
- A. Expressing empathy
 - B. Helping the client to see discrepancies in their behaviours
 - C. Avoiding argument
 - D. Resisting resistance
 - E. Supporting the patient's sense of self-efficacy
- 28. Which of the following is NOT a risk factor for the development of alcohol hallucinosis?**
- A. Severe alcohol dependence
 - B. Later age of onset of alcohol problems
 - C. Binge drinking
 - D. Higher rate of other substance use
 - E. Family history of schizophrenia
- 29. A decrease in which of the following subtypes of dopamine receptors makes an individual susceptible to relapse in a population with substance use?**
- A. D1
 - B. D2
 - C. D3
 - D. D4
 - E. D5
- 30. Which of the following is NOT shown to be associated with an increase in the risk of development of alcohol abuse in elderly people?**
- A. Family history of alcohol use
 - B. Presence of an organic mental disorder
 - C. Having a drinking partner
 - D. Grief
 - E. Social isolation

- 31. Mr Smith is diagnosed with alcohol dependence syndrome. He receives an educational session regarding the effects of drinking and the potential benefits of abstinence. He does not make any immediate change in his attitude or behaviour but is prepared to consider altering his drinking habits. Which of the following phases of Prochaska's transtheoretical model of change is he in?**
- A. Preparation
 - B. Precontemplation
 - C. Contemplation
 - D. Action
 - E. Maintenance
- 32 Which of the following best describes the learning theory behind the efficacy of supervised disulfiram treatment?**
- A. Aversion theory
 - B. Positive reinforcement
 - C. Negative reinforcement
 - D. Punishment theory
 - E. Deterrence theory
- 33. Which of the following is the most common intracranial complication of cocaine use?**
- A. Non-haemorrhagic infarct
 - B. Transient ischaemic attack (TIA)
 - C. Subarachnoid haemorrhage
 - D. Intraventricular haemorrhage
 - E. Intraparenchymal haemorrhage
- 34. Chris and Ken are classmates at the local primary school. Chris's father has problems related to alcohol use, while Ken's parents are teetotal. How many times is Chris more likely to develop an alcohol-related problem in later life than Ken, assuming other psychosocial factors are comparable?**
- A. 2–3 times
 - B. 4–10 times
 - C. 10–20 times
 - D. 20–40 times
 - E. 100 times
- 35. Which of the following is the most common lifetime comorbid diagnosis in a person with cocaine dependence?**
- A. Alcohol use disorder
 - B. Depression
 - C. Antisocial personality disorder
 - D. Phobia
 - E. Schizophrenia

36. Which of the following is a factor that can increase the risk of benzodiazepine withdrawal in a clinical setting?

- A. Gradual tapering of the prescribed drug
- B. Shorter duration of exposure
- C. Low level of psychopathology before initiation of benzodiazepine D treatment
- D. Low level of educational attainment
- E. Low dose of the prescribed drug

37. Which of the following is NOT a feature of alcoholic hallucinosis?

- A. Clear consciousness
- B. Autonomic hyperactivity
- C. Third-person hallucinations
- D. Secondary delusions
- E. Good prognosis compared with other psychoses

38. An 18-year-old boy was brought to the A&E by police after being picked up wandering near Tower Bridge. He was angry, agitated, and suspicious. He was concerned about people trying to 'get him'. On examination, he showed evidence of stereotyped behaviour, tachycardia, pupillary dilation and elevated blood pressure. Soon after initial evaluation, he developed seizures. What is the most likely substance that may have led to this presentation?

- A. Alcohol
- B. Cannabis
- C. Heroin
- D. Amphetamine
- E. Inhalant

39. Cocaine intake is associated with all of the following phenomena except

- A. Dopamine reuptake inhibition
- B. Serotonin reuptake inhibition
- C. Noradrenaline reuptake inhibition
- D. Corticotrophin releasing hormone secretion
- E. Prolactin release

40. Martin has been admitted to the addictions unit to undergo detoxification from opiates. He has been known to suffer from low blood pressure. Which of the following would be the best agent to treat his withdrawal symptoms?

- A. Buprenorphine
- B. Naloxone
- C. Clonidine
- D. Dihydrocodeine
- E. Lofexidine

41. Tolerance doesn't develop to which of the following symptoms/signs in opiate dependence?

- A. Sedation
- B. Euphoria
- C. Constipation
- D. Miosis
- E. Insomnia

42. Donna is an active opiate user, who recently found out that she is pregnant. She approaches her GP saying she wants to stop her substance use and is not considering maintenance therapy with methadone. She is worried about withdrawal symptoms. Her GP calls you about the best time for Donna to undergo opiate withdrawal during pregnancy. Which of the following is the most appropriate answer?

- A. First trimester
- B. Second trimester
- C. Third trimester
- D. Any of the above
- E. Withdrawal should never be considered during pregnancy

43. Which of the following symptoms is NOT found in opiate withdrawal?

- A. Abdominal pain
- B. Dry eyes
- C. Dilated pupils
- D. Vomiting
- E. Sweating

44. Which of the following treatments for opioid dependence has been shown to reduce risk-taking behaviours associated with HIV transmission?

- A. Naltrexone use
- B. Methadone maintenance
- C. Narcotics anonymous programme
- D. Antidepressant treatment
- E. Oral morphine prescription

45. The half life of methadone in a patient with opioid dependence is

- A. 4–6 hours
- B. 10–20 hours
- C. 24–36 hours
- D. 72–90 hours
- E. None of the above

46. Which of the receptors is implicated in the respiratory depressant action of opioids?

- A. Mu
- B. Kappa
- C. Delta
- D. Sigma
- E. ORL1

47. What is the equivalent dose of methadone for 0.5 g of street heroin?

- A. 5–15 mL of 1 mg/mL mixture
- B. 10–20 mL of 1 mg/mL mixture
- C. 30–40 mL of 1 mg/mL mixture
- D. 80–100 mL of 1 mg/ml mixture
- E. 1–2 mL of 1mg/mL mixture

48. Amotivational syndrome has been described with the use of which of the following substance?

- A. Cocaine
- B. Amphetamine
- C. Cannabis
- D. Alcohol
- E. LSD

49. Maternal smoking during pregnancy has been best associated with which of the following?

- A. Learning disability
- B. Autistic spectrum disorder
- C. Conduct disorder
- D. Autism
- E. Mood disorders

50. Following recent consumption of LSD, it can be detected in urine for up to

- A. 24 hours
- B. 1–3 days
- C. 10–15 days
- D. 15–30 days
- E. More than 30 days

1.C. According to Jellinek, drinking behaviour is heterogeneous. He described five species of alcoholism. Type *alpha* represents a purely habitual use without loss of control. A person with alpha alcoholism retains the ability to abstain. Type *beta* refers to development of physical complications without physical or psychological dependence. Type *gamma* represents acquired tissue tolerance leading to physical dependence and loss of control. They still maintain the ability to abstain if necessary. Type *delta* shares the three features of gamma, but the inability to abstain becomes prominent. Type *epsilon* refers to dipsomania or periodic alcoholism. More recently, various investigators have come up with different classifications, which overlap each other.

Murray R, et al, eds. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 198.
Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 397.

2.E. In 1976, Edwards and Gross proposed that not all people who drink too much are dependent on alcohol. They suggested the criteria for an alcohol dependence syndrome. This model forms the basis for the current ICD-10 classification. They noted that dependence was not an 'all or none' phenomenon, but lay on a spectrum of severity. The criteria were based on the clinical observation that some of the heavy drinkers manifested an interrelated clustering of signs and symptoms. The criteria are narrowing of repertoire; salience of drinking; increased tolerance to alcohol; withdrawal symptoms; relief drinking; subjective awareness of compulsion to drink; reinstatement after abstinence. Not all the elements need always be present, nor always present with the same intensity.

Murray RM, et al. *Essential Psychiatry*, 4th edn. Cambridge University Press; 2008, p. 198.

3.A. ICD-10 includes six items under dependence, most of which are similar to DSM-IV. For a diagnosis of dependence, three or more items should have occurred in the past year. The 'strong desire or sense of compulsion to take the substance' is viewed as a central descriptive characteristic of dependence in ICD-10. This compulsive-use indicator is not included in the concept of dependence described by DSM-IV. DSM-IV also allows categorization of substance dependence with or without physiological dependence depending on the presence of tolerance and withdrawal symptoms.

Gelder MG, et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 485.

4.A. Alcohol dependence occurs in 15–20% of hospitalized patients in some settings. Hence withdrawal from alcohol is also a common presentation in this population. Withdrawal symptoms are minor in most cases, but they can be considerable and even fatal in some. Alcohol withdrawal delirium, commonly known as delirium tremens or ‘DTs’, is the most serious manifestation of alcohol withdrawal syndrome. Classic studies quote a mortality of around 15%, but with advances in treatment, mortality rates have fallen, and more recent studies indicate a mortality of 0 to 1% in treated cases.

Mayo-Smith MF, Beecher LH, Fischer TL, et al. Management of alcohol withdrawal delirium: an evidence-based practice guideline. *Archives of Internal Medicine* 2004; **164**: 1405–1412.

5.C. Clinical features of alcohol withdrawal syndrome can appear within hours of the last drink (usually 6–12 hours) but alcohol withdrawal delirium typically does not develop until 2–3 days after cessation of drinking. Delirium tremens usually lasts 48–72 hours, but can last longer in some cases. Current diagnostic criteria for withdrawal delirium include disturbance of consciousness, change in cognition or perceptual disturbance developing in a short period, and the emergence of symptoms during or shortly after withdrawal from heavy alcohol intake. The classic clinical presentation also includes hyperpyrexia, tachycardia, hypertension, and diaphoresis. The neurobiological basis for withdrawal is a gradual upregulation of N-methyl-D-aspartate receptors under the influence of chronic alcohol use.

Mayo-Smith MF, Beecher LH, Fischer TL, et al. Management of alcohol withdrawal delirium: an evidence-based practice guideline. *Archives of Internal Medicine* 2004; **164**: 1405–1412.

6.E. This question looks at the possible differential diagnoses in a case of alcohol-related seizure. All the given choices are results of laboratory investigations that may give us a clue of the possible cause for the seizure. Electrolyte imbalance, hypoglycaemia, subdural haematoma, and other substances in blood may be associated with an alcohol-induced seizure. EEG is useful in the setting of the first alcohol withdrawal seizure or where epilepsy is suspected, but not immediately after a seizure when a record of slow delta activity is found whatever the cause of the seizure. However, the inter-ictal EEG is usually within normal limits in alcohol withdrawal seizures, whereas a generalized spike and wave (epileptiform activity) patterns on the EEG points towards generalized epilepsy. Alcohol-related seizures do not predispose to epilepsy.

McKeon A, Frye MA and Delanty N. The alcohol withdrawal syndrome. *Journal of Neurology, Neurosurgery, and Psychiatry* 2008; **79**: 854–862.

7.C. Benzodiazepines are the first-line treatment in alcohol withdrawal seizures. Lorazepam has been found to be superior to placebo in double-blind placebo-controlled studies of patients with chronic alcohol abuse presenting with a generalized seizure. The European treatment guidelines recommend either diazepam or lorazepam, although lorazepam is recommended over diazepam in the setting of status epilepticus. This is because lorazepam (although it has a shorter half-life than diazepam) maintains a steady plasma state for a longer time than diazepam, which is lipid soluble. The plasma levels of diazepam drop rapidly due to redistribution to fat. Placebo-controlled trials have demonstrated phenytoin to be ineffective in the secondary prevention of alcohol withdrawal seizures.

McKeon A, Frye MA and Delanty N. The alcohol withdrawal syndrome. *Journal of Neurology, Neurosurgery, and Psychiatry* 2008; **79**: 854–862.

8.D. General guidelines on the management of alcohol withdrawal advise against the use of neuroleptic agents as the sole pharmacological agents in the setting of delirium tremens, as they are associated with a longer duration of delirium, higher complication rate, and, ultimately, a higher mortality. However, neuroleptic agents have a role as a selected adjunct to benzodiazepines when agitation, thought disorder, or perceptual disturbances are not sufficiently controlled by benzodiazepines. Although haloperidol is well established in this setting, chlorpromazine is contraindicated as it is more epileptogenic. There is little information available on atypical antipsychotics in this regard.

Mayo-Smith MF, Beecher LH, Fischer TL, et al. Management of alcohol withdrawal delirium. An evidence-based practice guideline. *Archives of Internal Medicine* 2004; **164**: 1405–1412.

McKeon A, Frye MA and Delanty N. The alcohol withdrawal syndrome. *Journal of Neurology, Neurosurgery, and Psychiatry* 2008; **79**: 854–862.

9.C. Failure to identify or consider Wernicke's encephalopathy, and failure to institute adequate thiamine replacement therapy, has an associated mortality of 20%. Wernicke's encephalopathy is an acute neuropsychiatric condition associated with biochemical brain lesion caused by the depletion of intracellular thiamine (vitamin B1). Although reversible in the early stages, continued depletion leads to cellular energy deficit, focal acidosis, regional increase in glutamate, and ultimately cell death. Ninety per cent of the cases in developed countries are associated with alcohol misuse. This deficiency may be due to dietary deficiency, reduced absorption, and the increased excretion of thiamine seen in alcohol users. Clinical features include delirium with prominent anterograde amnesia, ataxia, and ophthalmoplegia. Imaging may reveal the presence of small haemorrhages in mamillary bodies and thalamus.

Thomson AD and Marshall EJ. The natural history and pathophysiology of Wernicke's encephalopathy and Korsakoff's psychosis. *Alcohol Alcohol* 2006; **41**: 151–158.

10.E. Seventy-five per cent of cases with Wernicke's encephalopathy will be left with permanent brain damage involving severe short-term memory loss (Korsakoff's dementia) if adequate parenteral therapy with thiamine is not instituted. In clinical practice, Wernicke's encephalopathy may be difficult to recognize because all the classic symptoms may not be present. In addition, the symptoms may be coloured by the presence of other comorbidities such as withdrawal delirium or seizures. Some authors also suggest the presence of a subsyndromal version of the encephalopathy that may present only with minor symptoms and neuroimaging findings. Twenty-five per cent of patients with Korsakoff's dementia will require long-term institutionalization.

Thomson AD and Marshall EJ. The natural history and pathophysiology of Wernicke's Encephalopathy and Korsakoff's Psychosis. *Alcohol Alcohol* 2006; **41**: 151–8.

11.C. Risk factors for developing Wernicke's encephalopathy include a greater degree of malnutrition and severity of alcohol misuse. Oral thiamine hydrochloride cannot be relied on to provide adequate thiamine to patients at risk. This is because studies show that only a maximum of 4.5 mg of thiamine will be absorbed from an oral dose over 30 mg. In addition, patients with alcohol problems tend to have poor absorption. Therefore, intravenous delivery of high-potency B-complex vitamin therapy containing thiamine remains the standard of care for those patients with suspected Wernicke's encephalopathy (500 mg of thiamine three times daily for three days), or who are at risk for Wernicke's encephalopathy (250 mg three times daily for 3–5 days). In the outpatient setting, the administration of a course of intramuscular thiamine 200 mg for 5 days has been recommended because the absorption of thiamine is negated further by continued drinking after hospital discharge.

Thomson AD, Cook CC, Touquet R, et al. The Royal College of Physicians report on alcohol: guidelines for managing Wernicke's encephalopathy in the Accident and Emergency Department. *Alcohol Alcohol* 2002; **37**: 513–521.

12.B. Up to 40% of people with an alcohol use disorder attempt suicide at some time and 7% end their lives by committing suicide. Risk factors include being male, older than 50 years of age, living alone, being unemployed, poor social support, interpersonal losses, continued drinking, consumption of a greater amount of alcohol when drinking, a recent alcohol binge, previous alcohol treatment, a family history of alcoholism, a history of comorbid substance abuse (especially cocaine), a major depressive episode, serious medical illness, and prior suicidal behaviour. Suicidal behaviour is especially frequent in patients with comorbid alcoholism and major depression.

Sher L. Risk and protective factors for suicide in patients with alcoholism. *Scientific World Journal* 2006; **6**: 1405–1411.

13.A. Alcohol use disorder co-occurs with other major mental illnesses. The Epidemiology Catchment Area Study reported a 13.8% lifetime prevalence for alcohol abuse or dependence in persons with bipolar I disorder in the US general population. Lifetime prevalence of alcohol abuse or dependence are: bipolar I, 46.2%; bipolar II, 39.2%; schizophrenia, 33.7%; panic disorder, 28.7%; unipolar depression, 16.5%. Patients with mania had an odds ratio of 6.2 (highest) for co-occurring alcohol abuse and/or dependence. Considering the degree of psychiatric comorbidity among alcohol-dependent individuals, the National Comorbidity Survey showed that the odds ratio (OR) of having co-occurring lifetime diagnosis of mania in patients with a lifetime diagnosis of alcohol dependence was higher in both men (OR = 12.03) and women (OR = 5.3).

Regier DA, Farmer ME, Rae DS, et al. Comorbidity of mental disorders with alcohol and other drug abuse. Results from the Epidemiologic Catchment Area (ECA) Study. *Journal of the American Medical Association* 1990; **264**: 2511–2518.

Kessler RC, Crum RM, Warner LA, et al. Lifetime co-occurrence of DSM-III-R alcohol abuse and dependence with other psychiatric disorders in the National Comorbidity Survey. *Archives of General Psychiatry* 1997; **54**: 313–321.

Fan AH FM, Masseling SJ, et al. Increased suicidality in mania complicated by alcoholism. *Psychiatry and Clinical Neuroscience* 2007; **4**: 34–39.

14.C. This question can be answered using results from a study called Project MATCH (Matching Alcoholism Treatments to Client Heterogeneity). MATCH is one of the largest randomized trials to have examined psychosocial interventions for people with alcohol-related problems. The study is a multicentric study that involved randomizing over 1700 patients to MET, CBT, or TSF. This study demonstrated that four sessions of MET were as effective for treating alcohol dependence as 12 sessions of CBT or TSF therapy. The benefits from treatment persisted for up to 3 years. Clients with a higher degree of baseline anger fared better with MET than CBT or TSF. MET was found to be more cost-effective than CBT or TSF.

The Project MATCH study and smaller patient-matching studies provide support for the effectiveness of TSF programmes. Patients in Project MATCH who received outpatient TSF were most likely to abstain from alcohol during the first post-treatment year. TSF therapy led to a greater length of time before the patient's first relapse and to a higher percentage of abstinent patients at 1- and 3-year follow-up. Patients in Project MATCH with social networks supportive of not drinking responded better to TSF than MET, and that participation in AA was a mediator of this effect. Project MATCH found that patients who were rated high in 'meaning-seeking' fared better with TSF than CBT and MET at 1-year follow-up.

Tyler P and Silk KR. *Cambridge Textbook of Effective Treatments in Psychiatry*, 1st edn. Cambridge University Press; 2008, p. 274.

15.A. Brief interventions are recommended for reduction of alcohol use for patients across age and gender who are heavy or problem drinkers and do not meet the criteria for severe alcohol dependence. Brief interventions are intended to be conducted by health professionals who usually are not involved in addiction treatment, e.g. clinicians in general medical and other primary care settings. Brief interventions may differ in intensity from a single 5-minute session of simple advice to stop drinking to multiple sessions lasting up to 60 minutes each. They generally consist of four or fewer visits. They are generally useful for the prevention of alcohol-related problems in patients who are at risk of developing them. They are not primarily used as a maintenance therapy for fully fledged alcohol use disorders like dependence. The content of brief interventions can be remembered using the acronym FRAMES developed by Miller and Rollnick: feedback about the adverse effects of alcohol; emphasis on personal responsibility for changing the dysfunctional behaviour; advice about reducing or abstaining from the behaviour; a menu of options for further help; empathic stance towards the patient; and an emphasis on self-efficacy.

Gelder MG et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 270.

16.C. In the United Kingdom, a unit is 8 grams of pure alcohol, equivalent to half a pint of ordinary beer, a small glass of wine (9% strength), or one measure of spirits. In the USA a single drink is usually considered to contain about 12 grams of ethanol, which is the content of 12 ounces of beer, one 4-ounce glass of non-fortified wine, or 1–1.5 ounces of 40% ethanol liquor (e.g. whiskey or gin). Using moderate sizes of drinks, clinicians estimate that a single 'drink' (1.5 units) increases the blood alcohol level of a 150-pound man by 15–20 mg/dL, which is about the concentration of alcohol that an average person can metabolize in 1 hour.

Murray RM, Kendler KS, McGuffin P, et al. *Essential Psychiatry*, 4th edn. Cambridge University Press, 2008, p. 199.

17.C. Nearly 90% of alcohol is absorbed from small intestine, with the remaining 10% absorbed from the stomach. Alcohol reaches peak blood concentration approximately 45–60 minutes after consumption. Absorption is enhanced by an empty stomach whereas food delays absorption. When the alcohol concentration in the stomach becomes too high, gastric mucus secretion increases, leading to closure of the pyloric valve. This pylorospasm slows down the absorption and protects from rapid intoxication but can lead to vomiting and nausea in drinkers.

The intoxicating effects are greater when the blood alcohol concentration is rising than when it is falling; this is called the Mellanby effect. As a result, the rate of absorption directly affects the intoxication response. Nearly 90% of absorbed alcohol is metabolized through oxidation in the liver; the remainder is excreted unchanged by the kidneys and lungs. The rate of oxidation by the liver is constant (15 mg/dL per hour) and independent of plasma alcohol levels; thus alcohol follows zero-order elimination kinetics. Women have a tendency to become more intoxicated than men after drinking the same amount of alcohol; this may be due to differences in absorption kinetics and a lower level of metabolic enzymes such as alcohol dehydrogenase (ADH) in women.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 393.

18.A. AUDIT is a 10-item questionnaire, covering quantity, frequency, inability to control drinking, withdrawal relief, loss of memory, injury, and concern by others. A score of 8 or more indicates that the person is drinking to a degree that is harmful or hazardous, whereas a score of 13 or more in women and 15 or more in men is indicative of dependent drinking. It is a very useful and widely used scale. The CAGE questionnaire is a simple, easily administered instrument that has only four items. A positive answer should raise suspicion of an alcohol problem, and a score of 2 is highly suggestive of one. It takes 30–120 seconds to administer. Aertgeerts *et al* studied alcohol screening instruments used in general practice. They found that CAGE was an insufficient screening instrument for detecting alcohol misuse or dependence among primary care patients with only 62% sensitivity for males and 54% for females. AUDIT was found to be more effective, with a sensitivity of 83% among males and 65% among females. However, this was using a cut off-point of 5 rather than the usual 8. The study also found that conventional laboratory tests are of no use for detecting alcohol abuse or dependence in a primary care setting. MAST is the Michigan alcohol screening test and the other options in the question are laboratory-based blood tests.

Aertgeerts B, Buntinx F, Ansoms S and Fevery J. (2001) Screening properties of questionnaires and laboratory tests for the detection of alcohol abuse or dependence in a general practice population. *British Journal of General Practice* **51**: 206–217.

19.A. Alcohol-related blackouts are similar to episodes of transient global amnesia; they occur as discrete episodes of anterograde amnesia in association with alcohol intoxication. Despite a specific short-term memory deficit (inability to recall events that happened in the previous 5–10 minutes) during the blackouts and significant subjective distress that follows, patients have relatively intact remote memory and can perform complicated tasks during a blackout. Thus they appear completely normal to casual observers. It is thought that alcohol blocks the consolidation of new memories into old memories via its action on medial temporal structures. Binge drinkers may be particularly prone to alcoholic blackouts due to repeated intoxications. Although amnesia may accompany withdrawal or intoxication-related generalized seizures, not all blackouts are associated with epileptic activity in EEG.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 400.

20.A. Children with FAS commonly present with microcephaly rather than macrocephaly. It is well documented that alcohol and its metabolite acetaldehyde can have serious effects on the developing foetus. Currently, the estimated incidence of FAS is between 1 and 3 cases per 1000 live births. It is one of the most frequent causes of birth defects associated with learning disability, and the most common of non-hereditary causes of birth defects. Clinical features of FAS include prenatal and postnatal growth retardation, central nervous system abnormalities, usually with learning disability (up to severe), a characteristic facial dysmorphism (e.g., absent philtrum, flattened nasal bridge, short palpebral fissures, epicanthic folds, and maxillary hypoplasia), and an array of other birth defects such as microcephaly, altered palmar creases, short stature, syndactyly, atrial septal defect and other heart abnormalities. Full-blown foetal alcohol syndrome is seen in the offspring of approximately one-third of alcoholic women drinking the equivalent of 10–15 units daily. It is also more common in women who binge drink.

Lowinson JH, Ruiz P, Millman RB and Langrod JG. *Substance Abuse: A Comprehensive Textbook*, 4th edn. Lippincott Williams & Wilkins, 2005, p. 1052.

21.C. Sedative-hypnotic (includes benzodiazepines, barbiturates and newer 'z' hypnotics) withdrawal syndrome is a spectrum of signs and symptoms that occurs after stopping daily intake of a sedative-hypnotic. Common signs and symptoms include anxiety, tremors, nightmares, insomnia, anorexia, nausea, vomiting, postural hypotension, seizures, delirium, and hyperpyrexia. The withdrawal syndrome is similar for all sedative-hypnotics, but the severity and time course depend on the pharmacokinetics of the individual agent used, besides a number of other risk factors. With short-acting medication, withdrawal symptoms typically begin 12–24 hours after the last dose and peak in intensity between 24 and 72 hours after the last dose. If the patient has liver disease or is over the age of 65, symptoms may develop more slowly. With long-acting medication, the withdrawal syndrome usually begins 24 to 48 hours after the last dose and peaks on the fifth to eighth day. During untreated sedative-hypnotic withdrawal, the EEG may show bursts of *high-voltage, low-frequency activity*. This may precede a clinical seizure occasionally.

Lowinson JH, Ruiz P, Millman RB and Langrod JG. *Substance Abuse: A Comprehensive Textbook*, 4th edn. Lippincott Williams & Wilkins, 2005, p. 307.

22.A. ADH (alcohol dehydrogenase) and ALDH (aldehyde dehydrogenase) are the major enzymes involved in the degradation of ethanol; ADH catabolizes alcohol to acetaldehyde, which ALDH breaks down to acetate and water. A number of studies have shown that allelic variants of ADH and ALDH are associated with the risk for developing alcohol dependence. There are many ALDH gene families distributed on several different chromosomes. Family 2 genes (ALDH 2) located on chromosome 12 have been studied the most regarding an association with alcohol dependence. This family of genes encodes mitochondrial enzymes that oxidize acetaldehyde. ALDH 2 has an allelic variant called ALDH 2*2. This ALDH 2*2 variant is found in approximately 50% of the Asian population. Individuals with the ALDH 2*2 variant typically experience a disulfiram-like reaction when they take alcohol. This is sometimes called the 'Asian flush' or the 'Oriental flush syndrome'. Several studies demonstrate the protective effect of ALDH 2*2 gene carriers from developing alcohol dependence. The other genes ALDH1, 3, 4 and 5 are responsible for the metabolism of other aldehydes in the body. Similarly a variant allele of the ADH gene (situated on chromosome 4) ADH 2*2 also confers protection to alcoholism, although this relationship is less robust than ALDH2*2.

Lowinson JH, Ruiz P, Millman RB and Langrod JG. *Substance Abuse: A Comprehensive Textbook*, 4th edn. Lippincott Williams & Wilkins, 2005, p. 37.

23.C. About 30–40% of people with an alcohol-related disorder meet the diagnostic criteria for a major depressive disorder sometime during their lifetime. It is more common in women. It is dose dependent, i.e. it is likely to occur in patients who have a high daily consumption of alcohol. It is also more common in those with a family history of alcohol abuse. Patients with depression and comorbid alcohol use disorders are at a greater risk for attempting/completing suicide and are likely to have other substance-related disorder diagnoses. Most estimates of the prevalence of suicide among people with alcohol-related disorders range from 10–15%, although alcohol use itself may be involved in a much higher percentage of suicides. Twenty to 50 percent of all people with alcohol-related disorders also meet the diagnostic criteria for an anxiety disorder. Phobias and panic disorder are particularly frequent comorbid diagnoses in patients with alcohol use disorders.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams and Wilkins, 2007, p. 392.

24.E. Acamprosate's principal neurochemical effects have been attributed to antagonism of NMDA glutamate receptors, which restores the balance between excitatory and inhibitory neurotransmission that is dysregulated following chronic alcohol consumption. Recently, however, further mechanisms have been demonstrated. Thus acamprosate is said to have four principal effects: A) reducing post-synaptic excitatory amino acid neurotransmission at N-methyl-D-aspartate (NMDA); B) diminishing Ca^{2+} influx into the cell, which interferes with expression of the immediate early gene *c-fos*; C) decreasing the sensitivity of voltage-gated calcium channels, and D) modulating metabotropic-5 glutamate receptors (mGluR5). The most common side effects are headache, diarrhoea, flatulence, abdominal pain, paraesthesia, and various skin reactions. Acamprosate is not metabolised by liver and is excreted unchanged by the kidney. Administration of disulfiram or diazepam does not affect the pharmacokinetics of acamprosate. Coadministration of naltrexone with acamprosate produces an increase in concentrations of acamprosate. Effect of acamprosate is dose dependent and has been confirmed by at least two studies in humans.

Johnson BA. Update on neuropharmacological treatments for alcoholism: scientific basis and clinical findings. *Biochemical Pharmacology* 2008; **75**: 34–56.

Pelc I, Verbanck P, Le Bon O, et al. Efficacy and safety of acamprosate in the treatment of detoxified alcohol-dependent patients. A 90-day placebo-controlled dose-finding study. *British Journal of Psychiatry* 1997; **171**: 73–77.

25.D. Disulfiram inhibits aldehyde dehydrogenase producing a marked increase in blood acetaldehyde concentration if alcohol is consumed. The accumulation of acetaldehyde produces a wide array of unpleasant reactions, called the disulfiram–ethanol reaction, characterized by nausea, throbbing headache, vomiting, hypertension, flushing, sweating, thirst, dyspnoea, tachycardia, chest pain, vertigo, and blurred vision. The reaction occurs almost immediately after the ingestion of one alcoholic drink and can last from 30 minutes to 2 hours. A person taking disulfiram must be instructed that the ingestion/use of any quantity of alcohol (including alcohol-containing preparations of medicines, food, and cosmetics) would lead to the unpleasant reaction with dangerous consequences at times. Disulfiram should not be administered until the person has abstained from alcohol for at least 12 hours. This reaction can occur as long as 1–2 weeks after the last dose of disulfiram.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 1038.

26.C. Learned tolerance refers to a reduction in the effects of a drug because of compensatory mechanisms that are acquired by past experiences. One type of learned tolerance is called *behavioural tolerance*. This simply describes the skills that can be developed through repeated experiences of attempting to function despite a state of mild to moderate intoxication. A common example is learning to walk in a straight line despite the motor impairment produced by alcohol intoxication. This probably involves both acquisition of motor skills and the learned awareness of one's deficit, causing the person to walk more carefully. At higher levels of intoxication, behavioural tolerance is overcome, and the deficits are obvious. Pharmacokinetic, or dispositional, tolerance refers to changes in the distribution or metabolism of a drug after repeated administrations such that a given dose produces a lower blood concentration than the same dose did on initial exposure. This may be mediated via enzyme induction. *Pharmacodynamic tolerance* refers to adaptive changes that have taken place within the systems affected by the drug so that the response to a given concentration of the drug is reduced, e.g. change in receptor density. *Conditioned tolerance* is the process where environmental cues, e.g. sight, smell, etc, for the substance will no longer produce a manifestation of the drug's effect. Reverse tolerance, or sensitization, refers to an increase in response with repetition of the same dose of the drug.

Zack M and Vogel-Sprott M. Behavioral tolerance and sensitization to alcohol in humans: the contribution of learning. *Experimental and Clinical Psychopharmacology* 1995; **3**: 396–401.

27.D. Miller and Rollnick (1991) described five principles that are essential to motivational interviewing. They are (1) express empathy: communicate acceptance, use reflective listening, and normalize a client's ambivalence; (2) develop discrepancy: increase the client's awareness of the consequences of the problematic behaviour, orient the client to the discrepancy between his/her current behaviour and goals in life, and have the client generate reasons for change; (3) avoid argumentation; (4) roll with resistance: invite the client to consider new points of view rather than having them imposed; and (5) support self-efficacy.

O'Donohue WT, Fisher JE and Hayes SC. *Cognitive Behavior Therapy: Applying Empirically Supported Techniques in Your Practice*. John Wiley & Sons; 2003, p. 252.

28.B. Although the occurrence of alcoholic hallucinosis has been noted for centuries, its nosological status is not yet clear. Little research regarding this has been published in recent years. Tsuang et al. (1994) reported a prevalence of 7.4% among patients in an alcohol treatment programme. Patients with alcoholic hallucinosis were younger at the onset of alcohol problems, consumed more alcohol per occasion, developed more alcohol-related life problems, had higher rates of drug experimentation, and used more of other drugs than alcohol users without hallucinosis. The severity of dependence increased the risk for hallucinosis. It is also noted that the prevalence of schizophrenia is higher in the families of index cases with alcoholic hallucinosis.

Tsuang JW, Irwin MR, Smith TL and Schuckit MA. Characteristics of men with alcoholic hallucinosis. *Addiction* 1994; **89**: 73–78.

Thirthalli J and Benegal V. Psychosis among substance users. *Current Opinions in Psychiatry* 19: 239–245.

29.B. Decreased D2 receptors in alcohol, cocaine, and methamphetamine users, whether premorbid or the consequence of substance use, in conjunction with a finding of increased salience to drug cues, indicate susceptibility to relapse in this population.

Chang L and Haning W. Insights from recent positron emission tomographic studies of drug abuse and dependence. *Current Opinions in Psychiatry* 19: 246–252.

30.B. Genetic and familial factors probably account for most cases of alcohol problems that begin in adulthood and continue through to older age. Late-onset cases are associated with much lower rates of family alcoholism. Compared with early-onset cases, late-onset problem drinkers also tend to have less psychopathology. In fact, the notion that late-onset alcohol dependence usually occurs secondary to a mood or organic mental disorder has not been upheld in recent systematic studies. The inability to cope with major losses, chronic psychosocial strains, or transient negative affects such as depression or loneliness, are associated with new or renewed problem drinking. The pathophysiological effects of alcohol may be more serious in elderly people because of an age-related increase in biological sensitivity to alcohol and in peak blood level following a standard alcohol load. In addition, alcohol also aggravates many pre-existing diseases that are more common in later life.

Gelder MG, et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 1638.

31.C. The stages of change model by Prochaska and DiClemente are stages that a person goes through when involved in a behavioural change. This may include a change in substance misuse behaviour, starting daily exercise, going on a diet, or changing a health-related behaviour, e.g. attempting to obtain a cervical smear. The first stage is the precontemplation stage, where the person is not thinking of any imminent change and is happy the way things are. The second stage is contemplation, where he is considering a change in the near future. Preparation is when he gets ready or prepares to enforce the behavioural change. The action phase is when he implements the change, and in the maintenance phase he decides to continue the change in behaviour and attempts to prevent relapse.

Thambirajah MS. *Psychological Basis of Psychiatry*. Elsevier, 2005, pp. 125–126.

32.E. Disulfiram is generally considered a deterrent. Earlier works suggested disulfiram to be an aversion treatment. The theory underlying 'aversion therapy' is that 'repeated pairing' of alcohol with an unpleasant stimulus leads to a conditioned response in which drinking alcohol is increasingly perceived as unpleasant. This was previously considered to be the case with disulfiram, because it was common practice to induce the highly unpleasant but controlled disulfiram–ethanol reaction in a clinical setting before initiating regular therapy. This is now considered unnecessary for the efficacy of disulfiram therapy, i.e. the 'unpleasant' outcome need not be experienced by the person, but a 'fear' of the possibility of such experience is sufficient. An analogy is with police cars. Brewer states that no sane driver will exceed the speed limit if he sees a police car in front or behind; one does not need to be arrested for speeding before reducing the speed. Most patients who take disulfiram under supervision do not risk drinking. Those who do drink do not necessarily get a significant reaction on standard doses of disulfiram, but if the experience is unpleasant, they do not usually repeat it. Some people may consider this as a form of negative reinforcement, which again needs the subject to experience the 'repeated conditioning' in order to increase the abstinence behaviour. So, from the given choices, deterrence theory would be the best choice. Deterrence is an established theme in criminal justice. It refers to reduction in unwanted behaviour through knowledge of costs and risks involved in an act.

Brewer C. Combining pharmacological antagonists and behavioural psychotherapy in treating addictions. Why it is effective but unpopular? *British Journal of Psychiatry* 1990; **157**: 34–40.

33.A. High doses of cocaine have been associated with a wide variety of toxic effects, including cardiac arrhythmias, coronary artery spasms, myocardial infarction, and myocarditis. Most of the complications are related to vasoconstriction. The most common cerebrovascular diseases associated with cocaine use are non-haemorrhagic cerebral infarctions. When haemorrhagic infarctions do occur, they can include subarachnoid, intraparenchymal, intraventricular, and at times spinal cord haemorrhages. Other toxic effects on the central nervous system may include seizures, hyperpyrexia, respiratory depression, and death. Cocaine-related seizures and loss of consciousness are seen in heavy users. Rhabdomyolysis, after large doses of cocaine, may contribute to renal complications. Sniffing cocaine can cause ulcers of the mucosa in the nose and perforation of the nasal septum from persistent vasoconstriction. Inhaled cocaine freebase is believed to induce lung damage. By producing placental vasoconstriction, cocaine may contribute to foetal anoxia.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2005, p. 1229.

34.B. Alcohol use disorders run in families. A child with an alcoholic parent has a 4- to 10-fold increased risk of developing alcoholism themselves. This can be due to both genetic and environmental factors. Environmental influences include the availability of alcohol, parental attitudes, and peer pressure. Starting to drink before the age of 15 years is associated with a fourfold increased risk for lifetime alcoholism compared with starting at the age of 21 years. Severe childhood stressors, especially emotional, physical, and sexual abuse, are associated with up to seven times increased risk of alcoholism in adulthood. Childhood antisocial behaviour predicts regular alcohol use in early adolescence and the development of alcoholism later on.

Enoch M. Genetic and environmental influences on the development of alcoholism: resilience vs. risk. *Annals of the New York Academy of Sciences* 2006; **1094**: 193–201.

35.A. Cocaine use is associated with frequent co-occurrence of other psychiatric disorders. The presence of other psychiatric disorders sharply increases the odds of substance dependence, and substance-dependent people are more likely than the general population to meet the diagnostic criteria for additional psychiatric disorders. Among cocaine users seeking treatment, the rates of additional current and lifetime diagnoses are regularly found to be elevated. The most common additional lifetime diagnoses associated with cocaine use are alcoholism (60%), antisocial personality (30%), and major depression (30%).

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2005, p. 1228.

36.D. Symptoms associated with the withdrawal of benzodiazepine therapy may reflect one of three phenomena – a recurrence (return of the original symptoms); a rebound (worsening of the original symptoms), or true withdrawal (emergence of new symptoms). These symptoms may include anxiety, dysphoria, irritability, altered sleep–wake cycle, daytime drowsiness, tachycardia, elevated blood pressure, hyperreflexia, muscle tension, agitation/motor restlessness, tremor, myoclonus, muscle and joint pain. Patients may also experience various perceptual disturbances such as hyperacusis, depersonalization, blurred vision, and hallucinations. In severe cases, delirium similar to delirium tremens has been reported. Factors influencing the development of the discontinuance or withdrawal syndrome include the dose of the drug, duration of the drug intake, rapid tapering of the dose and greater psychopathology before initiation and termination of medication, dependent personality traits, and lower education levels.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2005, p. 1311.

37.B. Alcoholic hallucinosis is a condition in which auditory hallucinations are present during clear consciousness in the absence of autonomic overactivity, usually in a person who has been drinking excessively for many years. Initially the hallucinations are simple in nature, but later on become complex voices that are derogatory. These voices are usually second person, but at times are third person. They may also be command hallucinations. Delusions, if present are secondary to the voice. In both ICD-10 and DSM-IV, the disorder is classified as a substance-induced psychotic disorder. The differential diagnosis includes withdrawal symptoms and delirium tremens. In both these conditions the auditory hallucinations are transient and disorganized, and in the latter, consciousness is impaired. Auditory hallucinations of alcoholic hallucinosis are persistent and organized, and occur during clear consciousness. The hallucinations usually respond rapidly to antipsychotic medication. The prognosis is good; usually the condition improves within days or a couple of weeks, provided that the person remains abstinent. Symptoms that last for 6 months generally continue for years. The other differential diagnosis one needs to rule out, especially in the presence of derogatory hallucinations, is major depression with psychotic symptoms.

Gelder MG, et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 490.

38.D. The features described in the clinical scenario are that of amphetamine intoxication. The clinching points are the sympathetic activity due to release of catecholamines and the stereotyped behaviour, which are characteristic of amphetamine use. According to DSM-IV, the diagnostic criteria for intoxication with amphetamine includes behavioural or psychological changes such as euphoria or affective blunting; changes in sociability; hypervigilance; interpersonal sensitivity; anxiety, tension, or anger; stereotyped behaviours; and impaired judgment. Physical symptoms/signs include tachycardia or bradycardia, pupillary dilation, elevated or lowered blood pressure, perspiration or chills with nausea or vomiting. Psychomotor changes include agitation or retardation. Patients may complain of muscular weakness, chest pain; some may develop cardiac arrhythmias and seizures.

Gelder MG, et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 531.

39.E. Cocaine inhibits the normal reuptake of monoamines from the synaptic cleft by binding to transporter proteins. Its reinforcing effects are primarily due to its actions at the dopamine transporter, producing high levels of dopamine in the synapse. Cocaine also inhibits reuptake of noradrenaline and serotonin. The increase in noradrenaline concentration is important for some of cocaine's toxic effects. The drug produces increases in adrenocorticotrophic hormone (ACTH) and cortisol by stimulating release of hypothalamic corticotropin-releasing hormone (CRH). Acutely, cocaine also stimulates the release of luteinizing hormone and follicle-stimulating hormone (FSH) and suppresses the release of prolactin.

Goldman D, Oroszi G and Ducci F. *The genetics of addictions: uncovering the genes*. Focus 2005; **4**: 401–415.

40.A. Buprenorphine is preferable to α_2 adrenergic agonists if there are concerns about bradycardia or hypotension. Buprenorphine results in lower severity of withdrawal symptoms than α_2 adrenergic agonists. Buprenorphine can be used for short-term opioid withdrawal and has a better outcome than clonidine. Methadone and α_2 adrenergic agonists (e.g. clonidine and lofexidine) also have a good evidence base for reducing withdrawal symptoms. If a short duration of treatment is desirable, α_2 adrenergic agonists are preferable to methadone. Methadone treatment is more successful if carried out slowly or with a linear dose reduction. Methadone can be used during pregnancy, and there are emerging studies regarding the use of buprenorphine. α_2 adrenergic agonists should not be prescribed in pregnancy.

Lingford-Hughes AR, Welch S, Nutt DJ. Evidence-based guidelines for the pharmacological management of substance misuse, addiction and comorbidity: recommendations from the British Association for Psychopharmacology. *Journal of Psychopharmacology* 2004; **18**: 293–335.

41.C. Recent research has shed new light on the mechanisms involved in the development of opioid tolerance and dependence. Stimulation of opioid receptors located on critical cells such as those located in the locus coeruleus produces a decrease in cell firing. This effect reflects cellular hyperpolarization that results from both the activation of potassium channels and the inhibition of slowly depolarizing sodium channels. These actions occur in conjunction with a decrease in intracellular cyclic adenosine monophosphate (cAMP) levels. Among the given choices, both constipation and miosis have been traditionally thought to be resistant to tolerance. Kollars and Larson reviewed the two studies conducted in the late 60s which are often quoted to show that miosis does not develop tolerance. They quote a number of other studies which have shown that miosis is susceptible to tolerance. There are comparatively few data refuting the lack of tolerance response for constipation. Clinical experience hints that constipation is a major problem that persists without development of tolerance, especially in elderly people who are prescribed opiates as analgesics. This can be very difficult to treat, at times requiring enemas and in severe cases requiring manual evacuation.

Kollars JP and Larson M. tolerance to miotic effects of opioids. *Anesthesiology*: 2005; **102**: 701.
Higgins S, Stitzer M, McCaul M, et al. Pupillary response to methadone challenge in heroin users. *Clinical Pharmacology and Therapeutics* 1985; **37**: 460–463.

42.B. The view of treatment of opiate dependence has changed over the past 25 years. Previously it was thought that all patients should undergo withdrawal prior to delivery. Current practice acknowledges the fact that an abstinence state is almost impossible to achieve in this population. Hence most experts now advocate methadone maintenance as a way to reduce illegal drug use and remove the woman from a hazardous drug-seeking environment. Current consensus is that undertaking a medical withdrawal regimen could be accomplished most safely during the second trimester, with careful monitoring of foetal welfare by perinatal experts. The consensus is that opiate withdrawal could be best accomplished through stabilization with methadone followed by gradual reduction of the methadone dosage by 2–2.5 mg every 7–10 days. This should ideally be done only in a secondary care setting with the involvement of obstetricians and neonatologists.

Lowinson JH, Ruiz P, Millman RB and Langrod JG. *Substance Abuse: A Comprehensive Textbook*, 4th edn. Lippincott Williams & Wilkins, 2005, p. 808.

43.B. Lacrimation – not dry eyes – is a symptom seen in opiate withdrawal. DSM-IV states that opiate withdrawal can be precipitated by cessation of (or reduction in) opioid use that has been heavy and prolonged (several weeks or longer) or administration of an opioid antagonist after a period of opioid use. Other symptoms typically associated with withdrawal are dysphoric mood, nausea or vomiting, muscle aches, rhinorrhoea, pupillary dilation, piloerection, sweating, diarrhoea, yawning, fever, and insomnia. Piloerection along with general ‘secretion’ from most of the glands is called the ‘cold turkey’, when people tend to detox without medical help.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 447.

44.B. Systematic reviews of methadone maintenance vs. non-opioid therapy conducted by the Cochrane collaboration shows that methadone has a superior retention rate than control conditions. Methadone maintenance treatment has also been shown to reduce risk behaviours (specifically reduction in needle sharing) and thereby has achieved a reduction in the transmission of HIV. Intake of illicit opioids decreased in the methadone maintenance group, as shown by fewer positive urine tests for 'morphine' in these groups. Although criminal activity was found to be less in the group that was on methadone maintenance, the statistics did not show a significant difference. Nevertheless, individual randomized controlled trials have shown that methadone maintenance decreases criminal activity. In addition, methadone maintenance has shown to decrease rates of suicide and overdose in this population.

Mattick RP, Breen C, Kimber J, et al. Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence. *Cochrane Database of Systematic Reviews* 2003, Issue 2. Art. No.: CD002209.

45.C. Elimination of most synthetic opioids is complex. The peak plasma concentrations of oral methadone are reached within 2–6 hours, and initially plasma half-life is 4–6 hours in opioid-naïve people and 24–36 hours after steady dosing of any type of opioid. It generally requires once-daily dosing. Methadone is highly protein bound and equilibrates widely throughout the body, which ensures little post-dosage variation in steady-state plasma concentrations. Methadone can be used for short-term detoxification (7–30 days), long-term detoxification (up to 180 days), and maintenance (treatment beyond 180 days) of opioid-dependent individuals. In contrast, the elimination of a sublingual dosage of buprenorphine occurs in two phases: an initial phase with a half-life of 3–5 hours and a terminal phase with a half-life of more than 24 hours. Buprenorphine dissociates from its receptor binding site slowly, which permits an every-other-day dosing schedule.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007; p. 1072.

46.A. Mu (MOP) receptors are found in the brain in the cortex, thalamus, striosomes, and periaqueductal grey. The Mu1 subtype is responsible for supraspinal analgesia and physical dependence. The Mu 2 subtype is responsible for respiratory depression, euphoria, constipation, physical dependence, and miosis. Kappa (KOP) receptors are found in the hypothalamus, claustrum, and periaqueductal grey regions of the brain and the substantia gelatinosa of the spinal cord. They are involved in spinal analgesia, sedation, miosis, and inhibition of ADH release. Delta (DOP) receptors are seen in the brain in the regions of the pons, amygdala, olfactory bulbs, and the deep cortex. Their function includes analgesia, euphoria, and physical dependence. Sigma receptors, which mediate the antitussive action, are no longer considered to be opioid receptors. A new receptor called ORL1 has recently been identified, with an endogenous ligand called nociceptin. The ORL1 receptors do not bind opioid peptides or opiate drugs. This system is widely distributed in the brain and spinal cord. Its activation produces hyperalgesia in most instances. Many do not consider ORL1 as an opiate receptor. The International Union of Basic and Clinical Pharmacology has recently agreed to rename mu, kappa, and delta to MOP, KOP and DOP receptors respectively.

Corbett AD, Henderson G, McKnight AT, Paterson SJ. 75 years of opioid research: the exciting but vain quest for the Holy Grail. *British Journal of Pharmacology* 2006; **147**: S153–162.

47.C. Assessing the methadone dose equivalent of reported street heroin use is difficult because of the reliance on self-report and the variable purity of illicit heroin. Broadly speaking, 30–40 mL of 1 mg/mL mixture is approximately equivalent to 0.5 g of street heroin.

Gelder mg et al., eds. *New Oxford Textbook of Psychiatry*. Oxford University Press, 2000, p. 527.

48.C. A controversial cannabis-related syndrome is amotivational syndrome. Whether the syndrome is related to cannabis use or reflects characterological traits in a subgroup of people regardless of cannabis use is under debate. Traditionally, amotivational syndrome has been associated with long-term heavy use and has been characterized by a person's unwillingness to persist in a task. Persons are described as becoming apathetic and anergic, and appearing indolent. Field studies of chronic heavy cannabis users in societies with a tradition of such use have not produced consistent evidence to demonstrate the existence of amotivational syndrome. Critics have questioned the methodological issues of the study. However, the possibility has been kept alive by reports that regular cannabis users experience a loss of ambition and impaired school and occupational performance.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 419.

49.C. Maternal smoking during pregnancy has been consistently associated with conduct disorder and delinquency and attention-deficit hyperactivity disorder (ADHD) in offspring during childhood and adolescence. This association has been found even after controlling for confounding variables such as socioeconomic status, maternal age, birth weight, and maternal psychopathology. This may be due to the effect of nicotine or may be genetically mediated. There may be other environmental risks that play a part in its development. More recent research has shown that the behavioural problems may not be a direct risk of smoking itself, but the presence of other genetic factors that may mediate the association between maternal smoking and conduct problems in children.

Button TM, Thapar A and McGuffin P. Relationship between antisocial behaviour, attention-deficit hyperactivity disorder and maternal prenatal smoking. *British Journal of Psychiatry* 2005; **187**: 155–160.

50.B. LSD and its metabolites are detectable in human urine for as long as 4 days after the ingestion of 0.2 mg of the drug. Amphetamines can be detected for 2–4 days; cocaine can be present for up to 3 days. Marijuana users may test positive in urine samples for up to 3 days after casual use; this can extend to up to 30 days for regular high-dose users.

Lowinson JH, Ruiz P, Millman RB and Langrod JG. *Substance Abuse: A Comprehensive Textbook*, 4th edn. Lippincott Williams & Wilkins, 2005, p. 572.

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chapter
6

**ORGANIC, LIAISON, AND
PERINATAL PSYCHIATRY**

QUESTIONS

- 1. A tumour in which of the following areas is most likely to lead to behavioural/psychiatric manifestation?**
 - A. Frontal lobe
 - B. Temporal lobe
 - C. Posterior fossa
 - D. Parietal lobe
 - E. Occipital lobe

- 2. Which of the following is least associated with a frontal lobe tumour?**
 - A. Decline in IQ
 - B. Dysexecutive syndrome
 - C. Disinhibition
 - D. Akinetic mutism
 - E. Manic syndrome

- 3. Factors affecting the presence of neuropsychiatric symptoms in head tumours include**
 - A. Site of lesion
 - B. Increased intracranial pressure
 - C. Rapidity of growth
 - D. Histopathology of the tumour
 - E. All of the above

- 4. Which of the following has been found to be effective in the treatment of pathological laughing and crying (PLAC) syndrome?**
 - A. Valproate
 - B. Moclobemide
 - C. Citalopram
 - D. Lithium
 - E. Thyroxine

5. **The lifetime prevalence of psychosis in patients suffering from epilepsy is around**
- A. 1–2%
 - B. 7–12%
 - C. 16–22%
 - D. 27–32%
 - E. 37–42%
6. **Which of the following is the most important factor in increasing the risk of suicide in epilepsy?**
- A. Presence of comorbid psychiatric disorder
 - B. Young male
 - C. Temporal lobe seizure
 - D. Greater duration of seizure disorder
 - E. Inadequate therapy
7. **Andrew is a 30-year-old man who presented with frontal headaches and a history of complex partial seizures. Typically, his seizures begin with 20 seconds of orobuccal movements followed by 40 seconds of altered consciousness. At seizure onset, Andrew feels he must constantly think of the word ‘Supercalifragilisticexpialidocious’ and repeat this several times without him being able to control it. What is this phenomenon called?**
- A. Forced thinking
 - B. Obsession
 - C. Compulsion
 - D. Forced normalization
 - E. Periodic lateralization
8. **The phenomenon where the onset of peri-ictal psychosis occurs as a result of control of epileptic seizures is called**
- A. Forced normalization
 - B. Forced thinking
 - C. Periodic lateralization
 - D. Twilight state
 - E. Geschwind syndrome
9. **Which of the following is NOT considered a feature of irritable bowel syndrome (IBS)?**
- A. Abdominal discomfort not relieved by defaecation
 - B. Altered stool frequency
 - C. Altered stool form
 - D. Altered stool passage
 - E. Passage of mucus

10. Which of the following is NOT a model that has been proposed to explain the relationship between IBS and high rates of psychiatric comorbidity?

- A. Somatization disorder hypothesis
- B. Somatopsychic hypothesis
- C. Psychogenic hypothesis
- D. Self-selection hypothesis
- E. Conversion hypothesis

11. Which of the following is a psychosocial risk factor for the development of peptic ulcer?

- A. History of major depressive disorder
- B. History of an anxiety disorder
- C. History of sexual abuse
- D. History of childhood neglect
- E. All of the above

12. Which of the following is NOT a risk factor for the development of peptic ulcer?

- A. Cigarette smoking
- B. Heavy alcohol consumption
- C. Lack of sleep
- D. Not eating breakfast
- E. High socioeconomic status

13. Which of the following is an early symptom/sign of HIV dementia?

- A. Forgetfulness
- B. Confusion
- C. Disorientation
- D. Slowing of verbal responses
- E. Carphologia

14. According to the WHO classification, the normal range of body mass index (BMI) is

- A. 16–18.50
- B. 18.50–24.99
- C. 25–29.99
- D. 30–34.99
- E. None of the above

15. Which of the following is considered the cardinal feature of delirium?

- A. Disturbance of sleep wake cycle
- B. Psychomotor disturbance
- C. Hallucinations
- D. Disturbance of consciousness
- E. Affective lability

16. Which of the following is a feature of systemic lupus erythematosus (SLE)?

- A. Late involvement of the central nervous system (CNS)
- B. CNS events strongly correlate with systemic disease activity
- C. Neuropsychiatric manifestations correlate with the presence of anticardiolipin antibodies
- D. 90% of the people diagnosed with SLE suffer from depression
- E. Stress has not been linked with exacerbation in SLE

17. Which of the following is a characteristic feature of paediatric autoimmune neuropsychiatric disorder due to group A streptococcal infection (PANDAS)?

- A. Arthritis
- B. Carditis
- C. Rheumatic fever
- D. Chorea
- E. Tics

18. Which of the following is the most common psychiatric manifestation of hyperthyroidism?

- A. Major depression
- B. Anxiety disorder
- C. Cognitive disorder
- D. Psychosis
- E. None of the above

**19. Which of the following is the most commonly reported psychiatric symptom in hypothyroidism?**

- A. Depression
- B. Cognitive disturbance
- C. Anxiety
- D. Psychosis
- E. None of the above

**20. Regarding corticosteroid-induced neuropsychiatric complications, which of the following statements is true?**

- A. Predominantly affective illness
- B. Severity of symptoms is dose related
- C. Complications tend to occur in the first 2 weeks of starting therapy
- D. Lithium prophylaxis is helpful
- E. All of the above

21. Which of the following is the most common psychiatric manifestation of Cushing's syndrome?

- A. Major depression
- B. Mania
- C. Anxiety disorder
- D. Psychosis
- E. Cognitive disorders

22. A 60-year-old woman who recently underwent radiation therapy to her neck presented with ‘painful bones, renal stones, abdominal groans, and psychic moans’. Which of the following condition is she most likely to be suffering from?

- A. Hyperparathyroidism
- B. Hypoparathyroidism
- C. Hyperthyroidism
- D. Hypothyroidism
- E. None of the above

23. The prevalence of major depressive disorder in patients with Huntington’s disease is around

- A. 1%
- B. 5%
- C. 15%
- D. 40%
- E. 80%

24. Which of the following is a feature of cognitive dysfunction in Huntington’s disease?

- A. Sparing of verbal recall
- B. Late-onset verbal memory and visuospatial dysfunction
- C. Sparing of procedural memory
- D. Early executive function loss
- E. Loss of speech comprehension before the loss of speech production

25. Which of the following is a feature of amnestic mild cognitive impairment (MCI)?

- A. Absence of subjective memory complaints
- B. Absence of memory impairment relative to age-matched healthy control
- C. Presence of evidence of clinical dementia
- D. Presence of difficulties in ADL
- E. Amyloid deposits and tau-positive tangles are seen more often in the mesial temporal lobes than in normal controls

26. Which of the following is a monogenic ischaemic stroke syndrome?

- A. CADASIL
- B. Moya Moya disease
- C. Reversible posterior leucoencephalopathy
- D. Binswanger’s disease
- E. Necrotizing arteritis

27. Which of the following is NOT a feature of Stage I Alzheimer's dementia?

- A. Memory impairment
- B. Visuospatial impairment
- C. Anomia
- D. Impairment in calculation
- E. Background slowing on EEG

28. Which of the following is NOT a feature of Binswanger's disease?

- A. Rapidly progressive dementia
- B. Clinical signs may include parkinsonian syndrome
- C. Fluctuating mental state is seen
- D. Deep white matter demyelination in periventricular areas
- E. Typically seen in chronic hypertensive patients

29. Which of the following is true regarding frontotemporal dementia (FTD)?

- A. Semantic dementia is the most common subtype
- B. The frontal variant is characterized by loss of word meaning and object recognition
- C. 40% of cases of FTD are familial autosomal dominant
- D. Pick bodies are immunoreactive to ubiquitin, but not to tau
- E. Pick's disease is the most common histological variant

30. HIV-induced cognitive deficits have been proposed to be due to

- A. Increased calcium-induced cell injury
- B. Altered brain glucose metabolism
- C. TNF-alpha-induced apoptosis
- D. NMDA-related excitotoxicity
- E. All of the above

31. Which of the following is the most common intracranial opportunistic infection in HIV?

- A. Toxoplasmosis
- B. Cryptococcosis
- C. Cytomegalovirus (CMV) infection
- D. Herpes simplex virus (HSV)
- E. Progressive multifocal leucoencephalitis

32. All of the following features of hyperactive delirium help differentiate it from hypoactive delirium, except

- A. Restlessness
- B. Hallucinations
- C. Fast EEG activity
- D. Better prognosis
- E. Increased speech

33. All of the following factors render a person at high risk for development of post-operative delirium except

- A. Baseline cognitive deficit
- B. Old age
- C. Multiple medication
- D. Emergency procedures
- E. High albumin

34. Which of the following medication used in elderly people has the least propensity to induce delirium?

- A. Digoxin
- B. Prednisolone
- C. Nifedipine
- D. Cimetidine
- E. Atenolol

35. All of the following are causes of diffuse slowing on EEG except

- A. Alcohol withdrawal delirium
- B. Post-traumatic delirium
- C. Anticholinergic delirium
- D. Hepatic encephalopathy delirium
- E. Hypoxic delirium

36. In children with PANDAS, which symptoms are least common?

- A. Obsessions
- B. Emotional lability
- C. Tics
- D. Separation anxiety
- E. Auditory hallucinations

37. Which is the most common site for the primary tumour in a metastatic brain cancer?

- A. Lung
- B. Breast
- C. Kidney
- D. Gastrointestinal tract (GIT)
- E. Prostate

38. A 40-year-old lady with multiple sclerosis (MS) was diagnosed with depression. She is on a number of medications for her MS. Of the following medication she is on, which is most likely to be associated with depressive symptoms?

- A. Gabapentin
- B. Amantadine
- C. Baclofen
- D. Interferon 1-beta
- E. None of the above

- 39. John is a 30-year-old man being treated for psychotic depression with selective serotonin uptake inhibitors (SSRIs) and antipsychotics. He takes an overdose of his medications and is admitted to the medical unit with features of tremor and hyperthermia. He does not know which medications he has taken. Which of the following points to a diagnosis of serotonin syndrome rather than neuroleptic malignant syndrome?**
- A. Myoclonus
 - B. 'Lead-pipe' muscle rigidity
 - C. Rhabdomyolysis
 - D. Elevated creatine phosphokinase (CPK)
 - E. Delirium
- 40. James was admitted to the medical unit following an attempt of deliberate self-harm (DSH). What percentage of people completes suicide within a year of the DSH attempt?**
- A. 1%
 - B. 10%
 - C. 20%
 - D. 30%
 - E. 40%
- 41. Which is the antipsychotic of choice for a 75-year-old man with Parkinson's disease who presented with psychotic symptoms?**
- A. Aripiprazole
 - B. Risperidone
 - C. Olanzapine
 - D. Quetiapine
 - E. Haloperidol
- 42. If a patient continues to take sodium valproate throughout her pregnancy what is the risk of the baby having a neural tube defect?**
- A. 0.05–0.1%
 - B. 1–2%
 - C. 10–20%
 - D. 20–30%
 - E. 30–40%
- 43. Which of the following is NOT a feature of chronic fatigue syndrome (CFS)?**
- A. Late insomnia
 - B. Severe unexplained fatigue not resolved by rest
 - C. Duration more than 6 months
 - D. Post-exertional malaise
 - E. Muscle aches and pains

44. Which antidepressant has got good evidence for its use in post-myocardial infarction depression?

- A. Fluoxetine
- B. Citalopram
- C. Reboxetine
- D. Mirtazapine
- E. Sertraline

45. Which of the following is the treatment of choice for premenstrual dysphoric disorder?

- A. SSRI
- B. Primrose oil
- C. Vitamin E
- D. Vitamin A
- E. St John's Wort

46. Mothers with anorexia nervosa are at high risk for having babies with

- A. Greater congenital malformations
- B. Larger birth weight
- C. Are born post term
- D. Macrocephaly
- E. Lower birth weight

47. The percentage of people with mental illness who were in contact with psychiatric services within 1 week of suicide is

- A. 10%
- B. 20%
- C. 30%
- D. 40%
- E. 50%

48. Which of the following is the best screening tool used in post-natal depression?

- A. Hamilton depression rating scale
- B. Edinburgh postnatal depression scale
- C. Montgomery Asberg depression rating scale
- D. Hospital anxiety and depression scale
- E. Beck's depression inventory

49. Which of the following is least associated with suicide?

- A. Depression
- B. Mania
- C. Schizophrenia
- D. Anxiety disorder
- E. Dementia

50. Maria suffered from postpartum blues during the immediate postpartum period, what is the chance that she develops postpartum depression?

- A. 1–5%
- B. 10–15%
- C. 20–25%
- D. 30–35%
- E. 40–45%

1.A. Frontal lobe tumours have been reported to be associated with psychiatric and behavioural symptoms in as much as 90% of cases. Frontal lobe tumours are associated with symptoms suggestive of mood disturbances and psychoses, including mania and hypomania, depression, catatonia, delusions, and hallucinations. Temporal lobe tumours cause psychiatric and behavioural symptoms in as much as 50–55% of the cases. Pituitary tumours cause psychiatric manifestations in as many as 60% of cases; parietal lobe – 15%; occipital lobe – 25%; and diencephalic tumours – 50%.

Kaplan HI. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004, p. 363.

2.A. Frontal lobe tumours do not generally cause a decline in IQ. Tumours of the frontal lobes tend to produce symptoms that reflect their anatomical locations. They usually interfere with frontally mediated executive functions. Tumours involving the anterior cingulate are associated with akinetic mutism. Tumours involving the dorsolateral prefrontal convexities are typically associated with apathy, abulia, lack of spontaneity, psychomotor retardation, reduced ability to plan ahead, motor impersistence, and impaired attention and concentration. Patients with orbitofrontal tumours often exhibit personality changes, irritability and mood lability, behavioural disinhibition and impulsivity, lack of insight, and poor judgement. Tumours of the ventral right frontal lobe are often associated with euphoria. Tumours of the left frontal lobe often cause decreased speech fluency and diminished verbal output, word-finding problems, and circumlocutory speech, whereas tumours affecting both frontal lobes are often associated with confabulation, Capgras' syndrome, or reduplicative paramnesia, or a combination of these.

Kaplan HI. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004, p. 363.

3.E. The anatomical location of a tumour is an important factor that predicts the development of neuropsychiatric problems in the population. For example, left temporal lobe tumours are most commonly associated with psychosis. To some extent, the symptoms represent the underlying function of the involved lobe. The aggressiveness of the tumour itself and the rapidity and extent of its spread are also believed to be important factors in the type, acuity, and severity of psychiatric and behavioural symptoms that may be associated with it. Thus, rapidly growing tumours are frequently associated with more acute psychiatric symptomatology, as well as significant neurocognitive impairment. In this case, raised intracranial tension is associated with rapid growth and hence more behavioural problems. In general, the specific histological characteristics of brain tumours have not been shown to be correlated with specific psychiatric and behavioural symptoms. However, as noted previously, more aggressive tumours, such as high-grade gliomas, are more likely to be associated with acute psychiatric and behavioural symptoms than are slower growing malignant and benign tumours.

Kaplan HI. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th ed. Lippincott Williams and Wilkins, 2004, p. 363.

4.C. Pathological emotions are characterized by episodes of laughing or crying, or both, that are not appropriate to the context. They may be spontaneous or triggered by non-emotional events. Pathological emotions have classically been explained as secondary to the bilateral interruption of descending neocortical upper motor neuron innervations of bulbar motor nuclei. Some patients with pathological emotions have bilateral lesions and pseudobulbar palsy, but others do not. Most recently, the frontopontocerebellar pathways have been implicated in the pathogenesis of pathological emotions. It is seen in about 15% of patients with stroke. Citalopram, as well as nortriptyline, have been found to be effective in the treatment of pathological crying after stroke in randomized placebo-controlled trials. In addition, post-stroke depression and PLAC appear to be independent phenomena, although they may coexist.

Kaplan HI. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004, p. 361.

5.B. Psychosis is the specific psychiatric disorder most clearly associated with epilepsy. The lifelong prevalence of all psychotic disorders among epileptic patients ranges from 7% to 12%. Patients whose epilepsy has a mediobasal temporal focus are especially at risk. Studies on the laterality of the seizure focus suggest an association of a left-sided focus with psychosis. Although conclusions derived from surface EEG recording are open to criticism, depth recordings of presurgical patients show that twice as many patients with left temporal lesions have psychosis.

Kaplan HI. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004, p. 379.

6.A. Suicide is increased fivefold among patients with epilepsy. Among patients presenting with self-harm, epileptic subjects are over-represented from five- to sevenfold. Risk factors for suicide in epilepsy are ranked as follows: (1) Comorbid psychiatric disorders (2) relatively young males (ages 25–49 years); (3) temporal lobe seizures (with brain lesions); (4) prolonged duration of the seizure disorder (5) inadequate therapy (6) personal, social, or occupational difficulties; and (7) availability of large amounts of antiepileptic drugs.

Trimble M and Schmitz B. *The Neuropsychiatry of Epilepsy*. Cambridge University Press, 2002, p. 108.

7.A. This type of psychic aura is called 'forced thinking,' characterized by recurrent intrusive thoughts, ideas, or crowding of thoughts. Forced thinking must be distinguished from obsessional thoughts and compulsive urges. Epileptic patients with forced thinking experience their thoughts as stereotypical, out-of-context, brief, and irrational, but not necessarily as ego dystonic. Periodic lateralizations are recurrent EEG complexes that may be associated with prolonged confusional behaviour and focal cognitive changes.

Kaplan HI. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004; p. 381.

8.A. Periictal psychotic symptoms more often worsen with increasing seizure activity. Rarely, psychotic symptoms alternate with seizure activity. In this 'alternating psychosis', as long as the patient's seizures are not controlled, they are free of psychotic symptoms, but when they are seizure free and their EEG has 'forced' or 'paradoxical normalization', they manifest psychotic symptoms. This alternating pattern is much less common than the increased emergence of psychotic behaviour with increasing seizure activity. Twilight states are episodes of confusion that may be associated with the seizure (ictal) or after a seizure (post ictal). They may be associated with odd behaviours, and the patient is usually not conscious about the behaviour. Geschwind syndrome is otherwise called epileptic personality. It consists of a cluster of personality traits including hyposexuality, hypergraphia, hyperviscosity, hyperreligiosity seen in patients with long-standing epilepsy.

Kaplan HI. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004 p. 382.

9.A. IBS is the prototypical functional gastrointestinal disorder characterized by abdominal pain and diarrhoea or constipation. The International Congress of Gastroenterology has developed a standardized set of criteria for IBS. They include either abdominal pain relieved by defaecation or associated with a change in frequency or consistency of stool; or disturbed defaecation involving two or more of the following: altered stool frequency; altered stool form hard or loose and watery; altered stool passage straining or urgency or feeling of incomplete evacuation; passage of mucus. IBS can be categorized into diarrhoea-predominant, constipation-predominant, and mixed subtypes. Medical treatment often targets the predominant symptom. IBS accounts for as much as 50% of all outpatient evaluations done by gastroenterologists.

Kaplan HI. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004 p. 2115.

10.E. Studies of psychiatric comorbidity in IBS estimate rates of comorbidity at 42–64% of all IBS patients. The exact mechanism for high rates of psychiatric comorbidity in IBS is unknown. Four models have been proposed to explain the relationship between IBS and high rates of psychiatric comorbidity. The first model is the somatization disorder hypothesis. This model classifies IBS as one of a group of diagnoses that can be made from a primary somatization disorder or other somatoform disorder. The somatopsychic hypothesis states that psychological symptoms are the result of chronic gastrointestinal distress and the unsatisfactory interaction with healthcare providers who do not accurately diagnose and treat IBS. Psychogenic hypothesis states that specific psychiatric disorders cause IBS for a significant proportion of patients. Panic disorder, in particular, is proposed as a cause for secondary IBS. The self-selection model proposes that psychiatric comorbidity increases the rate of treatment seeking in patients who have IBS.

Kaplan HI. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams and Wilkins, 2004 p. 2118.

11.E. Since the discovery of *Helicobacter pylori*, interest in the association of peptic ulcer and psychosocial factors has diminished. Nevertheless, psychosocial factors do play a role in the development of ulcers in susceptible individuals. Data from the National Comorbidity Survey have shown that generalized anxiety disorder (GAD) is associated with an increased risk of self-reported peptic ulcer disease. Longitudinal prospective studies have shown that depression and anxiety at baseline increase the risk of ulcer development. Childhood physical abuse, sexual abuse, and neglect are also associated with a statistically increased risk of peptic ulceration in addition to other physical conditions. Acute severe stress in human beings, provoked by wars or earthquakes, can precipitate ulceration in susceptible individuals. Once formed, psychosocial factors can delay recovery and contribute to a worse prognosis.

Lloyd G and Guthrie E. *Handbook of Liaison Psychiatry*, illustrated edition. Cambridge University Press, 2007, p. 392.

12.E. Lifestyle factors predict the development of peptic ulcer in susceptible individuals. They are potential mediators in the aetiological matrix between stress and ulcer. These include cigarette smoking; heavy alcohol consumption; lack of sleep; not eating breakfast; non-steroidal anti-inflammatory drugs; hard on-the-job labour and low socioeconomic status.

Lloyd G and Guthrie E. *Handbook of Liaison Psychiatry*, illustrated edition. Cambridge University Press, 2007. p. 392.

13.A. Organic and neuropsychiatric disorders in HIV are common, and may result from the direct effects of HIV, opportunistic infections, effects of neoplasms, metabolic abnormalities, iatrogenic interventions and others. The prevalence of HIV dementia is around 10–15%. Cognitive changes may be directly due to the effects of HIV itself, secondary to opportunistic infection following treatment, or due to pre-existing psychological morbidity. These changes may be classified into early and late. Early symptoms consist of forgetfulness, poor concentration, balance problems, apathy, withdrawal, dysphoric mood, and dyspraxia. Symptoms that are suggestive of a late change include disorientation, confusion, peripheral neuropathies, slowed verbal responses, indifference to illness, organic psychosis, incontinence, and carphologia (picking imaginary objects and bed linen).

Lloyd G and Guthrie E. *Handbook of Liaison Psychiatry*, illustrated edition. Cambridge University Press, 2007, p. 482.

14.B. BMI is a simple index of weight-for-height that is commonly used to classify underweight, overweight, and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in metres (kg/m^2). BMI values are age independent and the same for both sexes. However, BMI may not correspond to the same degree of fatness in different populations due, in part, to different body proportions. The health risks associated with increasing BMI are continuous and the interpretation of BMI grading in relation to risk may differ for different populations: underweight <18.50 ; normal range 18.50–24.99; overweight ≥ 25.00 ; pre-obese 25.00–29.99; obese ≥ 30.00 ; obese class I 30.00–34.99; obese class II 35.00–39.99; obese class III ≥ 40.00 .

World Health Organization. *Obesity: Preventing and Managing the Global Epidemic*. Report of a WHO Consultation. WHO Technical Report Series 894. Geneva, 2000.

15.D. The clinical presentation of delirium is defined by psychopathology and temporal course. It is usually of acute onset and the cardinal feature is a disturbance in consciousness. Impairment of consciousness is the key feature that separates delirium from most other psychiatric disorders. There is a continuum between mild impairment of consciousness and near unconsciousness. There is fluctuation in intensity, and symptoms are often worse at night. The other features are an inability to focus and maintain attention, perceptual disturbances, disorientation in time and/or space, rarely to people (though false recognition is common) and almost never to self. Disorientation to time is often the first warning sign of delirium. Attention is poor and the patient is easily distractable, looking either apathetic or intensely focused upon something. Psychomotor disturbance may be in the form of agitation or retardation. Other features may include lability of mood and incoherent speech.

Gelder M, Harrison P, and Cowen P. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006; p. 329.

16.C. Psychiatric manifestations are common in SLE. Up to 90% of patients have some neuropsychiatric manifestation. In most patients, CNS complications present early in the illness, and studies that have looked into it have found no relationship between systemic disease activity and neuropsychiatric manifestations. In fact, neuropsychiatric causes are second only to renal causes as far as mortality is concerned in these patients. These complications include stroke, seizures, transverse myelitis, etc. Cognitive deficits are the most common neuropsychiatric manifestation in these patients. It is present in up to 80% of the patient sample. These have been correlated with the presence of anticardiolipin antibody. In this way, most psychiatric illnesses have been correlated with the presence of an antibody in the blood. Depression has been reported in up to 40% of people with SLE. Psychiatric symptoms in SLE have been attributed to direct CNS involvement, infections, side-effects of medications, reactions to chronic illness and primary psychiatric illness. Similarly, stress has been linked to exacerbation of SLE. This is said to be mediated through the immune system.

Levenson JL. *Essentials of Psychosomatic Medicine*, 1st edn. American Psychiatric Press, 2006, 139–141.

Stojanovich L, Zandman-Goddard G, Pavlovich S and Sikanich N. Psychiatric manifestations in systemic lupus erythematosus. *Autoimmunity Reviews* 2007; **66**: 421–426.

17.E. PANDAS is a controversial disease. In fact, Levinson says that it is not a diagnosis, but a syndrome where obsessive compulsive disorder and tics have been exacerbated in children following a group A beta-haemolytic streptococcal (GABHS) infection. The diagnostic criteria for PANDAS that were proposed by Swedo et al. in 1998 include the following: OCD and/or chronic tic disorder (Tourette's, chronic motor, or vocal tic disorder) that meets the DSM-IV diagnostic criteria; age at onset between 3 years and the onset of puberty; clinical course with an abrupt onset of symptoms and/or a pattern of dramatic recurrent exacerbations and remissions; temporal relation between GABHS infection and onset and/or exacerbations of clinical symptoms; and neurologic abnormalities such as motoric hyperactivity, tics, or choreiform activity during an exacerbation.

James L. Levenson *Essentials of Psychosomatic Medicine*, 1st edn. American Psychiatric Press, 2006, p. 181.

Swedo SE, Leonard HL, Garvey M, et al. Pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections: clinical description of the first 50 cases. *American Journal of Psychiatry* 1998; **155**: 264–271.

18.A. Despite the fact that anxiety is a cardinal feature of hyperthyroidism, anxiety disorders are observed in only up to 15% of the patients. Major depression is the most common psychiatric manifestation, seen in up to 25% of the people diagnosed with hyperthyroidism. Cognitive disturbance is seen in around 7.5% of patients. Mania and hypomania are less common, with a prevalence of around 2%, and psychosis occurs in around 2% of the population with hyperthyroidism.

Hales RE and Yudofsky SC. *The American Psychiatric Publishing Textbook of Neuropsychiatry and Clinical Neurosciences*, 4th edn. American Psychiatric Press, 2002, pp. 858–860.

19.B. Patients with hypothyroidism present with all of the above symptoms. But the most commonly reported psychiatric symptoms are that of cognition, which occurs in around 45% of the patients. This can extend from mild subjective slowing to delirious and even encephalopathic states. Delirium is the most severe manifestation of hypothyroidism. Depression is the second most frequent psychiatric syndrome. Anxiety disorder is present in around 30% of the patients, and although myxoedema madness ‘psychosis’ is one of the most common symptoms reported in the literature, it represents only around 5% of psychiatric morbidity in these patients.

Hales RE and Yudofsky S.C. *The American Psychiatric Publishing Textbook of Neuropsychiatry and Clinical Neurosciences*, 4th edn. 2002, p. 856–857.

20.E. Nearly all steroids have been implicated. Psychiatric symptoms are mostly affective in nature, more specifically elation. Psychosis, delirium, and anxiety have been reported. Steroid-induced psychosis may be secondary to delirium, an exacerbation of pre-existing psychosis or frank psychosis precipitated by steroids (this includes mania). The prevalence of psychiatric disturbance in patients who have been administered corticosteroids is said to be dose related. Various strategies to prevent the onset of steroid-induced psychiatric manifestations include administering the medication in divided doses, enteric coated preparations, lithium, and valproate prophylaxis for those with a previous history. Tricyclic antidepressants (TCAs) are best avoided as these have been associated with an exacerbation of symptoms.

Hales RE and Yudofsky SC. *The American Psychiatric Publishing Textbook of Neuropsychiatry and Clinical Neurosciences*, 4th edn. American Psychiatric Press 2002, p. 863.

21.A. Full depressive syndrome has been reported in up to 70% of people with Cushing’s syndrome. The most common cause of Cushing’s syndrome is pharmacological. Cushing’s disease is a primary pituitary tumour, which secretes an excess of adrenocorticotrophic hormone (ACTH). Psychiatric manifestations may be due to the direct effects of elevated corticosteroids on the neurons or due to hypothalamic dysfunction. The neocortex and hippocampus have glucocorticoid receptors, the action on which could explain the cognitive and mood disorder seen in these patients. Cushing’s disease has been associated with a reduction in hippocampal volume, which is reversed on correction of steroid levels. There is also some evidence to show that stress could be associated with exacerbation of the illness.

Levenson JL. *Essentials of Psychosomatic Medicine*, 1st edn. American Psychiatric Press, 2006, p. 96.

22.A. This patient shows the classical features of hyperparathyroidism leading to hypercalcaemia, possibly precipitated by the irradiation to the neck. The psychic moans are most commonly due to depression and cognitive symptoms. These have been correlated with the degree of calcium elevation. In severe cases, confusion, catatonia, agitation, psychosis, and coma can occur. Most patients improve with treatment and correction of calcium levels.

Hales RE and Yudofsky SC. *The American Psychiatric Publishing Textbook of Neuropsychiatry and Clinical Neurosciences*, 4th edn. American Psychiatric Press 2002, p. 867.

23.D. Huntington's disease is an autosomal dominant disorder resulting from a mutation on chromosome 4, which leads to an increased number of CAG trinucleotide repeats from 6–34 to 39–86. Patients with longer trinucleotide repeat lengths have an earlier age of onset and more rapid progression than those with fewer repeats. It is seen that those who inherit the disease from the paternal side have a greater number of repeats and hence show an earlier age of onset, a phenomenon called genetic anticipation. Clinically, Huntington's disease is manifested by the triad of chorea, dementia, and psychiatric symptoms. Approximately 40% of patients exhibit major depressive disorders or meet criteria for dysthymia. Approximately 10% of patients exhibit hypomania and a few may have manic episodes. Apathy, irritability, and disinhibition may be present independent of a mood disorder. Sexual misconduct is more common, occurring in up to 20% of Huntington's disease patients. The rate of suicide is increased up to four times in patients with Huntington's disease. Psychiatric symptoms do not correlate with the CAG repeat length.

Cummings JL, Mega M.S. *Neuropsychiatry and Behavioural Neuroscience*, 2nd edn. Oxford University Press, 2003, p. 272.

24.D. Verbal recognition is relatively spared compared with recall, which suggests a retrieval problem rather than an encoding problem. Problems with verbal memory and visuospatial function appear early in Huntington's disease, but don't progress as much as in patients with Alzheimer's. The picture is typical of a subcortical dementia involving frontal subcortical circuits. Patients with Huntington's disease show a typical loss of procedural memory. Executive function is lost early in the disease. They also show psychomotor slowing and attentional deficits that correlate with activities of daily living (ADL). Unlike psychiatric symptoms, cognitive symptoms correlate with the number of trinucleotide repeats. Speech comprehension is maintained late into the disease well after intelligible speech production is lost.

Cummings JL and Mega MS. *Neuropsychiatry and Behavioural Neuroscience*, 2nd edn. Oxford University Press 2003, p. 272.

25.E. MCI is a syndrome characterized by the presence of cognitive decline greater than that expected for age and education level along with normal ADL. It is, thus, distinct from dementia, in which cognitive deficits are more severe and widespread and have a significant effect on daily function. A further subtype of MCI, amnestic subtype, has a higher rate of conversion to Alzheimer's disease. They characterized by memory complaints, corroborated by an informant: the presence of memory impairment relative to age- and education-matched healthy people; typical general cognitive function; largely intact ADL; and not clinically demented. Prevalence in population-based epidemiological studies ranges from 3% to 19% in adults older than 65 years. Compared with people with dementia and normal controls, individuals with MCI have intermediate amounts of Alzheimer's disease pathology, including amyloid deposition and tau-positive tangles in the mesial temporal lobes.

Gauthier S, Reisberg B, Zaudig M, et al. Mild cognitive impairment. *Lancet* 367: 1262–1270.

26.A. CADASIL (cerebral autosomal dominant arteriopathy with subcortical infarcts and leucoencephalopathy) is an autosomal dominant familial trait linked in several families to a mutation in the Notch 3 gene on chromosome 19. It presents as recurrent small-vessel strokes, beginning in early adulthood, leading to extensive symmetric white matter changes similar to Binswanger's disease and progressive dementia. The genetic nature of the syndrome may not be fully apparent because of the low penetrance. Approximately 40% of patients have migraine with aura. CADASIL is the only monogenic ischaemic stroke syndrome described. Genetic testing is available.

Kasper DL, et al. *Harrison's Principles of Internal Medicine*. McGraw-Hill, 2005.

27.E. According to Cummings, Alzheimer's disease progresses through three stages. In the first stage, the patient has anomia, defective visuospatial skills and calculation ability along with an indifferent personality. Examination of the motor system and EEG may be relatively normal, although some medial temporal atrophy may be noted in a structural brain scan. In the second stage of dementia, the patient has fluent aphasia and further deterioration in memory, visuospatial skills, and personality. In addition, there may be motor restlessness on examination. EEG may show background slowing and a structural brain scan may show temperoparietal atrophy. In the third and final stage, there is severe impairment in intellectual function and speech disturbances characterized by palilalia, echolalia, or mutism. In addition, there is sphincter disturbances, diffuse slowing on EEG and diffuse atrophy on structural scan.

Cummings JL and Mega MS. *Neuropsychiatry and Behavioural Neuroscience*, 2nd edn. Oxford University Press, 2003, p. 148.

28.A. Binswanger's disease is a slowly progressive dementia associated with subacute progression of focal neurological deficits in chronically hypertensive patients. These deficits could involve pseudobulbar, pyramidal, and parkinsonian features. Incontinence and fluctuating cognition may be seen. The periventricular area shows white matter demyelination, especially resulting from diffuse ischaemic damage. Lacunar infarcts are frequently absent. In patients thought to have multi-infarct dementia, leucoaraiosis is found in at least three quarters.

Stein G and Wilkinson G. *Seminars in General Adult Psychiatry*, 2nd edn. RCPsych Publications, 2007, p. 516.

29.C. Forty per cent of cases of FTD are familial, mainly autosomal dominant. Mutations in the tau gene were first found in FTD with parkinsonism linked to chromosome 17 (FTDP-17). Histologically FTD consist of five types. The motor neuron type with inclusions reactive for ubiquitin but not for tau is the most frequent type. The second most common is a corticobasal degeneration type that is tau positive but with ubiquitin-negative inclusions. The third is Pick's disease with neuronal loss, widespread gliosis, and inflated neurons with inclusions positive for both tau and ubiquitin. The familial pattern has tau-positive inclusions in neurons and glial cells. Clinically frontal lobe variant accounts for the most common presentation (70%). They present with symptoms suggestive of frontal lobe dysfunction. Temporal variants are of two types: semantic and progressive aphasic. Semantic dementia accounts for about 15% of the presentation. They show progressive loss of word meaning and object or face identity. Ten per cent of cases are of the progressive aphasic type.

Stein G and Wilkinson G. *Seminars in General Adult Psychiatry*, 2nd edn. RCPsych Publications, 2007, p. 519.

Cummings JL and Mega MS. *Neuropsychiatry and Behavioural Neuroscience*, 2nd edn. Oxford University Press, 2003. p. 150.

30.E. All of the given mechanisms have been proposed to be the aetiopathogenesis behind cognitive deficits in HIV infection. In the process of binding to a CD4+ receptor-containing cells, HIV gp120 binds to a calcium channel and increases intracellular free calcium. This also leads to an alteration in glucose metabolism, leading to brain dysfunction. Further, the viral genome is incorporated into the host genome, which leads to the release of more injurious compounds. These include substances such as quinolinic acid, superoxide anions, and other proinflammatory cytokines. These products, especially quinolinic acid, act as NMDA agonists, leading to excitotoxicity and cell death. TNF-alpha, one of the proinflammatory cytokines, is also known to trigger apoptosis or programmed cell death.

Hales RE and Yudofsky SC. *The American Psychiatric Publishing Textbook of Neuropsychiatry and Clinical Neurosciences*, 4th edn. American Psychiatric Press, 2002, p. 786.

31.A. Toxoplasmosis is the most common opportunistic infection seen in AIDS patients. They may present with focal or diffuse cognitive or affective symptoms. Imaging may help with the diagnosis but may be normal in many cases. Definitive diagnosis is by biopsy. Cryptococcosis presents as meningitis with headache and fever. Other viral infections of the brain may present with personality and behavioural changes. HSV encephalitis typically presents with temporal lobe symptoms. CMV infection presents as encephalitis, retinitis, and peripheral neuropathies with demyelination. Progressive multifocal leucoencephalopathy is caused by a papova virus. The prognosis is poor.

Hales RE and Yudofsky SC. *The American Psychiatric Publishing Textbook of Neuropsychiatry and Clinical Neurosciences*, 4th edn. American Psychiatric Press, 2002, p. 787.

32.C. Hyperactive delirium is characterized by increased activity levels, including restlessness, loss of control of activities, and increased speed of action. Hypoactive delirium on the other hand is characterized by decreased activity levels including apathy, listlessness, and decreased speed of action. Hyperactive delirium may present with pressure of speech, altered content, and aggression, whereas hypoactive delirium usually presents with a decreased amount of speech and hypersomnolence. Hyperactive delirium is said to have a better prognosis than hypoactive delirium. But both types of delirium are characterized by diffuse slowing on the EEG.

Hales RE and Yudofsky SC. *The American Psychiatric Publishing Textbook of Neuropsychiatry and Clinical Neurosciences*, 4th edn. American Psychiatric Press 2002, p. 543.

33.E. Along with a number of other factors, including extremes of age, pre-existing cognitive impairment, central nervous system disorders, medical comorbidity, medications, hypothermia, and electrolyte imbalance, hypoalbuminaemia is an important often unnoticed risk factor. Hypoalbuminaemia results in greater bioavailability of many drugs that use albumin as a transporter protein. This leads to greater side-effects resulting in delirium. This may not be picked up by carrying out therapeutic drug monitoring. In addition to the above, a number of surgical factors predispose to delirium, including long duration of operation, emergency procedures, and type of surgery (e.g. hip surgery).

Hales RE and Yudofsky SC. *The American Psychiatric Publishing Textbook of Neuropsychiatry and Clinical Neurosciences*, 4th edn. American Psychiatric Press, 2002, p. 534.

34.E. Atenolol is a water-soluble selective beta-blocker which has almost nil anticholinergic action. Further, due to its water-soluble property, atenolol does not cross the blood-brain barrier. All the other medications have some anticholinergic properties and may contribute to the presence of delirium, especially in older patients, who are more vulnerable and are often using multiple medications. Of these, cimetidine and prednisolone are particularly important.

Hales RE and Yudofsky SC. *The American Psychiatric Publishing Textbook of Neuropsychiatry and Clinical Neurosciences*, 4th edn. American Psychiatric Press, 2002, p. 535.

35.A. Alcohol withdrawal delirium and benzodiazepine intoxication delirium present with low-voltage fast-activity on EEG. All the other options present with diffuse slowing, which is the pattern seen in most other cases. Frontocentral spikes are usually seen in toxic delirium, i.e. usually due to hypnotic withdrawal or TCA and phenothiazine intoxication. Epileptiform activity may suggest post-ictal states or non-convulsive status epilepticus.

Hales RE and Yudofsky SC. *The American Psychiatric Publishing Textbook of Neuropsychiatry and Clinical Neurosciences*, 4th edn. American Psychiatric Press, 2002, p. 539.

36.E. Motoric hyperactivity, impulsivity, night-time difficulties, distractibility and inattention, emotional lability, some degree of anorexia, and separation anxiety are some of the behavioural symptoms reported in association with PANDAS. From the choices available, it appears auditory hallucinations would be the least common symptom. Two antibodies have been found to be suggestive of PANDAS, D8/17 and anti basal ganglia antibody. Both are not specific for PANDAS. Rising antistreptolysin O (ASO) or anti-DNAse B titres are suggestive of recent GABHS infection.

Schneider R, Robinson M and Levenson J. Psychiatry in the medically ill. *Psychiatric Clinics of North America* 2002; **25**: 9.

37.A. Of patients with intracerebral metastases, 40% originate in the lung, 20% are from breast tumours, 10% are melanomas, 7% arise from the genitourinary tract, 7% from the GIT, and 5% are of gynaecological origin.

Cummings JL and Mega MS. *Neuropsychiatry and Behavioural Neuroscience*, 2nd edn. Oxford University Press 2003, p. 402.

38.D. All of the present neuromedical treatments for MS including corticosteroids, beta-interferons, glatiramer acetate, and immunosuppressants, are suspected to affect mood, at least in some individuals. Corticosteroids are associated with euphoria initially and long-term intake could lead to a depressive state. Initial studies of interferon beta-1b, an immunomodulatory cytokine used to reduce MS disease activity over prolonged periods, found increases in depression following initiation of treatment, and increased risk of suicide attempts. More recent studies have shown that this association may not be as robust as it was thought before. In fact, at least one study has shown that baseline depression levels actually drop following treatment with the medication. It is now thought that baseline or previous history of depression is more likely to predict the development of depressive symptoms during treatment. The BNF has a warning note asking clinicians to avoid the prescription of interferon beta in patients who have a history of severe depression and suicidal ideation. Depression is also a side-effect of Baclofen, but the association is less than with interferon beta.

Feinstein A, O'Connor P and Feinstein K. Multiple Sclerosis, interferon beta-1b and depression. *Journal of Neurology* 2002; **249**: 815–820.

Goldman Consensus Group. The Goldman consensus statement on depression in multiple sclerosis. *Multiple Sclerosis* 2005; **11**: 328–337.

39.A. Neuroleptic malignant syndrome occurs in the setting of antipsychotic use or the sudden withdrawal of dopaminergic drugs and is characterized by 'lead-pipe' muscle rigidity, extrapyramidal side-effects, autonomic dysregulation, and hyperthermia. This disorder appears to be caused by the inhibition of central dopamine receptors in the hypothalamus, which results in increased heat generation and decreased heat dissipation. The serotonin syndrome, seen with SSRIs, monoamine oxidase inhibitors (MAOIs), and other serotonergic medications, has many overlapping features, including hyperthermia, but may be distinguished by the presence of diarrhoea, tremor, and myoclonus rather than the lead-pipe rigidity of neuroleptic malignant syndrome.

Fauci AS, et al. *Harrison's Principles of Internal Medicine*, 17th edn. McGraw-Hill Medical, 2008.

40.A. There is a clear link between DSH attempt and suicide, with 15–25% of those who die by suicide having presented with an episode of DSH in the year prior to their death. Between one-third and two-thirds of those who commit suicide having a lifetime history of DSH. About 0.7–1.0% of DSH patients die within a year by suicide. This is approximately 66 times the annual risk of suicide in the general population in the UK. There appears to be marked variability between different groups, with rates of suicide following DSH increasing markedly with age at initial presentation, living alone, and in those with multiple episodes of DSH. Males have almost twice the risk of females of committing suicide following an episode of DSH, especially in the following year.

Lloyd G and Guthrie E. *Handbook of Liaison Psychiatry*, illustrated edition. Cambridge University Press, 2007, p. 247.

41.D. The American guidelines recommend the use of Clozapine or Quetiapine for the management of psychosis in Parkinson's disease. The guidelines also note that Olanzapine should not be used for the same. With few exceptions, all atypical antipsychotics have comparable efficacy against psychosis and the choice is mainly based on their ease of use and the side-effect profile. Risperidone and olanzapine are associated with sedation. Risperidone can cause considerable worsening of parkinsonism. Olanzapine has been known to worsen cognition and hyperglycaemia in patients with diabetes. A recent Committee on Safety of Medicines warning suggests an increased risk of strokes associated with the use of risperidone and olanzapine in old people. Clozapine has the best evidence for use in Parkinson's as this was the first atypical antipsychotic that came on the market. However, due to the tedious monitoring protocols, it is seldom used in the population, and it has a restricted licence in the UK. Quetiapine is favoured by many psychiatrists because of its better side-effect profile and being as efficacious as Clozapine, at least in one study. Aripiprazole has been shown to worsen Parkinson's disease.

Miyasaki JM, Shannon K, Voon V, et al., Quality Standards Subcommittee of the American Academy of Neurology. Practice parameter: evaluation and treatment of depression, psychosis, and dementia in Parkinson disease an evidence-based review: report of the Quality Standards Subcommittee of the American Academy of Neurology. *Neurology* 2006; **66**: 996–1002.

Thanvi BR, Lo TCN and Harsh DP. Psychosis in Parkinson's disease. *Postgraduate Medical Journal* 2005; **81**: 644–646.

42.B. Sodium valproate is considered a human teratogen. Although several studies have shown rates of neural tube defect of up to 10%, the risk is generally considered between 1% and 2%. The effect of the drug on neural tube development is related to its use 17–30 days post conception, and the risk is dose related. The neural tube defect found in exposed infants is more likely to be lumbosacral rather than anencephalic, which suggests a drug effect on neural crest closure. The risk of Ebstein's anomaly among the offspring of lithium users is 1:1000 (0.1%) to 2:1000 (0.05%), or 20 to 40 times higher than the rate in the general population. The most common toxicity effect in offspring exposed to lithium during labour is the 'floppy baby' syndrome, characterized by cyanosis and hypotonicity. Carbamazepine is also considered a human teratogen. In one prospective study of 35 women treated with carbamazepine during the first trimester, craniofacial defects (11%), fingernail hypoplasia (26%), and developmental delay (20%) were found in live-born offspring. The rate for neural tube defects in that report and others ranged between 0.5% and 1%. Regarding antipsychotics, a recent review showed that both first-generation antipsychotics (FGA) and second-generation antipsychotics (SGA) seem to be associated with an increased risk of neonatal complications. However, most SGAs appear to increase the risk of gestational metabolic complications and babies large for gestational age and with mean birth weight significantly heavier than those exposed to FGAs. These risks have been reported rarely with FGAs. Hence, the choice of the less harmful option in pregnancy should be limited to FGAs in drug-naïve patients. When pregnancy occurs during antipsychotic treatment, the choice to continue the previous therapy should be preferred.

Yonkers KA, Wisner KL, Stowe Z, et al. Management of bipolar disorder during pregnancy and the postpartum period. *American Journal of Psychiatry* 2004; **161**: 608–620.

Morrow J, Russell A, Guthrie, et al. Malformation risks of antiepileptic drugs in pregnancy: a prospective study from the UK Epilepsy and Pregnancy Register. *Journal of Neurology, Neurosurgery, and Psychiatry* 2006; **77**: 193–198.

43.A. The Center for Disease Control definition of CFS (also called neurasthenia and myalgic encephalitis in the UK) consists of severe unexplained fatigue for over 6 months. This is of new or definite onset; not due to continuing exertion; not resolved by rest; and is functionally impairing. The criterion also mentions other symptoms that are suggestive of CFS, out of which at least four need to be present for the diagnosis. They are impaired memory or concentration; sore throat; tender lymph nodes; muscle pain; pain in several joints; new pattern of headaches; unrefreshing sleep; postexertional malaise lasting more than 24 hours. Although non-refreshing sleep is a criterion, late insomnia is not.

Gelder M, Harrison P, and Cowen P. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 387.

44.E. Two large, multicentre trials were designed to assess the safety, efficacy, and consequence of treating depression in patients with cardiovascular disease. The first, Sertraline Treatment of Major Depression in Patients with Acute MI or Unstable Angina (SADHART) was a randomized, double-blind, placebo-controlled trial conducted in 40 medical centres. The primary objective of SADHART was to evaluate the safety and efficacy of sertraline treatment for major depressive disorder in patients hospitalized for acute MI or unstable angina without other life-threatening medical complications. The results of the study indicated that sertraline was found to be safe and effective in a subgroup of more severely depressed patients. The second multicentre trial, Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD), aimed to determine whether mortality and recurrent infarction are reduced by treatment of depression after an acute MI. Treatment included cognitive behaviour therapy (CBT) and the use of SSRIs when indicated. Similar to the SADHART findings, the interventions did not increase event-free survival; however, they did improve both depression severity and social isolation.

Blumenfield, M and Strain J. *Psychosomatic Medicine*, 1st edn. Lippincott Williams and Wilkins, 2006, p. 56.

45.A. The term premenstrual syndrome (PMS) was first coined by a physician from England named Katharina Dalton in 1953; however, premenstrual tension was a term used prior to this. More than 150 different symptoms have been attributed to PMS, but the one unifying concept is that these symptoms must occur during the (late) luteal phase of the menstrual cycle, causing significant impairment in a woman's functioning, and must disappear within the first few days of menses. The American Psychiatric Association recognizes premenstrual dysphoric disorder (PMDD) as a subset of PMS that was designed to focus on women with severe symptoms causing marked impairment in functioning. PMDD has a lifetime prevalence of approximately 2–4% in menstruating women. Sixty-five per cent of women with unipolar mood disorder experience PMS, and women with PMS have a 60% lifetime prevalence of major depression. In a recent meta-analysis on the efficacy of SSRIs in PMDD, 15 randomized controlled trials (RCTs) were found demonstrating SSRIs as effective for behavioural and physical symptom amelioration and have the best evidence to date. Other supplements do not have solid research evidence to support their use to date, including vitamin E, vitamin A, magnesium, primrose oil, dong quai, black cohosh, wild yam, St John's wort, or kava.

Wyatt KM, Dimmock PW and O'Brien PMS. Selective serotonin reuptake inhibitors for premenstrual syndrome. *Cochrane Database Syst Rev* 2004.

Blumenfield M and Strain, J. *Psychosomatic Medicine*, 1st edn. Lippincott Williams & Wilkins, 2006, p. 583.

46.E. The evidence here is limited and sometimes conflicting. Overall it seems that a current eating disorder, particularly active anorexia nervosa, carries an excess small risk to the mother and the foetus. A recent large cohort study published in the *British Journal of Psychiatry* of women with anorexia nervosa, women with bulimia nervosa, women with both disorders, and controls found that women with bulimia nervosa were significantly more likely to have a history of miscarriage and those with anorexia nervosa were significantly more likely to have smaller babies than the general population. Previous retrospective studies have found that women with a history of an eating disorder had a higher rate of miscarriage, small for gestational age babies, low birth weight babies, babies with microcephaly, intrauterine growth restriction, and premature labour.

Ward VB. Eating disorders in pregnancy. *British Medical Journal*, 2008; **336**: 93–96.

Micali N, Simonoff E and Treasure J. Risk of major adverse perinatal outcomes in women with eating disorders. *British Journal of Psychiatry* 2007; **190**: 255–259.

47.E. Much of what we know about suicide in the UK psychiatric population is based on data collected by the National Confidential Inquiry into Suicide and Homicide by People with Mental Illness. They are a relatively morbid group – more than half of patients had a secondary psychiatric diagnosis, and 16% of patients had been admitted to a psychiatric bed on more than five occasions. Forty-nine per cent of the patients who died had been in contact with services in the previous week, 19% in the previous 24 hours. At final contact, immediate suicide risk was estimated to be low or absent in 86% of cases. 14% were non-compliant with treatment.

Appleby L, et al. *Avoidable deaths. Five year report of the national confidential inquiry into suicide and homicide by people with mental illness*. The University of Manchester, 2006.

48.B. Common somatic complaints of pregnancy may be misconstrued as symptoms of depression when using traditional depression assessment scales (such as the Beck Depression Inventory, the Hamilton Rating Scale for Depression, or the Center for Epidemiological Studies Depression Scale), symptoms of depression reported by pregnant women may be misidentified as normal pregnancy-related complaints by treating obstetricians. Use of the 10-item Edinburgh Postnatal Depression Scale has been found to accurately identify depression in pregnant and postpartum women. This brief screening instrument has been validated in pregnant and postpartum populations and is easily incorporated for standard practice use in obstetrical treatment settings.

Kaplan HI. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams & Wilkins, 2004 p. 2306.

49.E. Suicide rates are increased in all psychiatric disorders, except dementia. Most estimates of the lifetime suicide rate in schizophrenia are in the region of 5% to 10%, slightly less than in major affective disorders. The long-term risk of suicide in primary affective disorder has been estimated at 15%. Suicidal behaviour is most common among patients with depression, alcoholism or substance abuse, schizophrenia, and personality disorder. Anxiety disorders were found to be independently associated with a more than doubled risk of past and future suicidal ideation and behaviour.

Lloyd G and Guthrie E. *Handbook of Liaison Psychiatry*, illustrated edition. Cambridge University Press, 2007, p. 249.

Sareen J, Cox BJ, Afifi TO, et al. Anxiety disorders and risk for suicidal ideation and suicide attempts: a population-based longitudinal study of adults. *Archives of General Psychiatry* 2005; **62**: 1249–1257.

50.C. The most common constellation of mood symptoms experienced by women in the immediate postpartum period is typically referred to as the postpartum blues or baby blues. A relatively common phenomenon (occurring in 50–80% of women), postpartum blues include transient symptoms and rapid mood shifts, including tearfulness, irritability, anxiety, insomnia, lack of energy, loss of appetite, and the general experience of feeling overwhelmed particularly with regard to newborn care-giving tasks. By definition, the postpartum blues are transient in nature. Onset typically occurs after the third postpartum day, after the mother has left the hospital after delivery. Symptoms typically peak by day 5 and spontaneously resolve by day 10 postpartum. It has been estimated that 75% of women who experience symptoms of postpartum blues will display such a time-limited course; however, 20–25% may go on to experience full-blown postpartum depression.

Kaplan HI. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams & Wilkins, 2004 p. 2308.

chapter
7

PSYCHOTHERAPY

QUESTIONS

- 1. Lisa is a 35-year-old lady, diagnosed with depression. She has been referred by her psychiatrist for psychodynamic psychotherapy. According to her therapist, Lisa has the ability to conceive of her own mental state as explanations of her behaviour. This phenomenon is called**
 - A. Transference
 - B. Mentalization
 - C. Counter transference
 - D. Empathy
 - E. None of the above

- 2. Which of the following suggests sufficient psychological mindedness in Lisa?**
 - A. She needs a lot of prompts to give her story
 - B. She finds it difficult to bring up memories with appropriate affect
 - C. She is unaware of this unconscious mental life
 - D. She does not have poor self-esteem
 - E. She is unable to step back and observe reflectively

- 3. During her first session, Lisa asks her therapist about certain terms she came across on the internet. “What is transference?”**
 - A. Empathy in relationships
 - B. Therapist's response to the patient based on the therapist's previous relationships
 - C. Patient's response to the therapist based on the patient's previous relationships
 - D. Transfer of positive thoughts from the therapist to the patient through self-disclosure
 - E. All of the above

- 4. Which of the following correctly describes counter-transference?**
 - A. The analyst's or psychotherapist's transference reactions to the patient
 - B. His or her reactions to the patient's transferences
 - C. Any reactions, feelings and attitudes of the analyst or therapist towards the patient, regardless of their source.
 - D. All of the above
 - E. None of the above

5. During the psychotherapy sessions, the therapist notes that Lisa uses a number of defence mechanisms that are classified as 'mature defences' according to Vaillant. Which of the following is a mature defence?
- A. Suppression
 - B. Repression
 - C. Dissociation
 - D. Passive aggression
 - E. Denial
6. Nearing the end of her therapy session, Lisa blurts out 'I am abusing my children' before quickly shifting the topic to other things. What is the most immediate appropriate thing for the therapist to do?
- A. End the session on time and explore it in the next session
 - B. Ask her what she meant by 'abusing'
 - C. Reassure her that everything said in therapy is confidential
 - D. Tell her that you have to report her to the social services
 - E. Carry out an extensive assessment of risk to the child
7. Which of the following represents the concept of borderline personality organization?
- A. Identity diffusion
 - B. Utilizing primitive defences
 - C. Intact reality testing
 - D. Characteristic splitting in object relations
 - E. All of the above
8. In dynamic psychotherapy, the therapist at times uses certain techniques that represent the 'supportive' end of the psychodynamic continuum rather than the 'expressive' end. Which of the following is suggestive of a 'supportive' technique?
- A. Confrontation
 - B. Clarification
 - C. Interpretation
 - D. Interpretation of transference
 - E. Giving advice
9. The process by which unconscious ideas are repressed and prevented from reaching awareness because they are unacceptable in psychotherapy is called
- A. Transference
 - B. Counter-transference
 - C. Resistance
 - D. Therapeutic alliance
 - E. Repression

- 10. Jack is a 35-year-old man who perceived his parents as overly authoritarian. His therapist on the other hand, is friendly and non-authoritarian, but at times firm and sets definite limits. The attitude of his therapist gave Jack the opportunity to identify with a new parent figure. This is an example of a process described by Franz Alexander. Which of the following terms best represents this process?**
- A. Resistance
 - B. Counter-transference
 - C. Corrective emotional experience
 - D. Therapeutic alliance
 - E. Childhood neurosis
- 11. Nick has been diagnosed with major depression. His GP is considering referring Nick for psychodynamic psychotherapy. According to the GP, Nick has certain qualities he thinks are important for a good prognosis in psychodynamic psychotherapy. Which of the qualities shown by Nick has been shown NOT to predict good response in psychodynamic psychotherapy?**
- A. Psychological mindedness
 - B. Introspectiveness
 - C. Acting out affects
 - D. Reasonable object relationships
 - E. Intense search for understanding
- 12. Brief psychodynamic psychotherapy has been shown NOT to be of benefit in which of the following conditions?**
- A. Panic disorder
 - B. Severe depression
 - C. Interpersonal difficulties
 - D. Opiate dependence
 - E. Somatoform disorder
- 13. Which of the following therapies involve 'strokes' that people exchange and 'games' that people play?**
- A. Person-centred psychotherapy
 - B. Gestalt therapy
 - C. Transactional analysis
 - D. Existential therapy
 - E. Physiotherapy
- 14. Focusing on a detail out of context while ignoring other, more salient features in the situation is called**
- A. Arbitrary interference
 - B. Selective abstraction
 - C. Overgeneralization
 - D. Dichotomous thinking
 - E. Personalization

15. Global, rigid, absolute, and overgeneralized convictions about the self that have powerful effects on how we perceive ourselves are called

- A. Core beliefs
- B. Conditional rules
- C. Automatic thoughts
- D. Intermediate beliefs
- E. None of the above

16. Which of the following terms refer to beliefs that thoughts and behaviours have reciprocal and equivalent effects?

- A. Anxiety sensitivity
- B. Pathological worry
- C. Thought-action fusion (TAF)
- D. Intolerance of uncertainty
- E. None of the above

17. Which of the following is a technique for automatic thought modification?

- A. Guided discovery
- B. Recognizing mood shifts
- C. Checklists for automatic thoughts
- D. Imagery
- E. Examining the evidence

18. A woman comes to your outpatient clinic. She has recurrent thoughts of contamination with germs and has to wash her hands up to 20 times every time she touches wooden surfaces. This prevents her from looking after her 2-year-old child. She is worried that the child may not be gaining the required weight. She has also started to lose the skin of her palms due to the excessive washing. The treatment you would recommend would be

- A. Cognitive behaviour therapy (CBT)
- B. Combination of selective serotonin reuptake inhibitors (SSRIs) and CBT
- C. SSRI only
- D. Psychodynamic therapy
- E. Eye movement desensitization therapy (EMDR)

19. Jack has certain core beliefs about being unlovable. He thinks that this characteristic makes people abandon him. In order to avoid this, he turns out to be excessively self-sacrificing to his family. From a schema-based therapy point of view, what is the underlying cognitive process that is maintaining the schema?

- A. Schema surrender
- B. Schema compensation
- C. Schema avoidance
- D. Schema utilization
- E. None of the above

20. Maria has obsessive thoughts of a violent nature towards her mother. Which of the following is the least characteristic of dysfunctional assumptions likely to be seen in Maria?

- A. Having a thought about stabbing my mother is like doing it
- B. I should exercise control over my thoughts
- C. Although I believe that I will not hurt my mother, I am still responsible for this harmful thought
- D. Not neutralizing the thought of stabbing her mother is equivalent to wishing her mother stabbed
- E. If I don't please everyone, I am a failure

21. Covert sensitisation is best used in the treatment of which of the following

- A. Alcohol dependence
- B. Panic disorder
- C. Generalized anxiety disorder
- D. OCD
- E. Major depressive disorder

22. Parent management training is based on the principles of

- A. Psychoanalysis
- B. Learning theory
- C. Systems theory of family therapy
- D. Object relations theory
- E. Play therapy

23. Which of the following is the first step in systematic desensitization?

- A. Constructing a hierarchy
- B. Relaxation training
- C. Exposure *in vivo*
- D. Exposure *in vitro*
- E. Flooding

24. Habit reversal components include all the following except

- A. Training to be aware of onset
- B. Training in thought stopping
- C. Training in initiating competing response
- D. Relaxation
- E. Social support

25. Orgasmic reconditioning is used in

- A. Premature ejaculation
- B. Erectile dysfunction
- C. Delayed ejaculation
- D. Changing sexual preferences
- E. None of the above

26. Massed negative practice treatment is used in the treatment of

- A. Tic disorder
- B. OCD
- C. Generalized anxiety disorder
- D. Panic disorder
- E. None of the above

27. Token economy programmes are based on which of the following psychological principle?

- A. Classical conditioning
- B. Operant conditioning
- C. Vicarious learning
- D. Aversive conditioning
- E. None of the above

28. Dawn is known to have moderate learning disability. She hits her head very often with her right hand. Her therapist teaches Dawn to engage in knitting with her right hand. This gradually replaced her maladaptive behaviour. The process through which the therapist replaced a maladaptive behaviour with an adaptive constructive one is through the principles of

- A. Positive behavioural programming
- B. Massed negative practice treatment
- C. Functional communications training
- D. Habit reversal programme
- E. None of the above

29. Which of the following is the least likely outcome in a patient undergoing CBT for hypochondriasis?

- A. Decrease in hypochondriacal thoughts
- B. Better social role functioning
- C. Less distress at thoughts of illness
- D. Decrease in health-related anxiety
- E. Remission of hypochondriacal somatic symptoms

30. Which of the following approaches have shown to be the most effective in bulimia nervosa?

- A. CBT
- B. Interpersonal psychotherapy (IPT)
- C. Psychodynamic psychotherapy
- D. Family therapy
- E. Exposure and response prevention.

- 31. How would you treat an intelligent 15-year-old boy with moderate depression but no suicidal thoughts?**
- A. CBT
 - B. SSRI and CBT
 - C. TCA alone
 - D. TCA and CBT
 - E. SSRI alone
- 32. The therapeutic work of interpersonal psychotherapy is organized around central interpersonal problem areas in the patient's life. Which of the following situations are possible problem areas in a case of acute depression?**
- A. Role transition
 - B. Grief
 - C. Role dispute
 - D. Interpersonal deficits
 - E. All of the above
- 33. Which of the following is NOT a step in interpersonal psychotherapy for depression?**
- A. Evaluating depressed mood
 - B. Evaluating interpersonal relationships
 - C. Employing thought records
 - D. Improving capacity to communicate
 - E. Enhancing understanding of depression as a medical illness
- 34. In the landmark National Institute of Mental Health (NIMH) Treatment of Depression Collaborative Research Program, which of the following psychotherapies was found to be equivalent to imipramine in severe depression?**
- A. CBT
 - B. IPT
 - C. Psychodynamic psychotherapy
 - D. Family therapy
 - E. All of the above
- 35. Which of the following is the first step involved in crisis intervention?**
- A. Patient is encouraged to consider solutions
 - B. Assess the patient's problems and assets
 - C. Test the solutions
 - D. Reduce arousal
 - E. Consider future coping mechanisms

36. Dialectical behavioural therapy uses all of the following techniques except

- A. Cognitive behavioural techniques
- B. Mindfulness techniques
- C. Aphorisms
- D. Role reversal
- E. Dialectical techniques

37. Which of the following is considered to be the most important therapeutic factor in group psychotherapy?

- A. Ventilation of affect
- B. Pairing
- C. Cohesion
- D. Dependence
- E. Discussion

38. In a therapeutic community, the members tolerate behaviour that may not be accepted anywhere else. This process is called

- A. Permissiveness
- B. Cohesion
- C. Mutual help
- D. Imitation
- E. Altruism

39. In a family therapy session, the mother is asked to comment on the relationship between her husband and their eldest son. After this, the family members are asked to comment on the mother's response. This method is called

- A. Paradoxical injunction
- B. Circular questioning
- C. Socratic questioning
- D. Role reversal
- E. Sculpting

40. Which of the following is not a goal of family therapy?

- A. Improving communication
- B. Improving agreement on roles of each member
- C. Improving cognitive style
- D. Decreasing conflict among members
- E. Decreasing distress in the member considered to be the patient

41. Traps, dilemmas, and snags are techniques typically used in

- A. Cognitive analytical therapy
- B. Cognitive behavioural therapy
- C. Rational emotive therapy
- D. Interpersonal therapy
- E. Psychodynamic psychotherapy

42. Which of the following statements accurately describes collaborative empiricism in CBT?

- A. A relationship in which the client is presumed to be right in his or her assumptions and the therapist collaborates to reduce the impact of the assumptions
- B. A relationship in which the therapy is considered empirical with no guaranteed positive outcome in order to avoid later disappointment
- C. A relationship in which the therapist and client share their problems with each other and collaborate to find mutual solutions
- D. A relationship in which the therapist and the client work as partners in identifying and modifying dysfunctional cognitions and behaviours.
- E. A relationship in which the client agrees for the therapist to share information with multiple other therapists who offer different models of therapy

43. A method of group psychotherapy where members of the group take on the roles of 'the protagonist' and 'auxillary ego' while the therapist takes on the role of 'the director' is

- A. Drama therapy
- B. Biofeedback therapy
- C. Psychodrama
- D. Direction group
- E. Auxillary ego therapy

44. Justin is a medical student who faints every time he encounters medical situations involving blood or injury. His therapist trains him to tense the muscles of the arms, legs, and torso at the earliest signs of faintness. This type of therapy is called

- A. Applied relaxation
- B. Applied tension
- C. Autogenic training
- D. Biofeedback
- E. Self-hypnosis

45. The acronym 'FRAMES' in brief intervention for alcohol dependence stands for all except

- A. Feedback
- B. Roll with resistance
- C. Advice
- D. Empathic interviewing
- E. Self-efficacy

46. In the treatment of borderline personality disorder, which of the following does Stage 2 of dialectical behaviour therapy target?

- A. Severe behavioural dyscontrol
- B. Quiet desperation
- C. Problematic patterns in living
- D. Incompleteness
- E. None of the above

- 47. Rachel is a 35-year-old woman who was recently involved in a life-threatening road traffic accident. She developed symptoms suggestive of post-traumatic stress disorder (PTSD) over a period of a month following the accident. The symptoms interfered with her daily activities. She refused to drive to work and started missing her work. She also stopped taking her children to the nursery. According to NICE guidelines, what treatment is recommended?**
- A. Trauma-focused CBT
 - B. Single-session debriefing
 - C. Wait and watch
 - D. EMDR
 - E. Relaxation therapy
- 48. During a biofeedback session, which of the following denotes a stage of relaxation?**
- A. Increase in beta waves on EEG
 - B. Decrease in skin conductance
 - C. Decrease in skin temperature
 - D. Increase in action potential recordings on the electromyogram (EMG)
 - E. All of the above
- 49. Cognitive therapy aims to modify the schemas that perpetuate depression or anxiety. Which of the following is least likely with respect to schemas?**
- A. Schemas contain basic rules for screening, filtering, and processing external information
 - B. Schemas are behaviours representative of the patient's presenting problem
 - C. Conditional rules such as 'if–then' statements can serve as dysfunctional schemas
 - D. Schemas include core beliefs about oneself
 - E. Simple schemas can exist without influencing psychopathology
- 50. On the basis of cognitive theory, certain cognitive distortions are formulated to explain both behavioural features and bodily symptoms of various psychiatric disorders. Which of the following themes is correctly matched with the disorder?**
- A. Hopelessness: panic disorder
 - B. Sense of failure: agoraphobia
 - C. Attentional bias towards threat: generalized anxiety disorder
 - D. Black and white thinking: schizophrenia
 - E. Minimization of positive appraisal: specific phobias

1.B. The capacity for mentalizing grows out of attachment theory and refers to a person's ability to conceive of his or her own and others' mental states as explanations of behaviour. Hence, it is related to psychological mindedness. The psychodynamic clinician assesses the ability of a patient to see that his or her behaviour grows out of a set of beliefs, feelings, and perspectives that are not necessarily the same as others'. Like empathy, mentalizing requires a capacity to sense what is going on in another's mind and respond accordingly. This capacity to be sensitive to what others are feeling and to know that one's internal states contribute to one's behaviour augurs well for a more exploratory or interpretative approach in dynamic psychotherapy.

Gabbard GO. *Textbook of Psychotherapeutic Treatments in Psychiatry*, 1st edn. American Psychiatric Publishing, 2008, p 29.

2.D. According to Nina Coltart, during psychotherapy, a therapist is exercising his/her skills and psychological mindedness to explore the patient's psyche. If the patient is also psychologically minded, the prospects of treatment success are thought to be greatly increased. Whether a patient is psychologically minded depends on a number of characters. They include:

1. The capacity to give a history that deepens, acquires more coherence, and becomes texturally more substantial as it goes on.
2. The capacity to give such a history without needing too much prompting, and a history which gives the listener an increasing awareness that the patient feels currently related in him/herself, to his/her own story.
3. The capacity to bring up memories with appropriate affects.
4. Some awareness in the patient that he has an unconscious mental life.
5. Some capacity to step back, if only momentarily, from self-experience, and to observe it reflectively.
6. The capacity, or more strongly a wish, to accept and handle increased responsibility for the self.
7. The capacity to imagine and dream and use metaphors.
8. Some capacity for achievement, and some realistic self-esteem.

Coltart N. The assessment of psychological-mindedness in the diagnostic interview. *British Journal of Psychiatry* 1988; **153**: 819–820.

Naismith J and Grant S. *Seminars in the Psychotherapies*. Gaskell, 2007, p. 8.

3.C. Transference is the displacement of feelings and thoughts associated with a figure in the patient's past onto the therapist. Transference is often unconscious, at least initially, and the patient is often puzzled by their behaviour towards the therapist because it does not make sense, based on who the therapist really is. Hence the enactment of missing a session or of coming late to a session may reveal unconscious transference. The prevailing view about transference is that the therapist's actual behaviour always influences the patient's experience of the therapist. Hence the transference to the therapist is partly based on real characteristics and partly on figures from the patient's past: a combination of old and new relationships. Many therapists believe that interpretation of this transference is an essential process of psychodynamic psychotherapy. Gabbard says that one should postpone the interpretation of transference until it becomes a resistance and until it is close to the patient's awareness. In other words, if things are going reasonably well, it makes no sense to interpret transference. If the patient develops, for example, erotized or highly negative feelings, which impede the process of the therapy, interpretation may be essential. Many therapists regard treatment that focuses on transference as more exploratory than therapy geared to extra-transference relationships. In supportive therapy, interpretation of the transference may be minimized, although the therapist may silently interpret the transference as a way of increasing his or her understanding of the patient.

Gabbard GO. *Textbook of Psychotherapeutic Treatments in Psychiatry*, 1st edn. American Psychiatric Publishing, 2008, p. 56.

Tasman A, Maj M, First MB, et al. *Psychiatry*, 3rd edn. WileyBlackwell, 2008, p. 1854.

4.D. Freud used the term counter-transference to describe the analyst's transference towards the patient. In other words, the patient might remind the therapist of someone from the therapist's past, so that the therapist starts to treat the patient as though he or she were that figure. Over time, this view of counter-transference was broadened to include the total emotional reaction of the therapist to the patient. Today it is recognized that counter-transference is jointly created—it partly involves the therapist's past relationships, but it also involves feelings induced in the therapist by the patient's behaviour. Counter-transference is variously defined as (1) the analyst's or psychotherapist's transference reactions to the patient; (2) his or her reactions to the patient's transferences; and (3) any reactions, feelings and attitudes of the analyst or therapist toward the patient, regardless of their source. These responses are manifestations of the requisite engagement by the therapist or analyst in the emotional process of treatment. Moreover, these reactions are a rich source of understanding of the patient's experience as it touches the therapist affectively.

Gabbard GO. *Textbook of Psychotherapeutic Treatments in Psychiatry*, 1st edn. American Psychiatric Publishing, 2008, p. 58.

Tasman A, Maj M, First MB, et al. *Psychiatry*, 3rd edn. WileyBlackwell, 2008, p. 1854.

5.A. George Vaillant classified defences hierarchically according to the relative degree of maturity associated with them. Narcissistic defences (denial, distortion, and projection) are the most primitive and appear in children and persons who are psychotically disturbed. Immature defences (acting out, passive-aggression, blocking, introjection, and regression) are seen in adolescents and some non-psychotic patients. Neurotic defences (dissociation, displacement, intellectualization, isolation, reaction formation, and repression) are encountered in obsessive-compulsive and hysterical patients as well as in adults under stress. Mature defences according to Vaillant are altruism, anticipation, asceticism, humour, sublimation, and suppression. These mechanisms often are used in healthy coping mechanisms.

Sadock BJ and Sadock VA. (J). *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 206.

6.B. In the USA, therapists have a legal duty to warn and protect third parties endangered by their patients. In the UK, there is no binding requirement on clinicians to disclose dangerousness. The decision to disclose is based on the judgement that the responsibility to protect the public outweighs the duty to the patient to protect confidentiality. The clinician has the responsibility to make a considered decision whether or not to infringe the right to confidentiality. Statute law (e.g. notification of diseases) determines when the clinician 'must' infringe that right; case law when he 'may' do so. Most psychotherapy falls under the latter. Each case must be considered on its merits, possibly on the basis of a risk assessment, and where there is a doubt, the clinician must discuss it with another clinician. In any case, welfare of children is of foremost importance. In this particular case, Lisa said she was abusing her children. We do not know what she meant by 'abuse'. So, as common sense would inform, the first step is for the therapist to confirm what she means by 'abuse'. If there is a need, the next step would be an informed risk assessment. Confidentiality and disclosure are usually discussed with the patient before therapy. Since there is a potential risk to children, ending the session and reassuring Lisa about confidentiality are obviously wrong choices. Premature reporting to social services would result in unnecessary labelling and also possible loss of rapport and therapeutic alliance. Criticizing her would also lead to a break in the therapeutic relationship and would be against the principles of 'unconditional positive regard'. If there is a case for disclosure, the patient herself should be encouraged to disclose to social services, as this would be in the best interests of the children involved and the patient. It is generally thought that inexperienced staff and students should not enquire about abuse or ask known victims about details of their experience, although they may be approached by patients making tentative attempts at disclosure, the general rule must be that inexperienced individuals should not invite discussion of a sensitive subject such as sexual abuse unless they are being supervised and trained to deal with it. In this case, it is thought that the psychotherapist is being supervised and would do a general risk assessment based on history and mental state.

Gabbard GO, Beck JS, and Holmes J. *Oxford Textbook of Psychotherapy*. Oxford University Press, 2007, p. 488.

Babiker IE. Managing sexual abuse disclosure by adult psychiatric patients – some suggestions. *Psychiatric Bulletin* 1993; **17**: 286–288.

7.E. Otto Kernberg proposed the term 'borderline personality organization' (BPO), a broad concept encompassing all severe personality disorders. BPO is a stable permanent state based on four criteria: diffuse identity; primitive defences, including splitting, projection, and projective identification; intact reality testing that is prone to alterations and failures because of aggression; and object relations characterized by splitting. The term 'identity diffusion' was developed by Erikson and later used by Kernberg in his concept of BPO. In psychodynamic terms an individual with identity diffusion has not integrated good self-images with bad, and, instead, has multiple, contradictory self-images, some good, some bad. These are invoked at different times and in different situations so that a meaningful, integrated image of the self is never formed. Salman Akhtar delineates the syndrome of identity diffusion as consisting of six clinical features: (1) contradictory character traits, (2) temporal discontinuity in the self, (3) lack of authenticity, (4) feelings of emptiness, (5) gender dysphoria, and (6) inordinate ethnic and moral relativism. This syndrome implies severe personality pathology. The inner world in BPO according to Kernberg, is characterized by split objects. Instead of stable and smoothly integrated internal representations of people and their relationships, the self and others are experienced in contrasts of either black or white – 'no grey zones'. These people generally have an intact reality testing, but are prone to breaks in it, leading to the so-called 'micropsychotic' episodes.

S Akhtar. *The syndrome of identity diffusion*. *American Journal of Psychiatry* 1984; **141**: 1381–1385.

Gabbard GO, Beck JS, and Holmes J (). *Oxford Textbook of Psychotherapy*. Oxford University Press 2007, p. 292.

Bruce-Jones W and Coid J. Identity diffusion presenting as multiple personality disorder in a female psychopath. *British Journal of Psychiatry* 1992; **160**: 541–544.

8.E. Dynamic (psychoanalytic) psychotherapy is often conceptualised as being on a continuum of expressive to supportive. Traditionally, psychoanalytic psychotherapy has focused on the recovery of repressed psychological material. This process has been called 'expressive' and is distinguished from the 'supportive' psychotherapies, which concentrate on supporting healthy defence (coping) mechanisms. The therapist may employ more or less expressive and supportive interventions, depending on the needs of the patient. Among the given responses in the question, advice giving leans towards the supportive end of the continuum. In addition to advice giving, other techniques usually employed that are at the supportive end of the continuum are praise, suggestions, reassurance, environmental intervention, and manipulation.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 928.

Tasman A, Maj M, First MB, et al. (). *Psychiatry*, 3rd edn. WileyBlackwell, 2008, p. 1852.

9.C. Resistance is broadly defined as the conscious or, more often, unconscious force within the patient opposing the emergence of unconscious material. Resistance is thought of as the patient's attempt to protect her or himself by avoiding the anticipated emotional discomfort that accompanies the emergence of conflictual, dangerous, or painful experiences, feelings, thoughts, memories, needs, and desires. Resistance occurs through the use of unconscious defence mechanisms. The recognition, clarification, and interpretation of resistance constitute important activities of the psychoanalyst and the psychoanalytic psychotherapist, both of whom must first appreciate how a patient is warding off anxiety before understanding why he or she is so compelled.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 926.

10.C. The therapeutic relationship between therapist and patient gives a therapist an opportunity to display behaviour different from the destructive or unproductive behaviour of a patient's parent. At times, such experiences seem to neutralize or reverse some effects of the parents' mistakes. If the patient had overly authoritarian parents, the therapist's friendly, flexible, non-judgemental, non-authoritarian, but at times firm and limit-setting attitude gives the patient an opportunity to adjust to, be led by, and identify with a new parent figure. Franz Alexander described this process as a corrective emotional experience. It draws on elements of both psychoanalysis and psychoanalytic psychotherapy.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 931.

11.C. Most psychotherapists consider certain qualities in their patients as prerequisites for engaging in psychodynamic psychotherapy. These include psychological mindedness: curiosity about oneself and the capacity for self-scrutiny. Those who are unable to articulate and comprehend their inner thoughts and feelings cannot negotiate with the fundamental analytical words and their meanings. The inability to examine one's own motivations and behaviours precludes benefits from the analytical method. Introspectiveness: the person should be able to experience and learn from intense affects or conflicts without acting them out. The person should be able to form reasonable object relationships, usually the capacity to form and maintain, as well as to detach from, a trusting object relationship is essential. High motivation: the patient needs a strong motivation to persevere, in light of the rigors of intense and lengthy treatment. The desire for health and self-understanding must surpass the neurotic need for unhappiness. The person should be able to tolerate frustration and therapeutic regression.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 926.

Tasman A, Maj M, First MB, et al. *Psychiatry*, 3rd edn. WileyBlackwell, 2008, p. 1862.

12.B. Inclusion criteria for brief psychodynamic psychotherapy diagnoses: depression, mild to moderate; anxiety, post-traumatic stress disorder; social, panic; somatoform disorders; eating disorders; opiate dependence; Patient characteristics include good object relationships (has had at least one relationship); highly motivated, 'willing' patient; narrow symptom/problem focus; interpersonal difficulties. Exclusion criteria for brief psychodynamic psychotherapy include a diagnosis of severe depression, bipolar disorder, psychosis, suicidality; obsessive compulsive disorder (OCD); severe somatizing disorders; severe eating disorders; poor object relationships; poor motivation; chronic, severe character pathology; diffuse, ill-defined symptomatology. Most of the above criteria are derived from a systematic review of psychodynamic psychotherapies by Leichsenring in 2005.

Gabbard GO. *Textbook of Psychotherapeutic Treatments in Psychiatry*, 1st edn. American Psychiatric Publishing, 2008, p. 73.

Leichsenring F. (2005). Are psychodynamic and psychoanalytic therapies effective? A review of empirical data. *International Journal of Psycho-Analysis* **86**: 841–868.

13.C. Transactional analysis developed by Eric Berne in 1960s. According to Berne, transactions are stimuli presented by one person that evoke a corresponding response in another. Berne defined psychological 'games' as stereotyped and predictable transactions that people learn in childhood and continue to play throughout their lives. Strokes, the basic motivating factors of human behaviour consist of specific rewards such as approval and love. All people have three ego states that exist within them: the child (the primitive element), the adult (the reality element), and the parent (an introject of the values of a person's actual parents). The therapeutic process helps people to understand whether they are functioning in a child, adult or parent mode when interacting with others. It is thought that as patients learn to recognize characteristic games being repeated throughout life, they can ultimately function in the adult mode as much as possible in interpersonal relationships.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 216.

Freeman C and Power M (). *Handbook of Evidence-based Psychotherapies: A Guide for Research and Practice*, 1st edn. WileyBlackwell 2007, p. 129.

14.B. The statement refers to selective abstraction, one of the cognitive biases seen in depression. Other cognitive biases include arbitrary inference, drawing a specific conclusion in the absence of evidence or when the evidence is contrary to the conclusion; overgeneralization, drawing a conclusion on the basis of one or more isolated incidents; dichotomous thinking, the tendency to classify experience in one of two extreme categories, ignoring more moderate variations; personalization, the tendency to relate external events to oneself; magnification/minimization,- exaggerating (i.e. catastrophizing) or belittling the significance or magnitude of an event.

Gabbard GO. *Textbook of Psychotherapeutic Treatments in Psychiatry*, 1st edn. American Psychiatric Publishing, 2008, p. 173.

15.A. Core beliefs are global, rigid, absolute, and overgeneralized convictions about the self, others, and the personal world that have powerful effects on how we perceive ourselves and our context. They often have their root in early childhood development. An example of core beliefs is 'I'm incompetent'. These lie dormant until they are activated by certain situations (which reflect childhood events that laid down the core belief). At the next level are 'intermediate thoughts', which consist of rules, assumptions, and attitudes that we use to evaluate ourselves as well as other people and personal experiences. On most occasions, these rules tend to contradict the core belief (in a way reinforcing them). Examples of intermediary beliefs might be 'I need to succeed in everything I do, in order for me to be seen as competent'. A special class of intermediary beliefs is the conditional rule, which takes the form of 'If ... then' statements (e.g. 'If I succeed in everything I do, only then others will consider me competent'). Automatic thoughts are cognitions that intervene between external events and a person's emotional reaction to the event. For example, the belief that people will laugh at me when I don't get a distinction at the exam is an automatic thought that occurs to someone who has the aforementioned 'core belief'.

Gabbard GO. *Textbook of Psychotherapeutic Treatments in Psychiatry*, 1st edn. American Psychiatric Publishing, 2008, p. 171.

16.C. TAF is a cognitive distortion. It is thought to have two forms: 'probability TAF' in which the intrusive thought is believed to increase the probability that a specific negative event will occur. This is prominent in those with violent obsessions. 'Morality TAF' in which experiencing the intrusive thoughts is morally equivalent to carrying out a prohibited action. This distortion is especially prominent in obsessions, is closely related to guilt, and is associated with subsequent attempts at neutralization. A comparable cognitive distortion termed 'thought–shape fusion' is thought to be present in a minority of people with eating problems and occurs when the thought of eating induces feelings of fatness, moral unacceptability, and weight gain. These cognitive distortions can be manipulated experimentally and have clinical implications that include improvement in understanding the nature of the disorder and its treatment.

Rachman S and Shafran R. Cognitive distortions: thought-action fusion. *Clinical Psychology and Psychotherapy* 1999; **6**: 80–85.

17.E. Examining the evidence is a technique in which the therapist and patient collaboratively explore the evidence for and the evidence against a specific distorted thought or belief. When working through the exercise, the therapist asks the patient to write the thought or belief at the top of a piece of paper and then label two columns with 'evidence for' and 'evidence against' the thought. The patient is then guided to explore methodically and write down each piece of evidence. At the end of this procedure, the evidence for and against the cognition is quantified and estimated. Guided discovery is the most frequently used technique to help patients articulate automatic thoughts in sessions. The specific technique used is called Socratic questioning. One of the most powerful ways of teaching patients to detect automatic thoughts is to find a real-life example of how automatic thoughts influence their emotional responses. A shift in mood during the therapy session can be an opportune time for the therapist to facilitate the identification of automatic thoughts. The Automatic Thoughts Questionnaire devised by Hollon and Kendall is a comprehensive list of dysfunctional thoughts that has been used primarily in research studies. Similar lists can be used in clinical settings when patients are having difficulty detecting their automatic thoughts. Imagery and role-play are two methods for uncovering cognitions when direct questions are unsuccessful (or partially successful) in generating suspected automatic thinking.

Gabbard GO. *Textbook of Psychotherapeutic Treatments in Psychiatry*, 1st edn. American Psychiatric Publishing, 2008, p. 208.

Hollon SD and Kendall PC (1980) Cognitive self-statements in depression: development of an automatic thoughts questionnaire. *Cognitive Therapy and Research* **4**: 383–395.

18.B. According to NICE guidelines, in the initial treatment of adults with OCD, low-intensity psychological treatments (including exposure and response prevention (ERP)) (up to 10 therapist hours per patient) should be offered if the patient's degree of functional impairment is mild and/or the patient expresses a preference for a low-intensity approach. These include brief individual CBT (including ERP) using structured self-help materials; brief individual CBT (including ERP) by telephone; group CBT (including ERP) (note, the patient may receive more than 10 hours of therapy in this format). Those with mild functional impairment who are unable to engage in low intensity CBT (including ERP), or for whom low-intensity treatment has proved to be inadequate, should be offered the choice of either a course of an SSRI or more intensive CBT (including ERP) (more than 10 therapist hours per patient). Adults with OCD with moderate functional impairment should be offered the choice of either a course of an SSRI or more intensive CBT (including ERP) (more than 10 therapist hours per patient). Adults with OCD with severe functional impairment should be offered combined treatment with an SSRI and CBT (including ERP).

NICE. CG31 Obsessive-compulsive disorder: NICE guideline. Clinical Guidelines (accessed 7 June 7 2009 <http://guidance.nice.org.uk/CG31/NiceGuidance/pdf/English>).

19.B. Schema-based approaches in cognitive therapy are based on the original ideas of Beck. Early life experiences produce a number of thought patterns or schemata. These thought patterns are like 'block moulds' into which thoughts fit in when evaluating events. They are otherwise called core beliefs. These result in underlying 'assumptions' which reinforce the core beliefs and from these arise the negative automatic thoughts. Schemata are thought to be dormant, and get activated during a depressive episode. Schemata are patterns of unconditional beliefs that are hard to access and are self-maintaining. There are thought to be three main processes that maintain schemata. Schema surrender is the process where the person seeks evidence that supports the beliefs and dismisses any evidence to the contrary. Schema compensation refers to compensating for the core belief by doing the exact opposite, but, ultimately, this action acts as a reinforcer that maintains the schema, as in the case described in the question. Ultimately, the person believes that the family loves him only because he is self-sacrificing, and if he was not, he would still remain unlovable. Schema avoidance is a group of blocking behaviours that help avoid emotional arousal – e.g. comfort eating.

Naismith J and Grant S. *Seminars in the Psychotherapies*. Gaskell, 2007, p. 149.

20.E. Salkovskis described five characteristic dysfunctional assumptions in patients with obsessive compulsive disorder (OCD). The first option refers to thought–action fusion, i.e. having a thought equates to performing the action. This is consistent with the thoughts of patients with OCD, especially those who have 'violent' obsessions. The second statement that a person should (and can) exercise control over one's thoughts is also consistent with thoughts in OCD. Responsibility is not attenuated by other factors (e.g. the low probability of occurrence) is a typical assumption in patients with OCD. The fourth option is also typical of an obsessive cognition. The final option is an assumption that is not typical of OCD. This is probably more typical of a depressive assumption that reinforces the core belief 'I am a failure'. As a corollary, there may be another secondary assumption – 'If I please everyone, I am considered successful'.

Freeman C and Power M. *Handbook of Evidence-based Psychotherapies: A Guide for Research and Practice*, 1st edn. WileyBlackwell, 2007, p. 146.

21.A. Covert sensitisation is a variant of aversive conditioning wherein images (e.g. of drinking situations) is paired with imaginary aversive stimuli (e.g. a scene of a person vomiting all over the place, or a scene of a person dying of alcohol-induced liver damage). It is called covert because neither the undesirable stimulus nor the aversive stimulus is actually presented except in the imagination. Sensitization refers to the intention to build up an avoidance response to the undesirable stimulus. This is based on aversion therapy.

Freeman C and Power M. *Handbook of Evidence-based Psychotherapies: A Guide for Research and Practice*, 1st edn. WileyBlackwell, 2007, p. 70.

22. B. Parent management training was first established as a treatment programme by Gerald Patterson in the 1970s. The programme was based on the principles of learning theory, both operant theories and social learning theories, which teach parents to use positive reinforcers, like stickers, toys, or snacks to increase positive behaviour, while using time out tactics to reduce negative behaviour like temper tantrums. Focus is on one problem behaviour at a time. The parents are taught to observe the problem behaviour – the situations and timings at which it occurs. The frequency of this behaviour is usually charted to look at the progress, while abstinence from the behaviour is positively rewarded and indulgence in the behaviour is rewarded with time outs. Parents are also taught to identify behaviours that are incompatible with the 'problem' behaviour – e.g. talking nicely instead of whining. These are called 'competing' behaviours – and these are usually rewarded. Consistency in rewarding and punishing is important in this setting. This treatment is usually used in childhood disruptive disorders such as oppositional defiant disorder or conduct disorder. Shaping and chaining are operant techniques used to induce target behaviours. Approximating 'da' and 'da' to form the word 'dada' – to which the daddy hugs the child (reinforcer) is an example of shaping. Chaining is linking of more complex tasks such as wearing a pull-over shirt – this consists of a number of complex steps. Modelling is a social learning technique where a social behaviour is reinforced by society. For example a student who changes dress to fit in with a certain group of students has a strong likelihood of being accepted and thus reinforced by that group.

Koocher GP, Norcross JC and Hill SS. *Psychologists' Desk Reference*. Oxford University Press, 2005, p. 328.

23. B. Systematic desensitization was first developed by Joseph Wolpe in the 1950s to treat phobic patients. It is based on the principles of counter-conditioning. It attempts to replace the 'fear' response to phobic stimuli with a new response (muscle relaxation) that is incompatible with fear. The first step in systematic desensitization is to train the clients in deep relaxation until they can rapidly achieve muscle relaxation when instructed to do so. The second step is to construct what is known as an 'anxiety hierarchy', in which the client's feared situations are ordered from the least to the most anxiety-provoking. Thus, for example, a person with phobia for 'cockroaches' might regard a photograph of a cockroach as only modestly threatening, but a large, rapidly moving cockroach close by as highly threatening. The client reaches a state of deep relaxation, and is then asked to imagine (or is confronted by the photograph of a cockroach) the least threatening situation in the anxiety hierarchy. The client repeatedly imagines (or is confronted by) this situation until it fails to evoke any anxiety at all, indicating that the counter-conditioning has been successful. This process is repeated while working through the levels in the anxiety hierarchy until the most anxiety-provoking situation is reached.

Gelder M, Harrison P, and Cowen P. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 591.

24. B. Habit reversal is a complex procedure used generally to treat tics, Tourette's syndrome and stuttering. The treatment has five components – training in becoming aware of the onset of the behaviour; monitoring the behaviour; training in initiating competing responses that are compatible with the behaviour; relaxation; and social support. Training in thought stopping is not a component of habit reversal training.

Gelder M, Harrison P, and Cowen P. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 593.

25.D. Orgasmic reconditioning was first described by Marquis in 1970. In this treatment, the individual is asked to masturbate regularly to their troublesome deviant fantasies, but at the point of orgasmic inevitability, to switch to a desired non-deviant fantasy. As treatment progresses, the non-deviant stimulus is introduced earlier and earlier in the arousal process until masturbation is achieved without the deviant fantasy. This technique obviously is used when the behaviour or sexual preference that is of concern is not in itself dangerous or causing a public nuisance. Following the treatment, further sexual and social skills training is usually needed to ensure that the arousal to non-deviant stimuli is maintained.

Naismith J and Grant S. *Seminars in the Psychotherapies*. Gaskell, 2007, p. 165.

26.A. Massed negative practice requires the individual to deliberately perform the tic accurately and with effort for a specific amount of time during the day. In theory, this is supposed to induce conditioned inhibition or conditioned fatigue of the behaviour, which results in a decrease in the tic. This is usually employed when habit reversal techniques have not been found to be useful. The evidence for the effectiveness of this treatment is not compelling, especially when compared with habit reversal training.

Naismith J and Grant S. *Seminars in the Psychotherapies*. Gaskell, 2007, p. 168.

27.B. Token economy is based on operant conditioning theory. Their aim is to reinforce desired behaviour, while undesired behaviour is extinguished or punished. In token economy, the therapist distributes so-called tokens for occurrences of desired behaviour, e.g. brushing teeth or cleaning the room. These tokens are chips that function as secondary reinforcers. The patient can exchange the tokens for various objects (such as money or sweets) and favours (like watching television or taking a walk outside). This was widely used in the treatment of schizophrenia in the past, although most behaviour techniques are thought to be of ethical concern. Voucher-based token economy programmes are also used in substance use programmes, where 'supermarket' vouchers worth certain amounts are given to the patient as a reward for abstinence.

Freeman C and Power M. *Handbook of Evidence-based Psychotherapies: A Guide for Research and Practice*, 1st edn. WileyBlackwell, 2007, 66–67.

28.A. Positive behavioural programming was developed to concentrate solely on interventions designed to increase desired behaviours with the theoretical argument that these would then replace problem behaviours. In this case there has been differential reinforcement of a more positive activity. Functional communication training is an example of positive behaviour programming. It is based on the hypothesis that problem behaviours are usually communication needs. Individuals are taught to communicate through alternative more acceptable ways.

Freeman C and Power M. *Handbook of Evidence-based Psychotherapies: A Guide for Research and Practice*, 1st edn. WileyBlackwell, 2007, p. 199.

29.E. In a 12-month follow-up randomized controlled trial of CBT vs treatment as usual, CBT was found to be better than medical care as usual. Compared with the control group, the CBT group had significantly lower levels of hypochondriacal symptoms, beliefs, and attitudes and health-related anxiety at 12 months. They also had less impairment of social role functioning and intermediate activities of daily living. However, hypochondriacal somatic symptoms did not improve significantly. The authors of the study Barsky and Ahern explained, 'Conceptually, hypochondriacal somatic symptoms cannot simply be stripped away with symptomatic treatment, because they exist for underlying psychological and interpersonal reasons. This suggests that a realistic goal in treating hypochondriasis is amelioration of distressing fears and beliefs and improved coping, rather than the elimination of somatic symptoms per se.'

Barsky AJ and Ahern DK. Cognitive behavior therapy for hypochondriasis: a randomized, controlled trial. *Journal of the American Medical Association* 2004; **291**: 1464–1470.

30.A. Most evidence suggests that CBT specific for bulimia nervosa (CBT-BN) devised by Fairburn has a better and faster outcome than most other psychological therapies. NICE guidelines recommend a self-help programme as possible first step for treatment. CBT-BN, a specifically adapted form of CBT, is offered to adults with bulimia nervosa as an alternative. The course of treatment should be for 16–20 sessions over 4–5 months. When people with bulimia nervosa have not responded to or do not want CBT, other psychological treatments should be considered. Interpersonal psychotherapy should be considered as an alternative to CBT, but patients should be informed it takes 8–12 months to achieve results similar to CBT.

Freeman C and Power M. *Handbook of Evidence-based Psychotherapies: A Guide for Research and Practice*, 1st edn. WileyBlackwell, 2007, p. 161.

NICE. CG9 Eating disorders: full guideline. Clinical Guidelines. <http://guidance.nice.org.uk/CG9/Guidance/pdf/English> (accessed 8 June 2009).

31.A. NICE guidelines recommend referral to CAMHS tier 2 or 3. The first step in the management is to offer one of the following specific psychological therapies (for at least 3 months) as a first-line treatment:

- individual CBT, or
- interpersonal therapy, or
- shorter-term family therapy.

If the depression is unresponsive to the above therapies in four to six sessions a multidisciplinary review should follow. Further psychological assessment for comorbidity and further psychological and social treatments that address these should be considered. Only after these steps, is medication considered as an addition.

- For young people aged 12–18 years offer fluoxetine in addition to psychological therapy.
- For children aged 5–11 years cautiously consider the addition of fluoxetine (evidence for its effectiveness in this age group is not established).

NICE. CG28 Depression in children and young people: quick reference guide. Clinical Guidelines. <http://guidance.nice.org.uk/CG28/QuickRefGuide/pdf/English> (accessed 8 June 2009).

32.E. In acute treatment for depression with IPT, the problem areas can be classified as role transitions (associated with stressful life events), grief, role disputes (e.g. in marriage), or interpersonal deficits (lack of social support). Although specific stressful experiences are relevant to other IPT problem areas in the broadest sense, adjusting to stress and change in the social context requires a role transition. This might be the case in depression following the birth of a child, retirement, medical illness, divorce, etc. According to IPT, bereavement is thought to be a potential precursor of clinical depression. Development of clinical depression following a death is evidence that the normal grief process did not take place and that the individual has had an abnormal grief reaction. In such cases the work of IPT is to help the patient experience the normal grief process. A role dispute can occur in any important relationship especially the patient's relationship with his or her spouse or significant other. In interpersonal deficits, the patient's primary problem is seen as a paucity of social connections. Relationships buffer the individual against stressful life events and are essential to psychological well-being. As such, the primary goal is to enhance the level of social connection through concrete positive changes in the patient's social activities (e.g. joining a club, taking a class). Attention to social support and a positive social network is also a component of work in the other IPT problem areas.

Gabbard GO. *Textbook of Psychotherapeutic Treatments in Psychiatry*, 1st edn. American Psychiatric Publishing, 2008, p. 275.

33.C. Because guilt and low self-esteem are characteristic of depression, patients frequently blame themselves and think of themselves as 'bad' when problems arise. Although many depressed patients report these negative cognitions, the therapist does not systematically question and evaluate the automatic negative thoughts. Unlike cognitive therapists, interpersonal therapists neither employ thought records nor weigh the evidence to help patients re-evaluate negative cognitions. Instead, therapists shift blame to the illness, which often provides patients with an immediate feeling of relief. Therapists then capitalize on this transient mood improvement by encouraging patients to take positive steps towards resolving interpersonal problems.

Gabbard GO. *Textbook of Psychotherapeutic Treatments in Psychiatry*, 1st edn. American Psychiatric Publishing, 2008, p. 290.

34.B. A landmark trial in the history of antidepressant psychotherapy was the multisite NIMH Treatment of Depression Collaborative Research Program. Investigators randomly assigned 250 outpatients with major depression to receive 16 weeks of IPT, CBT, imipramine plus clinical management, or placebo pills plus clinical management. This study was the first comparison of IPT and CBT, each of which had demonstrated efficacy in separate trials, and the first trial to use treatment manuals and monitor the psychotherapeutic input of pharmacotherapists. Most patients completed at least 12 once-weekly treatment sessions or 15 weeks of therapy. Those with milder depression (defined as a score of <20 on the 17-item Hamilton Rating Scale for Depression) improved equally regardless of which treatment was used. For more severely depressed patients (those with a Ham-D score of 20), imipramine worked fastest and was most consistently superior to placebo. IPT and imipramine had comparable effects on Ham-D scores and several other outcome measures, and were superior to placebo for more severely depressed patients. CBT was not superior to placebo among the more depressed patients.

Gabbard GO. *Textbook of Psychotherapeutic Treatments in Psychiatry*, 1st edn. American Psychiatric Publishing, 2008, p. 300.

35.D. Crisis intervention originated from the work of Lindemann and Caplan. It is based on Caplan's description of four stages of coping, including emotional arousal, disorganization of behaviour, trials of alternative coping and finally exhaustion and decompensation. Crisis intervention aims primarily to deal with the first stage, so that further stages can be prevented. Hence the first step is to reduce arousal, both physiological and emotional. The approach is collaborative with family and friends. Very often this stage includes the use of medications that prevent or help reduce arousal. Along with the reduction in arousal, the patient is encouraged to focus on the current problems and encourage self-help. The second stage of crisis intervention resembles problem-solving counselling and includes the assessment of patients' problems and assets, their ability to come up with solutions and test them, and finally to consider coping mechanisms for the future if similar problems arise.

Gelder M, Harrison P, and Cowen P. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, Oxford. p. 586.

36. D. Marsha Linehan developed dialectical therapy for patients with borderline personality disorder who repeatedly harm themselves. The treatment uses both behavioural and cognitive methods. It is highly structured and is manual based. Therapy is intense with individual sessions, skills training in a group and access by telephone to the therapist between sessions. It is delivered by a small team of therapists and lasts for up to a year. Individual sessions have four elements: cognitive behavioural techniques including self monitoring; dialectical ways of thinking about problems – seeing causality in terms of both/and rather than either/or and the possibility of reconciling opposites; mindfulness, that is the practice of detachment from the experience; use of aphorisms, that is phrases that encapsulate the approach – e.g. people may not have caused the problems, but have to solve them anyway. Skills training sessions are provided in a group basis and telephone contacts are designed to help patients get out of crises, by using the skills learnt in the sessions.

Gelder M, Harrison P, and Cowen P. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006p. 599.

37. C. Cohesion is the sense that the group is working together towards a common goal. This is believed to be the most important factor related to positive therapeutic effects. Group cohesion has been likened to the therapeutic alliance in dyadic treatment. In dynamic therapies, specific and non-specific elements contribute to therapeutic change. In groups, the presence of other people adds to factors present in all dyadic healing relationships. Non-specific factors are embedded in the relationships established through a consistent, accepting, non-judgemental, and supportive environment. These are all elements of a cohesive group. Groups provide a corrective emotional experience in which patients experience others (including the therapist) responding to them differently from those in their past. Members share their stories (catharsis) and feel less isolated when others have shared similar stories (universalization); they have opportunities to be helpful to others through both cognitive understanding and emotional linking (imparting information, providing feedback, and altruism). They also see others improve, which conveys hope. These elements contribute to the sense of collaboration and a willingness to adopt norms (i.e. discuss feelings about the interactions in the meeting) that further members' sense of efficacy and belonging. They contribute to an experience of support and acceptance, which may be sufficient therapeutic gain for a number of patients. Fight/flight, pairing, and dependency are Bion's basic group assumptions that lead to a negative therapeutic effect.

Tasman A, Maj M, First MB, et al. *Psychiatry*, 3rd edn. WileyBlackwell, 2007, p. 1908.

38.A. Permissiveness is the principle where members tolerate behaviour that they may not accept elsewhere. This is also helped by the members having the opportunity to be helpful to others through both cognitive understanding and emotional linking (imparting information, providing feedback, and altruism). Mutual help is the process by which members support each other and help each other to change. Imitation is the conscious emulation of one's behaviour following that of another – also called role modelling. Altruism is the process of putting another person's need ahead of one's own and in the process learning there is value in giving to others.

Gelder M, Harrison P, and Cowen P. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 608.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 937.

39.B. Circular questioning is often used in family therapy as part of assessment. The purpose is to discover and clarify confused or conflicting views among the members of the family. Following this, a hypothesis is constructed about family functioning, which is then presented to the family, who should consider it between sessions. The family may be asked to try to behave in new ways. Paradoxical injunctions are used in couples therapy and family therapy. They are provocative statements designed to elicit a beneficial counter-response that the couple have previously resisted. Very often, this will include a prescription of the 'unwanted symptom', which the couple realize and try to give reasons why this is acceptable to the couple. Socratic questioning is a technique used in cognitive therapy. Role reversal is a technique in couples therapy which helps one partner to understand the point of view and experience of the other.

Gelder M, Harrison P, and Cowen P. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 612.

40.C. Family therapy is mostly employed in child psychiatry settings, when problems have usually been identified in a child's behaviour, which has led the family to seek help. The aim of family therapy is to improve family functioning and so help the identified patient. The goals of family therapy include (1) improved communications; (2) improved autonomy for each member; (3) improved agreement about roles; (4) reduced conflict; (5) reduced distress in the member who is the patient. Family therapy developed from Ackerman's work on psychodynamics of family and Bateson's work on communication. Ackerman's work led to the development of psychodynamic methods of treatment, while Bateson's work led to the system's approach. Minuchin developed further the system's approach in the USA to form the structural family therapy method.

Gelder M, Harrison P, and Cowen P. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 611.

41.A. Cognitive analytical therapy was first developed by Ryle as a brief form of therapy. The therapy is based on the principle that purposeful behaviour activity always follows a sequence. These sequences can be faulty in three ways. Traps are repetitive cycles of behaviour in which the consequence of the behaviour perpetuates it. For example a depressed student is hopeless and stops studying for his exam. He fails the exam, and feels more hopeless and depressed. Dilemmas are false choices or unduly narrowed options. For example, people who fear angry feelings may think they have to choose between placation and aggression. They choose to placate others who then take advantage of them, thus making them even angrier. Snags are the anticipation of highly negative consequences of action such that the action is never carried out and therefore never subject to a reality check.

Gelder M, Harrison P, and Cowen P. *Shorter Oxford Textbook of Psychiatry*, 5th edn. Oxford University Press, 2006, p. 601.

42.D. Collaborative empiricism is a term used in cognitive therapy to describe the therapeutic relationship with a high degree of collaboration and an experimental but pragmatic tone to the therapy. This allows the therapist to formulate hypotheses and helps the client to test the validity of the hypotheses, thus actively contributing to the client's therapy. It does not necessarily mean that the client and the therapist must agree with each other on every aspect of the therapy. In addition, the therapist need not collude with dysfunctional assumptions the client holds in order to achieve the collaboration.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 964.

43.C. Psychodrama is a method of group psychotherapy originated by Jacob Moreno, a Viennese-born psychiatrist. In this type of psychotherapy, the personality make-up, interpersonal relationships, conflicts, and emotional problems are explored by means of special 'dramatic' methods. Therapeutic dramatization of emotional problems includes the 'protagonist' or patient, the person who acts out his/her problems. The enactment is carried out with the help of 'auxiliary egos', people who enact varying aspects of the patient. The therapist takes up the role of the 'director' and guides those in the drama towards the acquisition of insight. Situations are chosen by the protagonist – this usually focuses on any special area of functioning or symptoms. The auxiliary ego takes on the role of other significant people in the protagonist's life. The therapist directs the situations, and the group can comment on various ways in which the protagonist deals with the situation he/she is in. Techniques to advance the therapeutic process and to increase productivity and creativity include the soliloquy (a recital of overt and hidden thoughts and feelings), role reversal (the exchange of the patient's role for the role of a significant person), the double (an auxiliary ego acting as the patient), the multiple double (several egos acting as the patient did on varying occasions), and the mirror technique (an ego imitating the patient and speaking for him or her). Other techniques include the use of hypnosis and psychoactive drugs to modify the acting behaviour in various ways.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 939.

44.B. This is called applied tension. Unlike those with other specific phobias who show an increase in sympathetic output on exposure to phobic stimuli, patients with blood–injury–injection phobia show a unique, biphasic response. The first phase is associated with increased heart rate and blood pressure. In the second phase, however, the blood pressure suddenly falls and the patient faints. To treat the problem, patients are shown a series of slides that are provocative (e.g. mutilated bodies). They are trained to identify early-warning signs of fainting, such as queasiness, cold sweats, or dizziness. They also learn how to apply the learned muscle tension response quickly, contingent on these warning signs. Patients can also perform applied tension while donating blood or watching a surgical operation. The technique of isometric tension raises blood pressure, which prevents fainting.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 952.

45.B. The acronym FRAMES captures the essence of a number of interventions commonly used under the terms 'brief intervention'. These are interventions that cover a range from one 5-minute interaction to several 45-minute sessions. The major positive studies discussed in this section typically consist of one interaction lasting between 5 and 20 minutes, sometimes with one brief follow-up contact. The acronym FRAMES stands for: feedback: about personal risk or impairment; responsibility: emphasis on personal responsibility for change; advice: to cut down or abstain if indicated because of severe dependence or harm; menu: of alternative options for changing drinking pattern and, jointly with the patient, setting a target; intermediate goals of reduction can be a start; empathic interviewing: listening reflectively without cajoling or confronting; exploring with patients the reasons for change as they see their situation; self-efficacy: an interviewing style that enhances people's belief in their ability to change. 'Rolling with resistance' is a part of Miller and Rollnick's motivational interviewing.

SIGN guidelines No: 74; The management of harmful drinking and alcohol dependence in primary care. <http://www.sign.ac.uk/guidelines/fulltext/74/index.html>

46.B. Treatment of borderline personality disorder is organized around the level of the disorder, with each level corresponding to one of four stages of treatment with specific goals that are targeted towards core deficits seen in these patients.

Stage I: In the first stage of treatment, the therapist seeks to increase behavioural control through helping patients attain basic capacities. This is targeted towards the severe 'behavioural dyscontrol' exhibited by the patient.

Stage II: The second stage targets 'quiet desperation'. The intent in this stage is to facilitate emotional experiencing through reducing post-traumatic stress and blocking dissociation. The principal goal of this stage is to block avoidance of emotions and the environmental cues associated with them. In this stage, patients are helped to experience their feelings without avoiding life or experiencing symptoms of post-traumatic stress disorder.

Stage III: The third stage is targeted towards 'problematic patterns in living'. The goal of this stage is to achieve 'ordinary happiness and unhappiness' through increasing self-respect and working on problems with relationships and career choices.

Stage IV: The fourth and final stage is directed towards 'incompleteness'. The goal of the last stage is to develop the patient's capacity for sustained experience of contentment, connection, and freedom.

Gabbard GO. *Textbook of Psychotherapeutic Treatments in Psychiatry*, 1st edn. American Psychiatric Publishing, 2008, p. 736.

47.A. The NICE recommends 'Watchful waiting' when symptoms are mild and have been present for less than 4 weeks after the trauma, with a follow-up contact within 1 month. NICE specifically asks therapists and clinicians not to routinely offer brief, single-session interventions (debriefing) that focus on the traumatic incident to that individual alone. Where symptoms are present for less than 3 months (as in the case with Rachel), NICE specifically recommends trauma-focused CBT (usually on an individual outpatient basis). Trauma-focused CBT is also recommended for people with 'severe' symptoms or 'severe' PTSD within 1 month. NICE recommends 8–12 weekly sessions of trauma-focused CBT, each session delivered by the same person and lasting around 90 minutes during which trauma is discussed. NICE advises against the use of non-directed therapies such as relaxation training. Where symptoms are milder and have lasted for more than 3 months, NICE recommends either trauma-focused CBT or EMDR. In addition to psychological treatments, NICE also recommends specific pharmacological interventions.

NICE. Clinical Guideline 26: Post-traumatic stress disorder (PTSD): the management of PTSD in adults and children in primary and secondary care. www.nice.org.uk/CG026NICEguideline

48.B. Biofeedback is the process where certain physiological parameters of an individual are recorded and displayed. It is usually used in combination with relaxation. This involves the recording of small changes in the physiological levels (induced by relaxation) of the feedback parameter. The display can be visual or auditory. Patients are instructed to change the levels of the physiological parameter, using the feedback from the display. It is based on the idea that the autonomic nervous system can come under voluntary control through operant conditioning. The feedback instrument used depends on the patient and the specific problem. The most effective instruments are the electromyogram (EMG), which measures the electrical potentials of muscle fibres; the electroencephalogram (EEG), which measures alpha waves that occur in relaxed states; the galvanic skin response (GSR) gauge, which shows decreased skin conductivity during a relaxed state; and the thermistor, which measures skin temperature (which drops during tension because of peripheral vasoconstriction). For example, in the treatment of bruxism, an EMG electrode is attached to the masseter muscle. The EMG emits a loud tone when the muscle is contracted and a low tone when at rest. Patients can learn to alter the tone to indicate relaxation. Patients receive feedback about the masseter muscle, the tone reinforces the learning, and the condition ameliorates.

Sadock BJ and Sadock VA. *Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry*, 10th edn. Lippincott Williams & Wilkins, 2007, p. 950.

49.B. Schemas determine our perceptions, assimilations, and actions upon the externally received information. These are developed through early experiences in childhood and formative influences thereafter. According to Beck, these are deeper cognitive structures than the negative automatic thoughts that are readily observable in clients undergoing cognitive behavioural therapy. Everyone interacts with the external world by utilizing his/her set of schemas. Most of these are simple schemas that do not contribute to any psychopathology. So schemas are conditional rules ('if–then statements') while the others are core beliefs about oneself ('I am good-looking', 'I cannot write a poem', etc). Clients requiring CBT often have a cluster of maladaptive schemas that perpetuate depression or anxiety state.

Kaplan HI. *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 8th edn. Lippincott Williams & Wilkins, 2004. p. 2516.

50.C. Clients with generalized anxiety often have an attentional bias that sensitizes them to respond to potentially threatening stimuli in the environment. Such attentional biases towards threatening information are also noted in individuals with high trait anxiety and may play an important role in the development of clinical anxiety disorders and maintenance of anxiety. Experimentally, dot probe tasks have been used to demonstrate such biases. Clients with depression often underestimate positive aspects of life, e.g. downplaying positive feedback but continuing with a sense of failure and hopelessness. They might also exhibit absolute thinking favouring negative themes – this is termed as black and white thinking.

Koster EH, Crombez G, Verschueren B, et al.. Attention to threat in anxiety-prone individuals: mechanisms underlying attentional bias. *Cognitive Therapy and Research* 30: 635–643.

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chapter
8

BASIC STATISTICS

QUESTIONS

- 1. A study is evaluating the effect of agomelatine on postnatal depression at a mother and baby unit. Which one of the following should be considered when assessing the internal validity of this study?**
 - A. Benefits of agomelatine in major depression outside the postpartum period
 - B. The degree to which the subjects adhered to the study protocol
 - C. The cost of using agomelatine compared with standard care
 - D. Consistency of the reported outcome in comparison with previous studies
 - E. Benefits of agomelatine in postpartum depression when used at an outpatient service
- 2. A new clinician-administered test for assessing suicidal risk is studied in a prison population in Canada, where a high suicide rate of 1 in 25 has been recorded. Which of the following indicate that this test is NOT suitable for your clinical population?**
 - A. The positive predictive value is 80%
 - B. The likelihood ratio for a positive test is 14
 - C. The prevalence of suicide in your clinical sample is 1 in 890
 - D. The inter-rater reliability (kappa) of the test is 0.8
 - E. The literacy rate of the prison population is very low but comparable with your clinical sample
- 3. A new rating scale being evaluated for anxiety has a sensitivity of 80% and specificity of 90% against the standard ICD-10 diagnosis. The likelihood ratio of a positive result is**
 - A. Nearly 2
 - B. Nearly 0.2
 - C. 0.08
 - D. 8
 - E. 0.5

4. A pharmaceutical company developed a new antidepressant 'X'. They conducted a randomized double-blind placebo controlled trial of the drug. The study had two arms: an active medication arm and a placebo arm. Each arm had 100 subjects. Over a 4-week period, a 50% drop in Hamilton depression scale (HAMD) scores were seen in 40 subjects in the active medication arm, while a similar drop was seen only in 20 subjects in the placebo arm. What is the number needed to treat (NNT) from this trial for the new antidepressant?
- A. 1
B. 2
C. 3
D. 4
E. 5
5. During the same placebo controlled trial described in question 4, 20% of people on X developed active suicidal ideas, while only 10% of patients on placebo developed the same side-effect. What is the number needed to harm (NNH) associated with the suicidal ideas from the trial data?
- A. 5
B. 10
C. 15
D. 20
E. 25
6. The prevalence of depression in patients with mild cognitive impairment is 10%. On applying a depression rating scale with the likelihood ratio of a positive test (LR^+) equal to 10, a patient with mild cognitive impairment becomes test positive. The probability that this patient is depressed is equal to
- A. 15%
B. 32%
C. 52%
D. 85%
E. 100%
7. A multi-centre double blind pragmatic randomized controlled trial (RCT) reported remission rates for depression of 65% for fluoxetine and 60% for dosulepin. The number of patients that must receive fluoxetine for one patient to achieve the demonstrated beneficial effect is
- A. 60
B. 20
C. 15
D. 10
E. 5

- 8. In a randomized double-blind trial two groups of hospitalized depressed patients treated with selective serotonin reuptake inhibitors (SSRIs) are evaluated for beneficial effects on insomnia of trazodone vs temazepam. Which of the following is NOT an important factor when evaluating the internal validity of results obtained from the above study?**
- A. Baseline differences in antidepressant therapy between the two groups
 - B. The method used to randomize the sample
 - C. Setting in which the study takes place
 - D. Sensitivity of the insomnia scale to pick up changes in severity
 - E. Inclusion of the data in final analysis from patients who have dropped out
- 9. While adapting the results of an RCT into clinical practice, a clinician wants to calculate the new NNT values for his own clinical population using the results of the RCT. Apart from the reported RCT which of the following is needed to carry out the calculation of the new NNT?**
- A. The expected rate of spontaneous resolution of the treated condition in the clinical population
 - B. The size of the clinical population
 - C. The case fatality rate for the treated condition in the clinical population
 - D. Lifetime prevalence of the disease in the clinical population
 - E. All of the above
- 10. In an attempt to ensure equivalent distribution of potential effect-modifying factors in treating refractory depression, a researcher weighs the imbalance that might be caused whenever an individual patient enters one of the two arms of the study. Every patient is assigned to the group where the least amount of imbalance will be caused. This method is called**
- A. Stratification
 - B. Matching
 - C. Minimization
 - D. Randomization
 - E. Systematic sampling
- 11. The effectiveness of an intervention is measured by using pragmatic trials. Which trial design is normally employed when carrying out a pragmatic trial?**
- A. RCT
 - B. Meta analysis
 - C. Systematic review
 - D. Cohort study
 - E. Case series

- 12. The probability of detecting the magnitude of a treatment effect from a study when such an effect actually exists is called**
- A. Validity
 - B. Precision
 - C. Accuracy
 - D. Power
 - E. Yield
- 13. Power is the ability of a study to detect an effect that truly exists. Power can also be defined as**
- A. Probability of avoiding type 1 error
 - B. Probability of committing type 1 error
 - C. Probability of committing type 2 error
 - D. Probability of detecting a type 2 error
 - E. Probability of avoiding type 2 error
- 14. A new diagnostic test detects 60 out of 100 schizophrenia patients correctly. It does not wrongly diagnose anyone in a sample of 100 controls. The positive predictive value of this test is**
- A. 50%
 - B. 60%
 - C. 40%
 - D. 100%
 - E. 0%
- 15. A new diagnostic test detects 60 out of 100 schizophrenia patients correctly. It does not wrongly diagnose anyone in a sample of 100 controls. How sensitive is this test in detecting schizophrenia?**
- A. 60%
 - B. 40%
 - C. 100%
 - D. 90%
 - E. 0%
- 16. A new diagnostic test detects 60 out of 100 schizophrenia patients correctly. It does not wrongly diagnose anyone in a sample of 100 controls. How accurate is this test in detecting schizophrenia?**
- A. 100%
 - B. 80%
 - C. 60%
 - D. 40%
 - E. 70%

- 17. A new diagnostic test detects 60 out of 100 schizophrenia patients correctly. It does not wrongly diagnose anyone in a sample of 100 controls. What are the chances that the test will turn negative in your next patient with schizophrenia?**
- A. 100%
 - B. 70%
 - C. 60%
 - D. 40%
 - E. 30%
- 18. Which of the following properties of a screening test increases with increasing disease prevalence in the population?**
- A. Negative predictive value
 - B. Sensitivity
 - C. Specificity
 - D. Accuracy
 - E. Positive predictive value
- 19. Two observers are rating MRI scans for the presence or absence of white matter hyperintensities. On a particular day from the records, they are observed to have an agreement of 78%. If they could be expected to agree 50% of the time, even if the process of detecting hyperintensities is by pure chance, then the value of kappa statistics is given by**
- A. 50%
 - B. 44%
 - C. 56%
 - D. 78%
 - E. 22%
- 20. The number of days that a series of five patients had to wait before starting cognitive behavioural therapy (CBT) at a psychotherapy unit is as follows: 12, 12, 14, 16, and 21. The median waiting time to get CBT is**
- A. 15 days
 - B. 12 days
 - C. 14 days
 - D. 21 days
 - E. 13 days
- 21. The number of days that a series of five patients had to wait before starting CBT at a psychotherapy unit is as follows: 12, 12, 14, 16, and 21. The mean waiting time to get CBT is**
- A. 15 days
 - B. 12 days
 - C. 14 days
 - D. 21 days
 - E. 13 days

22. The most clinically useful measure that helps to inform the likelihood of having a disease in a patient with positive results from a diagnostic test is
- Accuracy
 - Positive predictive value
 - Sensitivity
 - Specificity
 - Reliability
23. Zarkin et al., 2008 reported the cost-effectiveness comparison of naltrexone and placebo in alcohol abstinence. The mean effectiveness measured as percentage days of abstinence was nearly 80% for naltrexone group while it was 73% for the placebo group. The mean cost incurred for the placebo group was \$400 per patient. The naltrexone group incurred a cost of 680 per patient. How much additional cost needs to be spent per patient for each percentage point increase in total days of abstinence when using naltrexone compared with placebo?
- \$40
 - \$50
 - \$7
 - \$500
 - \$2
24. Two continuous variables A and B are found to be correlated in a non-linear fashion. All of the following can be considered as suitable statistical techniques for examining this relationship except
- Curvilinear regression
 - Logistic regression
 - Multiple linear regression
 - Polynomial regression
 - Exponential regression
25. A drug representative presents data on a new trial. The data show that drug A prevents annual hospitalization in 20% more dementia patients than placebo. You are very impressed but your consultant wants to know how many patients you need to treat to prevent one hospitalization. The correct answer is
- 20
 - 5
 - 80
 - 1
 - 100

26. A new study attempts to evaluate the benefits of regular exercise in preventing depression compared with unmodified lifestyle in a sample of 80 healthy elderly men. Which of the following is not possible in such a study design?

- A. Randomized trial
- B. Allocation concealed trial
- C. Prospective trial
- D. Double-blinded trial
- E. Controlled trial

27. When searching medical databases, the term MeSH refers to

- A. Software that distributes all indexed articles
- B. A keyword that will retrieve all published articles by an author
- C. A thesaurus of medical subject headings
- D. A keyword that stops ongoing search process
- E. A database of mental health and social care topics

28. Which of the following is strictly correct about a single-blind study design?

- A. Only the patients, but not the researchers, do not know whether placebo or active drug is being administered
- B. Only the researchers, but not the patients, do not know whether placebo or active drug is being administered
- C. Both the patient and researchers do not know the treatment given
- D. Only one group of the trial subjects is kept unaware of the treatment status
- E. Either the patients or the researchers do not know whether placebo or active drug is administered

29. Which one of the following correctly describes a crossover trial?

- A. Halfway through the treatment phase, the subjects from both arms interchange randomly
- B. Each subject receives both intervention and control with a washout period in between
- C. Controls from one trial are shared with another trial where a different drug is evaluated simultaneously
- D. The trial permits investigation of the effect of more than one independent variable on the clinical outcome
- E. None of the above

30. A study evaluates the effect of various psychological interventions on bulimia. This study could be termed as a factorial design if

- A. Halfway through the treatment phase, the subjects from two arms interchange randomly
- B. Each subject receives both intervention and control with a washout period in between
- C. Controls from one trial are shared with another trial where a totally different psychotherapy is evaluated simultaneously
- D. The trial permits investigation of the effect of more than one psychotherapy, both separately and combined, on the clinical outcome.
- E. None of the above

31. A 2×2 contingency table is constructed to analyse the primary outcome data of a trial. The degrees of freedom to use chi-square statistics is

- A. 1
- B. 2
- C. 3
- D. 4
- E. -4

32. Which one of the following is correctly matched with the most suitable study method?

- A. Diagnostic test: case-control study
- B. Prognosis: prospective cohort study
- C. Therapy: cross-sectional survey
- D. Aetiology: case-series study
- E. Epidemiology: RCT.

33. Which of the following characters of a pragmatic RCT distinguishes it from an explanatory RCT?

- A. Pseudo-randomization is practised in pragmatic trials
- B. Type 1 error level is set to be higher in pragmatic trials
- C. Descriptive rather than inferential statistics are used to report the outcome of pragmatic trials
- D. Higher generalizability is achieved in pragmatic trials
- E. Strict exclusion of patients with comorbid conditions is seen in pragmatic trials

34. Which one of the following statement with respect to bias is false?

- A. Bias is a systematic error
- B. Bias cannot be controlled for during the analysis stage of a trial
- C. The presence of bias always overestimates the final effect
- D. Blinding reduces measurement bias
- E. Randomization reduces selection bias

35. Which one of the following is NOT a major disadvantage of a double blind, well-concealed RCT design?

- A. Very expensive to carry out
- B. May become time consuming
- C. Experimental results may not translate to clinical samples
- D. Randomization may be unethical and not possible in certain cases
- E. Introduction of recall bias

36. The last observation carried forward (LOCF) method is not suitable for processing the data for which of the following RCTs with intention to treat analysis?

- A. Benzodiazepines for anxiety
- B. SSRIs for depression
- C. Venlafaxine for generalized anxiety disorder
- D. Memantine for Alzheimer's disease
- E. Risperidone for bipolar disorder

37. All of the following measures can be used to decrease the heterogeneity in a meta-analysis except

- A. Transformation of the outcome variable in question
- B. Employing meta regression analysis
- C. Using a random effects model
- D. Doing a subgroup analysis
- E. Including data from smaller unpublished studies

38. Both odds ratios and relative risk are often used as outcome measures in published studies. Which of the following statement is true regarding these measures?

- A. The odds ratio cannot be calculated in cohort studies
- B. Incidence rate is required to calculate the odds ratio
- C. Relative risk cannot be calculated for case-control studies
- D. If the outcome of interest is very common, the odds ratio approximates relative risk
- E. The odds ratio cannot be used to study dichotomous outcomes

39. Which one of the following clinical question can be correctly addressed by a case-control design?

- A. Is it effective to use hyoscine patches in treating clozapine-induced hypersalivation?
- B. How many inpatients in wards for elderly people suffer from untreated hypercholesterolaemia at any given time?
- C. How rapidly will lithium discontinuation produce relapse of schizoaffective disorder?
- D. Are we at local community team compliant with the NICE guidelines for prescribing antipsychotics?
- E. Do patients with depression have more academic examination failures than their healthy siblings?

40. A 50-year-old man sustained significant memory loss following near-fatal carbon monoxide poisoning. Following discussion he agreed to take part in a double-blinded trial of donepezil vs placebo administered in six separate 4-week modules with a 2-week washout period in between. Neuropsychological measures were obtained at regular pre-planned intervals to monitor changes. He was the sole subject on the trial and the randomization sequence was generated and maintained by the pharmacy. This study design could be best described as

- A. Uncontrolled trial
- B. N-of-1 trial
- C. Crossover RCT
- D. Pragmatic RCT
- E. Naturalistic observational study

41. While conducting a systematic review, publication bias could be determined using which of the following methods?

- A. Funnel plot
- B. Galbraith plot
- C. Fail-safe N
- D. Soliciting and comparing published vs. unpublished data
- E. All of the above

42. In a RCT the randomization sequence is protected before and until the randomization is completed. This is known as

- A. Concealment
- B. Double blinding
- C. Matching
- D. Masking
- E. Trial independence

43. Data collected for a study on antidepressant efficacy show the outcome as observations of the number of days needed to achieve remission. The standard deviation for such observations will be measured in which of the following units?

- A. No units
- B. Days
- C. Square root of days
- D. Days square
- E. Person-years

- 44. In a study presenting outcome in terms of median days of hospital admission, the collected data show many observations substantially higher than the median. Which one of the following is correct regarding the above study?**
- A. The results are negatively skewed
 - B. Mean = median = mode
 - C. The results are not skewed
 - D. Mean > median
 - E. Mode = median
- 45. A trial is conducted to evaluate the efficacy of lamotrigine in patients with symptoms of recurrent depersonalization. While calculating the number of patients needed in the trial to demonstrate a meaningful effect, α level is set at 0.05. Which of the following is true regarding alpha (α)?**
- A. It is the probability of a type 2 error
 - B. It is the threshold for defining clinical significance
 - C. If $\alpha = 0.05$, there is a 5% chance that the null hypothesis is rejected wrongly
 - D. If $\alpha = 0.05$, then 5% of treated subjects will show absence of treatment effect.
 - E. None of the above
- 46. Which of the following is an agreed method of assessing the quality of conducting and reporting systematic reviews and meta-analyses?**
- A. ASSERT
 - B. CONSORT
 - C. QUOROM
 - D. SIGN
 - E. NICE
- 47. All of the following methods are used to assess heterogeneity in a meta-analysis except**
- A. Q statistic
 - B. I squared statistic
 - C. Galbraith plot
 - D. L'Abbé plot
 - E. Paired t statistics
- 48. Which one of the following types of data can have potentially infinite number of values?**
- A. Continuous
 - B. Categorical
 - C. Nominal
 - D. Ordinal
 - E. Binary

- 49. A multi-centre RCT was conducted with strict inclusion criteria. Which one of the following properties of the study is most likely to be affected by the stringent inclusion criteria?**
- A. Generalizability of results
 - B. Precision of results
 - C. Accuracy of the results
 - D. Statistical significance of the results
 - E. All of the above
- 50. A researcher is interested in studying whether maternal smoking increases the risk of school refusal in children. Which one of the following is the correct null hypothesis for the above research question?**
- A. School refusal increases the risk of maternal smoking
 - B. Maternal smoking decreases the risk of school refusal
 - C. Maternal smoking does not increase the risk of school refusal
 - D. Maternal smoking increases the risk of school refusal
 - E. None of the above
- 51. From the following example, the most important methodological challenge while conducting a cohort study is**
- A. Statistical analysis of the results
 - B. Randomization of the cohorts
 - C. Identifying those who develop the outcome
 - D. Identifying a suitable comparison group
 - E. Concealment of cohort allocation
- 52. In a study investigating the mean cholesterol levels in 36 patients taking olanzapine, the mean was found to be 262 mg/dL. The standard deviation of this observation was 15 mg/dL. The 95% confidence interval for this observation is are**
- A. 232–292 mg/dL
 - B. 247–277 mg/dL
 - C. 259.5–264.5 mg/dL
 - D. 257–267 mg/dL
 - E. 226–298 mg/dL
- 53. In a normal distribution curve, 99% of observations will fall within which of the following values of standard deviation (SD)?**
- A. -2 SD to +2 SD
 - B. -3 SD to +3 SD
 - C. -1 SD to +2 SD
 - D. -1 SD to +1 SD
 - E. +1 SD to +3SD

54. Confidence intervals are used to describe the range of uncertainty around the estimated value of an outcome from the sample studied. Which of the following statements about confidence intervals is incorrect?

- A. Sample size is used in calculating confidence intervals
- B. It includes a range of values above and below the point estimate
- C. If the confidence interval includes a null treatment effect, the null hypothesis can be rejected
- D. 95% confidence interval is often used in clinical studies
- E. When the estimated outcome is a ratio, a positive treatment effect is shown by confidence intervals remaining above one.

55. A clinical researcher is examining the incidence of akathisia in two groups of patients. One group ($n = 35$) has been prescribed benzodiazepine for use as required while the other group ($n = 35$) is free from any benzodiazepine exposure. The outcome is measured as proportion of patients who develop akathisia in a dichotomous scale. Akathisia develops in 10 patients without benzodiazepines and in 20 patients with benzodiazepines. Which of the following statistical tests is best suited to analyse the statistical significance of the difference between the two groups?

- A. Chi square test
- B. Paired t test
- C. Multiple regression analysis
- D. Wilcoxon rank sum test
- E. Pearson coefficient test

56. Considering normal distribution, which one of the following statements is incorrect?

- A. It is a continuous distribution
- B. It is symmetrical in shape
- C. The mean, median, and mode are identical
- D. The shape of the distribution depends on the number of observations made
- E. Both tails of the distribution extend to infinity

57. In descriptive statistics, which of the following is the most widely used measure of dispersion of a frequency distribution?

- A. Range
- B. Median
- C. Standard deviation
- D. Variance
- E. p Value

- 58. In qualitative research which of the following refers to modifying the research methods and hypothesis as and while one conducts the research?**
- A. Triangulation
 - B. Iterative approach
 - C. Theoretical sampling
 - D. Content analysis
 - E. Deductive approach
- 59. Systolic blood pressure is known to be normally distributed across the population with a mean of 120 mmHg and standard deviation of 10 mmHg. How many out of 100 patients in a population will have systolic blood pressure between 120 and 130 mmHg?**
- A. 68
 - B. 97
 - C. 48
 - D. 17
 - E. 34
- 60. In which of the following situations is intention to treat analysis deliberately not attempted even if there are significant numbers of drop-outs?**
- A. A study that analyses the efficacy of an intervention itself
 - B. A study that analyses the effectiveness of providing an intervention
 - C. A study that compares two interventions for economic efficiency
 - D. A study that compares an established standard treatment against a new treatment with the view of replacing the standard
 - E. None of the above
- 61. A 24-week RCT of memantine in moderate–severe Alzheimer’s dementia was reported. The investigators recruited 126 subjects for the memantine arm and 126 for the placebo arm, out of which 100 in the memantine group and 100 in the placebo group completed the study. Using a categorical measure of treatment response it was shown that 40% of the patients in the memantine group responded while only 20% in placebo group showed a response. Calculate the relative risk reduction of using memantine**
- A. 20
 - B. 5
 - C. 2
 - D. 1
 - E. 10
- 62. Using the above study results calculate the number needed to treat (NNT) for patients receiving memantine compared with placebo**
- A. 20
 - B. 5
 - C. 2
 - D. 10
 - E. 7

63. If the above study used a per protocol analysis of primary outcome, the odds ratio of having a response is

- A. 2.7
- B. 7.2
- C. 0.16
- D. 6
- E. 0.37

64. Which one of the following measures is used in correlation analysis for non-parametric data?

- A. Kappa statistics
- B. Pearson's correlation
- C. Spearman's correlation
- D. Cohen's d
- E. Cronbach's alpha

65. Parametric statistical methods make assumptions, which when satisfied make the final estimate precise and accurate. Which of the following is one such parametric assumption?

- A. The distribution of observations in the population is not known
- B. The variance of the compared samples are homogeneous
- C. The analysed variables are categorical measures
- D. Outliers are unequally distributed
- E. The sample size is at least 2% of the size of target population

66. In a study comparing drug A and a placebo control, 20 out of 200 patients taking drug A die after 3 years. Twenty-five out of 225 patients taking the placebo die after 3 years. If death is the outcome of interest, the control event rate is given by

- A. 25/225
- B. 20/200
- C. $(25 - 20)/200$
- D. $(25 - 20)/225$
- E. 25

67. In an RCT comparing the effect of exposure therapy versus cognitive restructuring, follow-up was carried out at 6, 11, 24, and 36 weeks. At weeks 6 and 11, after rating the patient, the outcome assessors tried to guess the treatment condition. Correctness of guesses did not differ significantly from that expected by chance. This was an attempt to demonstrate which of the following?

- A. Adequacy of randomization
- B. Concealment of allocation
- C. Blindness of assessor
- D. Blindness of patient
- E. Matching of two groups

68. If the sample size is sufficiently large, mean values of repeated observations follow normal distribution irrespective of the distribution of original data in the population. This is known as

- A. Bayesian theorem
- B. Central limit theorem
- C. Bonferroni correction
- D. Transformation theorem
- E. Independent observations theorem

69. The validity of a new instrument is compared with an external criterion.

A conceptually related external criterion is identified to occur sometime in the future. If the correlation between current scores obtained using the instrument and the future expected outcome is studied, this is called

- A. Concurrent validity
- B. Incremental validity
- C. Predictive validity
- D. Inter-rater reliability
- E. Internal consistency

70–82 A recent study conducted in a palliative care unit assessed the use of a two-item questionnaire to screen for the presence of depression. Given below is the table which compares the result of the screen to the gold standard (DSM-IV) diagnosis. In relation to this table, answer questions 70–82

Overall screen (2 questions)	Actual case of major depressive disorder (DSM-IV)		Total
	Depressed	Not depressed	
Yes	39	40	79
No	4	84	88
Total	43	124	167

Payne A, Barry S, Creedon B, et al. Sensitivity and specificity of a two-question screening tool for depression in a specialist palliative care unit *Palliative Medicine* 2007; **21**: 193.

70. The sensitivity of the overall screen using both items is approximately

- A. 100%
- B. 25%
- C. 67%
- D. 76%
- E. 91%

71. The specificity of the overall screen is approximately

- A. 67%
- B. 95%
- C. 38%
- D. 25%
- E. 91%

72. The predictive power of a positive test using the overall screen is

- A. 49%
- B. 91%
- C. 67%
- D. 25%
- E. 95%

73. The predictive power of a negative test using the overall two-item screen is given by

- A. 49%
- B. 91%
- C. 67%
- D. 25%
- E. 95%

74. The pretest probability of the overall two-item screen is

- A. 49%
- B. 91%
- C. 67%
- D. 25%
- E. 95%

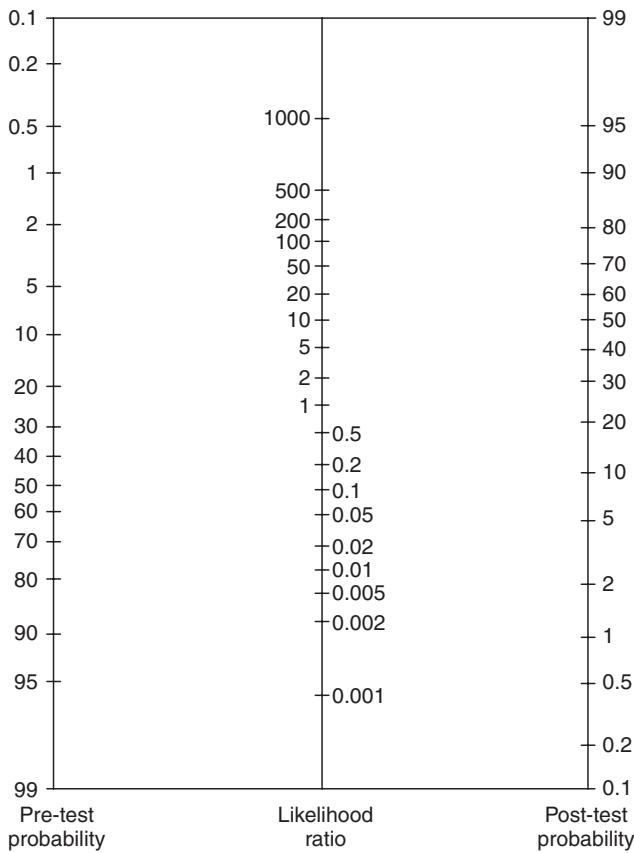
75. The likelihood ratio of a positive test for the overall two-item screen is

- A. 2.8
- B. 4.8
- C. 6.8
- D. 8.8
- E. 10.8

76. The likelihood ratio of a negative test (LR-) for the overall two-item screen is

- A. 0.14
- B. 0.34
- C. 0.54
- D. 0.74
- E. 0.94

77. Using the nomogram below, calculate the post-test probability of a positive test when using the two-item depression screening test in the palliative care unit using the figures indicated at the beginning of Question 70.



Fagan TJ. Nomogram for Bayes theorem (letter). *New England Journal of Medicine* 1975; **293**: 257.

- A. 1
- B. 2
- C. 4
- D. 10
- E. 50

78. Using the nomogram in Question 77, calculate the post-test probability of a negative test when using the two-item depression screening test in the palliative care unit

- A. 1
- B. 4
- C. 10
- D. 50
- E. 80

79. What is the false positive rate for the overall 2-items screening test?

- A. 32%
- B. 9%
- C. 90%
- D. 67%
- E. 25%

80. What is the false negative rate for the overall two-item screening test?

- A. 32%
- B. 9%
- C. 90%
- D. 67%
- E. 25%

81. Taking into consideration the above screening test, we randomly pick 1000 people from the general population. Considering the prevalence of a major depressive disorder using DSM-IV in the general population as 10%, calculate the positive predictive value of the 2-item screening test in the population?

- A. 49%
- B. 91%
- C. 67%
- D. 31%
- E. 95%

82. Taking into consideration the above screening test, we randomly pick 1000 people from the general population. Considering the prevalence of a major depressive disorder in the general population using DSM-IV as 10%, calculate the new negative predictive value of the two-item screening test in the population?

- A. 49%
- B. 91%
- C. 67%
- D. 30%
- E. 98%

83–86. The table below shows the adverse events reported during an RCT on sertraline for the prevention of relapse in detoxicated alcohol-dependent patients with a comorbid depressive disorder. Answer Questions 83–86 based on the data presented in the table

Adverse event	Placebo (n = 39)	Sertraline (n = 44)	Total (N = 83)
Headache	11	12	23
Influenza-like symptoms	6	6	12
Dizziness	5	5	10
Dyspepsia	2	6	8
Diarrhoea	3	4	7
Nausea	3	4	7

Gual AM, Balcells MM, Torres MM, et al. Sertraline for the prevention of relapse in detoxicated alcohol dependent patients with a comorbid depressive disorder: a randomized controlled trial. *Alcohol Alcohol* 2003; **38**: 619–625.

83. What proportion of patients develops dyspepsia after exposure to the sertraline?

- A. 13.6%
- B. 5%
- C. 8.6%
- D. 63.2%
- E. 90.2%

84. What proportion of dyspepsia will be eliminated if sertraline was not administered?

- A. 13.6%
- B. 5%
- C. 8.6%
- D. 63.2%
- E. 90.2%

85. How many times is a person on sertraline more likely to develop dyspepsia than a person on placebo?

- A. 1.7
- B. 2.7
- C. 3.7
- D. 4.7
- E. 5.7

86. How many times are the odds of being dyspeptic on sertraline higher than the odds of being dyspeptic on placebo?

- A. 1.9
- B. 2.9
- C. 3.9
- D. 4.9
- E. 5.9

87–91. The finding of a hypothetical cost-effectiveness analysis of a new model of psychotherapy in depression is shown in the table below

Treatment	Costs	Effect (number of depression-free weeks)
Antidepressants	£ 5,000	45 weeks
Psychotherapy (new treatment)	£ 10,000	50 weeks

87. Calculate the average cost-effectiveness ratio (ACER) for the new treatment?

- A. £200/week
- B. £100/week
- C. £50/week
- D. £111/week
- E. £20/week

88. Calculate the incremental cost-effectiveness ratio (ICER) for the new treatment

- A. £1000 per additional depression-free week
- B. £200 per additional depression-free week
- C. £111 per additional depression-free week
- D. £89 per additional depression-free week
- E. £600 per additional depression-free week

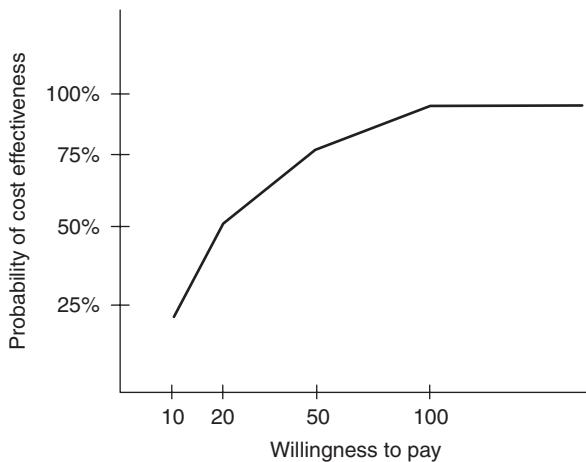
89. What is the incremental net benefit (INB) if the health commissioners are willing to pay around £1500 per additional depression free week?

- A. £500
- B. £1000
- C. £2500
- D. 5 weeks
- E. 1 week

90. After critically appraising the above cost-effectiveness analysis paper, managers of an NHS foundation trust decide to choose psychotherapy over antidepressants as the first-line management for depression. Which of the following statements best defines the opportunity costs?

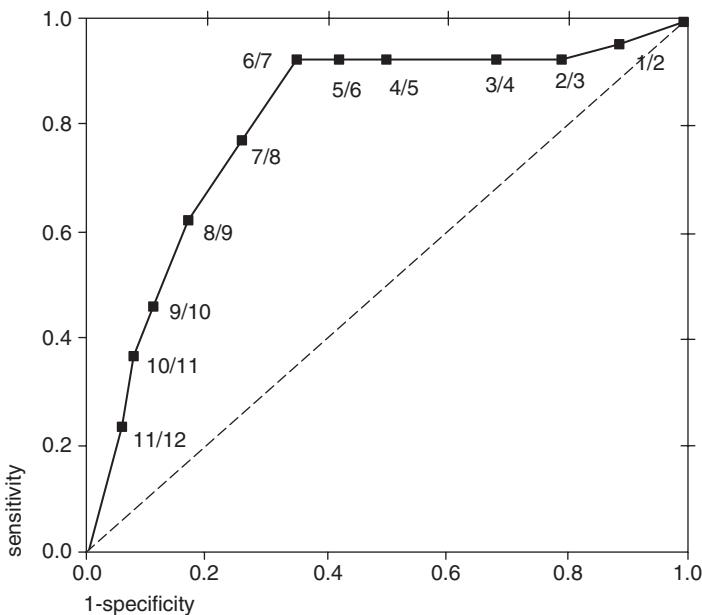
- A. The original cost incurred while providing psychotherapy as the first choice treatment
- B. The cost of providing psychotherapy instead of prescribing antidepressant drugs for depression
- C. The apparent cost of not providing antidepressants as the first choice of treatment.
- D. The cost of the using antidepressants in the absence of psychotherapy for depression.
- E. The cost of conducting this trial in order to make treatment recommendations

91. The given cost-effectiveness acceptability curve (CEAC) is drawn using the data from the hypothetical study on treatment of depression. What is the probability of cost-effectiveness if the society is willing to pay £150 for every depression-free day?



- A. >90%
- B. 75%
- C. 50%
- D. 25%
- E. <10%

92–96. A new 12-point scale with scores from 1 to 12 (1 being not depressed and 12 being the highest degree of depression) was developed to screen for depression in a population of patients with dementia. The scale was tested against the gold standard of DSM-IV in a small study. The neurologists using the test wanted a score that would identify a depressed person from a non-depressed based on this instrument. A statistician involved in the development of this instrument mailed the following graph to the neurologists. Answer Questions 96–99 based on the graph below.



92. What is the above graph called?

- A. Scatter plot
- B. Funnel plot
- C. Receiver operator characteristics curve
- D. Galbraith plot
- E. Forest plot

93. What does 1 – specificity represent?

- A. False-positive rate
- B. False-negative rate
- C. True-positive rate
- D. True-negative rate
- E. None of the above

94. What does the dotted line represent?

- A. It is the curve of the test that best discriminates depressed from non-depressed people
- B. It is the curve of a test that partially discriminates depressed from non-depressed people
- C. It is the curve of a test that does not discriminate depressed from non-depressed people
- D. It is the curve representing the application of the current screening instrument to the whole population
- E. It is the curve of a test with maximum sensitivity but minimum specificity

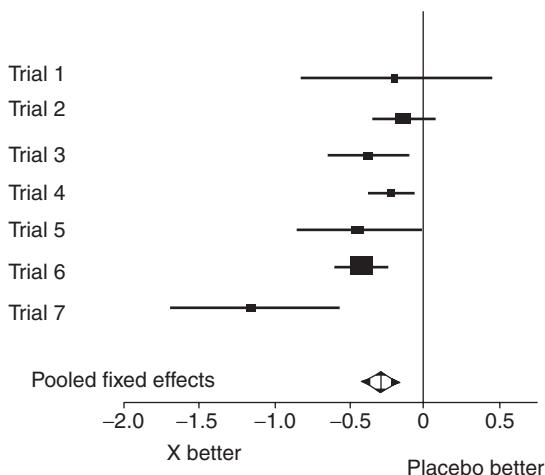
95. Which cut-off point provides the best acceptable combination of sensitivity and specificity?

- A. 1/2
- B. 8/9
- C. 3/4
- D. 5/6
- E. 6/7

96. If the area under the curve (AUC) for the new test was found to be 0.5, what does it mean?

- A. The test can discriminate a depressed from a non-depressed person with high accuracy
- B. The test can discriminate a depressed from a non-depressed person with moderate accuracy
- C. The test cannot discriminate a depressed from a non-depressed person
- D. The test is half as good as the gold standard test
- E. The test can identify 50% of depressed patients correctly.

97–99 A meta-analysis of seven RCTs that compared a new antidepressant X with placebo was conducted. Effect size analysis for the change in HAMD scores are shown in the graph above. With respect to the graph below, answer Questions 97–99.



97. What is the name of the graph shown above?

- A. Funnel plot
- B. Galbraith plot
- C. L'Abbé plot
- D. Scatter plot
- E. Forest plot

98. How many studies in the meta-analysis show statistically significant advantage for the new antidepressant?

- A. 1
- B. 2
- C. 4
- D. 6
- E. 7

99. Which of the trials has the greatest weight on the overall analysis?

- A. Trial 1
- B. Trial 3
- C. Trial 4
- D. Trial 6
- E. Trial 7

100. In which of the following situations is sensitivity analysis especially recommended while conducting a meta-analysis?

- A. Presence of a high degree of homogeneity
- B. Any meta-analysis of continuous data
- C. Any meta-analysis of economic data
- D. Presence of significant publication bias
- E. Pooled outcome showing a large effect of intervention

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1.B. Internal validity is the degree to which a study establishes the cause-and-effect relationship between the treatment and the observed outcome. External validity is the degree to which the results of a study becomes applicable outside the experimental setting in which the study was conducted. In other words, external validity refers to generalizability of study results while internal validity refers to rigorousness of the research method. The benefit of agomelatine in different populations (choices A and E) refers to external validity; the cost of the drug and consistency of results obtained from different studies are related to applicability of the intervention in a clinical setting. Assessment of adherence to study protocol is one of many ways of analysing the quality of an intervention trial.

Slack MK and Drugalis JR. Establishing the internal and external validity of experimental studies. *American Journal of Health-Systems Pharm* 2001; **58**: 2173–2184.

2.C. Having a high positive predictive value, a likelihood ratio more than 10, and good inter-rater reliability as measured by kappa are desirable properties of an instrument. But when the same instrument is applied to a population with much lower prevalence of suicide (the studied phenomenon), the post-test probability decreases substantially. Post-test probability is a measure of positive predictive value in the target population; it depends on pretest probability, i.e. the prevalence and likelihood ratio.

Guyatt G and Rennie D, eds. *Users' Guides to the Medical Literature. A Manual for Evidence-Based Clinical Practice*. AMA Press, 2002, p. 130.

3.D. The likelihood ratio of a positive test (LR+) is the ratio between the probability of a positive test in a person with disease and the probability of a positive test in a person without disease. It can also be expressed as

$$\text{LR+} = \text{sensitivity}/(1 - \text{specificity})$$

Here, sensitivity = 0.8; specificity = 0.9.

$$\text{Hence } \text{LR+} = 0.8/1 - 0.9 = 8.$$

Lawrie SM, McIntosh AM and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000. p. 97.

4.E. The NNT is the number of patients who will need the experimental treatment (X) for one additional patient to benefit compared with the control treatment. In the given trial, the response rate is characterized by a 50% drop in HAMD from baseline. Forty per cent of those taking drug X achieve this response. In contrast, this rate is 20% for the placebo. This means that 20% ($40 - 20\%$) additional patients responded to the drug compared with placebo. In other words, if we treat another 100 patients with X, 20 extra patients will respond to X than those treated with a placebo. So we need to treat at least five people in order to see a benefit in one additional patient. This value five is known as the NNT. This can be calculated in another way. As you read further, you will note that 20% is the absolute benefit increase ($ABI = EER - CER$). And from the formula, $NNT = 1/ABI$, we get $1/20\% = 5$.

Cook RJ and Sackett DL. The number needed to treat: a clinically useful measure of treatment effect. *British Medical Journal* 1995; **310**: 452–454.

5.B. NNH is similar to the NNT. NNH is the number of patients who need to take the experimental treatment for one additional patient to experience an adverse effect. In the question, 20% of participants on X experienced suicidal ideas compared with 10% on placebo. Put in other words, the drug is responsible for suicidal ideas in an extra 10% of patients. So, if 100 patients receive the drug, 10 extra patients will experience suicidal ideas. That is, for every 10 people treated, one additional patient will experience suicidal ideas. Hence the NNH is $100/10 = 10$. This obviously can be calculated from the formula $NNH = 1/ARI$ (absolute risk increase) $= 1/10\% = 10$. It is highly unlikely that X was marketed by the company.

Guyatt GH, Juniper EF, Walter SD, et al. Interpreting treatment effects in randomised trials. *British Medical Journal* 1998; **316**: 690–693.

6.C. This question tests one's ability to calculate post-test probability from likelihood ratios. The probability of having a disease after testing positive with a diagnostic test depends on two factors: (a) the prevalence of the disease, (b) the likelihood of a positive test result using the instrument. It is important to remember that baseline prevalence of a disease for which a diagnostic instrument is being tested is taken as the pretest probability.

So pretest probability = 10%

Now, post-test odds = likelihood ratio \times pretest odds

From a given probability odds can be calculated using the formula

odds = (probability)/(1 – probability)

Here pretest odds = $(10\%)/(1 - 10\%) = 10/90 = 1/9$.

Now post-test odds = likelihood ratio \times pretest odds

$= 10 \times 1/9 = 10/9$

Using the formula probability = odds/(1 + odds)

post-test probability = $(10/9)/[1 + (10/9)] = 10/19 = 52.3\%$

Guyatt G and Rennie D, eds. *Users' Guides to the Medical Literature. A Manual for Evidence-based Clinical Practice*. AMA Press, 2002, p. 660.

7.B. This question tests one's knowledge of the NNT (number needed to treat) concept. NNT is given by the inverse ratio of the absolute benefit increase (ABI) in therapeutic trials. ABI is the difference between benefit due to experimental intervention and the compared standard/placebo. Here it is given by $65\% - 60\% = 5\%$. If ABI = 5%, NNT = $100/5 = 20$.

Guyatt G. and Rennie, D eds. *Users' Guides to the Medical Literature. A Manual for Evidence-based Clinical Practice*. AMA Press, 2002, p. 660.

8.C. Threats to internal validity of an experimental study include confounding, selection bias, differential attrition, and quality of measurement. Having a significant difference in baseline SSRI therapy could explain differential outcomes in the trazodone vs temazepam groups. Similarly, poor randomization may lead to selection bias and influence the differences in outcome. Failure to account for differential drop-out rates may spuriously inflate or deflate the difference in outcome. Using a scale with poor sensitivity to change will reduce the magnitude of differences that could be observed. Given both groups are recruited from the same setting (hospital), this must not influence validity; on the other hand, this might well influence generalizability of results to the non-hospitalized population (external validity)

Campbell DT. Reforms as experiments. *American Psychologist* 1969; **24**: 409–429.

Slack MK and Drauglis JR. Establishing the internal and external validity of experimental studies. *American Journal of Health-System Pharmacy* 2001; **58**: 2173–2181.

9.A. Published RCTs may quote impressive outcomes in terms of NNT. Applying principles of evidence-based medicine, one must check for the internal validity of a study and the degree of generalizability before adapting the results to clinical practice. One must also be aware of the fact that though clinically more meaningful, NNTs quoted in RCTs may not translate to the same extent in actual clinical practice. One way of appreciating the usefulness of a newly introduced drug is to calculate the NNT for one's own clinical population (target population). To enable this one may estimate the patient expected event rate (PEER), which is given by the expected spontaneous resolution rate or the response rate for an existing standard treatment. This can be obtained from the local audit data or clinical experience. The product of PEER and relative benefit increase from the published RCT gives the new absolute benefit increase (ABI new) value for the target population. The inverse of the new ABI gives the new NNT for the target population. The disease prevalence rate or absolute size of the target population has no effect on the new NNT.

Lawrie SM, McIntosh AM, Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 117.

10.C. In most treatment trials interventions are allocated by randomization. Block randomization and stratified randomization can be used to ensure the balance between groups in size and patient characteristics. But it is very difficult to stratify using several variables in a small sample. A widely acceptable alternative approach is minimization. This method can be used to ensure very good balance between groups for several confounding factors irrespective of the size of the sample. With minimization the treatment allocated to the next participant enrolled in the trial depends (wholly or partly) on the characteristics of those participants already enrolled. This is achieved by a simple mathematical computation of magnitude of imbalance during each allocation.

Altman DG. and Bland JM. Treatment allocation by minimisation. *British Medical Journal* 2005; **330**: 843.

11.A. RCTs provide high-quality evidence for or against proposed interventions. But RCTs have a major limitation in terms of generalizability. This is because the trials are conducted in a somewhat artificial experimental setting that is different from clinical practice. So RCTs have high internal validity due to rigorous methodology but poor external validity. Pragmatic RCTs are a type of RCTs introduced with the intention of increasing external validity, i.e. generalizability of RCT results. But this takes place at the expense of internal validity. In pragmatic RCTs the trial takes place in a setting as close as possible to natural clinical practice, i.e. the inclusion and exclusion criteria are less fastidious, often 'treatment as usual' is employed for comparisons, instead of placebos and real world, functionally significant outcomes are considered.

Hotopf M. The pragmatic randomised controlled trial. *Advances in Psychiatric Treatment* 2002; **8**: 326–333.

12.D. The power of a study refers to the ability of the study to show the difference in outcome between studied groups if such a difference actually exists. The term power calculation is often used while referring to sample size estimation before a study is undertaken. In order to carry out power calculation one has to know the expected precision and variance of measurements within the study sample (obtained from a literature search or pilot studies), the magnitude of a clinically significant difference, the certainty of avoiding type 1 error as reflected by the chosen p value, and the type of statistical test one will be performing. There is no point in calculating the statistical power once the results of a study are known. On completion of trials, measures such as confidence intervals indicate the power of a study and the precision of results.

Jones S, Carley S, and Harrison M. An introduction to power and sample size estimation. *Emergency Medicine Journal* 2003; **20**: 453–458.

13.E. Power refers to the probability of avoiding a type 2 error. To calculate power, one needs to know four variables.

1. sample size
2. magnitude of a clinically significant difference
3. probability of type 1 error (significance level from which p value is derived)
4. variance of the measure in the study sample.

Underpowered trials are those that enrol too few participants to identify differences between interventions (arbitrarily taken as at least 80% of the time) when such differences truly exist. Underpowered RCTs are prone to false-negative conclusions (type 2 errors). Somewhat controversially, underpowered trials are considered to be unethical, as they expose participants to the ordeals of research without providing an adequate contribution to clinical development.

Jones S, Carley S, and Harrison M. An introduction to power and sample size estimation. *Emergency Medicine Journal* 2003; **20**: 453–458.

14.D. It is useful to construct a 2×2 table for calculating properties of reported diagnostic tests. From the given information we can draw the following:

	Schizophrenia	Controls	Total
Test positive	60	0	?
Test negative	?	?	?
Total	100	100	?

The remaining boxes can be filled as below

	Schizophrenia	Controls	Total
Test positive	60 (true positive)	0	60
Test negative	40	100 (true negative)	140
Total	100	100	200

Now, positive predictive value = true positive/total positive = $60/60 = 100\%$.

Guyatt G and Rennie D, eds. *Users' Guides to the Medical Literature. A Manual for Evidence-based Clinical Practice*. AMA Press, 2002, p. 661.

15.A. Using the table from question 14

	Schizophrenia	Controls	Total
Test positive	60 (true positive)	0	60
Test negative	40	100 (true negative)	140
Total	100	100	200

Sensitivity = true positive/total diseased (schizophrenia subjects) = $60/100 = 60\%$

Guyatt G and Rennie D, eds. *Users' Guides to the Medical Literature. A Manual for Evidence-based Clinical Practice*. AMA Press, 2002, p. 661.

16.B. Using the table from question 14,

	Schizophrenia	Controls	Total
Test positive	60 (true positive)	0 (false positive)	60
Test negative	40 (false negative)	100 (true negative)	140
Total	100	100	200

Accuracy = all true observations/total population studied = $(100 + 60)/200 = 160/200 = 80\%$

Guyatt G and Rennie D, eds. *Users' Guides to the Medical Literature. A Manual for Evidence-based Clinical Practice*. AMA Press, 2002, p. 661.

17.D. This question asks the candidate to calculate the probability of a negative test in someone with the disorder – false-negative rate (FNR).

	Schizophrenia	Controls	Total
Test positive	60 (true positive)	0 (false positive)	60
Test negative	40 (false negative)	100 (true negative)	140
Total	100	100	200

This is given by $FNR = \text{false negative}/\text{total diseased} = 40/100 = 40\%$

FNR is same as $(1 - \text{sensitivity})$; similarly false-positive rate (FPR) is same as $(1 - \text{specificity})$.

Guyatt G and Rennie D, eds. *Users' Guides to the Medical Literature. A Manual for Evidence-based Clinical Practice*. AMA Press, 2002, p. 661.

18.E. Sensitivity, specificity, and accuracy are measures that reflect the characteristics of the test instrument. These measures do not vary with changes in the disease prevalence. Positive predictive value increases while negative predictive value decreases with rising population prevalence of the disease studied. The prevalence can be interpreted as the probability before the test is carried out that the subject has the disease, known as the prior probability of disease. The positive and negative predictive values are the revised estimates of the same probability for those subjects who are positive and negative on the test, and are known as posterior probabilities. Thus the difference between the prior and posterior probabilities is one way of assessing the usefulness of the test.

Altman DG and Bland MJ. *Statistics Notes: Diagnostic tests 2: predictive values* *British Medical Journal* 1994; **309**:102.

19.C. Agreement between different observers can be measured using the kappa (κ) statistic for categorical measures such as the one highlighted in this question (presence or absence of MRI hyperintensities). Kappa is a measure of the level of agreement in excess of that which would be expected by chance. It is calculated as the observed agreement in excess of chance, expressed as a proportion of the maximum possible agreement in excess of chance. In other words $\kappa = \frac{\text{observed agreement} - \text{expected agreement}}{1 - \text{expected agreement}}$. In this example, the observed agreement is 78%. The expected agreement is 50%. Hence $\kappa = (0.78 - 0.50)/(1 - 0.50) = 0.28/0.50 = 56\%$.

Silman AJ and Macfarlane GJ. *Epidemiological studies: A Practical Guide*, 2nd edn. Cambridge University Press, 2004 p.125.

20.C. The median is calculated by placing observations in a rank order (either ascending or descending) and picking up the most central value. If the number of observations is even (multiples of two), then the median is taken as the arithmetic mean of the two middle values.

Lawrie SM, McIntosh AM, Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 60.

21.A. The arithmetic mean is calculated from the sum of all individual observations divided by the number of observations. Here the number of observations = 5. The sum of individual observations = $12 + 12 + 14 + 16 + 21 = 75$. The average = $75/5 = 15$.

Lawrie SM, McIntosh AM, Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 60.

22.B. The probability that a test will provide a correct diagnosis is **not given** by the sensitivity or specificity of the test. Sensitivity and specificity are properties of the test instrument – they are not functions of the target population/clinical sample. On the other hand, positive and negative predictive values are functions of the population studied; they provide much more clinically useful information. Predictive values observed in one study do not apply universally. Positive predictive value increases with increasing prevalence of the disease; negative predictive value decreases with increasing prevalence. Sensitivity and specificity, being properties of the instrument used, do not vary with prevalence.

Altman DG and Bland JM. Diagnostic tests. 2. predictive values. *British Medical Journal* 1994; **309**: 102.

23.A. The incremental cost-effectiveness ratio ($ICER_{AB}$) can be defined as the difference in cost (C) of interventions A and B divided by the difference in mean effectiveness (E), $(C_A - C_B)/(E_A - E_B)$, where intervention B is usually the placebo or standard intervention that is compared with intervention A. In this example, the difference in costs = $\$680 - 400 = \280 . The difference in effectiveness as measured by percentage days of abstinence is $80 - 73\% = 7\%$. Hence $ICER = 280/7 = \$40$ per patient per percentage point of days of abstinence.

Zarkin GA, Bray JW, Aldridge A, et al. Cost and cost-effectiveness of the COMBINE study in alcohol-dependent patients. *Archives of General Psychiatry* 2008; **65**: 1214–1221.

24.C. When the relationship between two continuous variables is plotted in a graph, the resulting distribution may be a straight line or a curve. If the relationship between the independent (X) variable and dependent (Y) variable appear to follow a straight line, then linear regression can be constructed to predict the dependent variable from the independent variable. Otherwise, one can resort to one of the following methods:

1. Attempting to transform the available data to straighten the curved relationship.
2. One can try curvilinear regression, e.g. logarithmic regression, exponential regression, and trigonometric regression.
3. Unless there is a theoretical reason for supposing that a particular form of the equation as mentioned above, such as logarithmic or exponential, is needed, we usually test for non-linearity by using a polynomial regression equation.
4. Multiple linear regression is often used to examine the linear relationships when there is more than one independent variable influencing a dependent variable.

Bland M. *An Introduction to Medical Statistics*, 3rd edn. Oxford University Press, 2000, p. 314.

25.B. The answer to this question can be found by calculating the number needed to treat (NNT). The absolute increase in benefit (ABI) is given by the difference in outcome between two groups. This is 20% as quoted by the drug representative. Hence $NNT = 100/20 = 5$. You need to treat five patients with the new drug to prevent one annual hospitalization. How small must the NNT be to be clinically impressive? This depends on the availability of other interventions and their NNTs, incremental cost of the proposed intervention, and tolerability of the intervention. The last one can be partly deciphered by calculating the number needed to harm for a notable side-effect of the intervention.

Guyatt G. and Rennie D, eds. *Users' Guides to the Medical Literature. A Manual for Evidence-based Clinical Practice*. AMA Press, 2002, p. 660.

26.D. Blinding reduces differential assessment of outcomes of interest (ascertainment bias, information bias, or observer bias) that can occur if the investigator or participant is aware of the group assignment. Blinding can also improve compliance and retention of trial participants and reduce unaccounted supplemental care or treatment that may be sought by the participants. Single blinding refers to either the investigator or the patient being blind to group assignment. Double blinding refers to both the patient and the investigator remaining unaware of the group assignment after randomization. This is desirable but not always possible in RCTs. In the example above, the subjects who undertake the exercise schedule cannot be kept unaware of exercising! A single-blind trial is possible in such cases.

Schulz KF and Grimes DA. Blinding in randomised trials: hiding who got what. *Lancet* 2002; **359**: 696–700.

27.C. MeSH stands for medical subject headings. It is a thesaurus embedded in the Pubmed–Medline interface and can be used to search literature more effectively using recognized key words.

Greenhalgh T. How to read a paper: the Medline database. *British Medical Journal* 1997; **315**: 180–183.

28.E. Single blind: either the patient or the clinician remains unaware of the intervention given.

Double blind: both the patient and investigator are unaware of the given intervention.

Open label: both researchers and the participants are aware of treatment being given after randomisation.

Triple blind: apart from the patient and the researcher, those who measure the study outcomes (the assessors) are also unaware of the given intervention.

Forder PM, Gebski VJ, and Keech AC. Allocation concealment and blinding: when ignorance is bliss. *Medical Journal of Australia* 2005; **182**: 87–89.

29.B. If random interchange between treatment and placebo groups occurs halfway through the study, this will lead to chaos and failed randomization. This is termed as contamination. This can occur when participants or their care givers discover they are ‘controls’, and obtain the experimental treatment outside the trial, thus effectively becoming the active treatment group. Choice C is practically impossible; to share controls of one RCT with another means the trial is open label. When each subject in the trial receives both intervention and placebo with a washout period in between while remaining blind to the intervention, this is called as crossover RCT. Crossover trials are possible only if short-term outcomes are evaluated in chronic diseases. This is because the disease process must be sufficiently long for the subject to receive both interventions across its course. Any intervention applied in a crossover setting must not permanently alter the disease process.

Sibbald B and Roberts C. Understanding controlled trials: Crossover trials. *British Medical Journal* 1998; **316**: 1719.

30.D. If one wishes to compare the effect of more than one intervention against placebo either a multi-arm RCT or a factorial design can be chosen. A multi-arm RCT is a simple extension of the usual RCTs where an extra arm of subjects is generated through randomization to allocate the second intervention in addition to placebo and the first intervention groups. A factorial RCT evaluates the effect of more than one intervention, independently and also in combination. In the above example the effect of two different psychotherapies independently and in combination could be studied using a factorial design.

Greenhalgh T. *How to Read a Paper: The Basics of Evidence Based Medicine*, 3rd edn. British Medical Journal, 2006, p. 45.

31.A. ‘Degree of freedom’ is defined as the number of values in the final calculation of statistics that are free to vary. In a two-way chi-square test, this is given by

$$\text{Degrees of freedom (d.f.)} = (\text{number of rows} - 1) \times (\text{number of columns} - 1)$$

In this question, for a 2×2 table, there are 2 rows and 2 columns. Hence

$$\text{d.f.} = (2 - 1) \times (2 - 1) = 1 \times 1 = 1.$$

Degrees of freedom cannot take negative values.

Starr M and Chalmers I. The evolution of The Cochrane Library, 1988–2003. Update Software: Oxford (Accessed 6 September 2008 www.update-software.com/history/clibhist.htm).

32.B. No single study design is sufficient in itself to answer various clinical questions. For evaluation of a diagnostic test, a survey design that allows comparison with the gold standard is often used. For prognostic studies a prospective cohort design is useful. Therapeutic interventions are best evaluated using RCTs. Aetiological studies are often cohort or case-control studies; although the RCT is ideal it may not be always possible to conduct one. Epidemiological studies are often cross-sectional surveys.

Knottnerus JA and Muris JW (2003) Assessment of the accuracy of diagnostic tests: the cross-sectional study. *Journal of Clinical Epidemiology* **56**: 1118–1128.

33.D. The RCT has traditionally been considered as a study design that can yield results with a high degree of internal validity. But the major drawback of RCTs is that the process takes place under highly experimental conditions, which are not seen in clinical practice. So any results achieved from such RCTs, though valid, may not be reproducible in everyday practice. In order to circumvent this issue, more naturalistic trials that retain core principles of RCT such as randomization, longitudinal follow-up, and controlled intervention are being increasingly used. Such real-world RCTs are called pragmatic trials or effectiveness trials. Such trials can be useful to find out if an intervention will be effective in clinical practice, although they may not be suitable to study the biological efficacy of a drug. A pragmatic RCT may reject various practices seen in an explanatory RCT, such as strict exclusion criteria, blinding, placebo use, fixed dose intervention, high follow-up care, per-protocol analysis, etc. But basic principles such as randomization and use of probability theory (hypothesis testing and p values) are retained.

Hotopf M. The pragmatic randomised controlled trial. *Advances in Psychiatric Treatment* 2002; **8**: 326–333.

34.C. Bias is defined as any trend in the collection, analysis, interpretation, publication, or review of data that can lead to conclusions that are systematically different from the truth. It can also be termed as a systematic error that influences the result in either direction. Hence a biased study could either overestimate or underestimate the true effect, depending on the direction of the trend. Bias may be introduced by poor study design or poor data collection. Bias cannot be ‘controlled for’ at the analysis stage. In RCTs, randomization ensures a reduction in selection bias if the process is carried out in a strictly concealed manner. Blinding can reduce the measurement bias if properly executed.

Page LA and Henderson M. Appraising the evidence: what is measurement bias? *Evidence Based Mental Health* 2008; **11**: 36–37.

35.E. Recall bias refers to the systematic error produced by the tendency of subjects to recall an exposure differently when they are diseased compared with when they are not. Recall bias most often occurs in case-control studies. The remaining choices refer to genuine disadvantages of a well-conducted RCT.

Lawrie SM, McIntosh AM and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 47.

36.D. In most drug trials, patients drop-out because of non-efficacy or adverse events. If we think that a number of participants drop-out because of non-efficacy, dropping them out of the analysis would project a favourable outcome for the drug in question. Hence the LOCF method takes the last observation and utilizes it in the analysis. For illustration, we take two subjects, in a trial of antidepressants.

Antidepressant trial Montgomery–Asberg depression rating scale (MADRS)

	Subject 1	Subject 2
Baseline	30	30
Week 1	20	30
Week 2	10	30 (drop-out due to non efficacy)
Week 3	5	30
Final score	1	30

Subject 1, improves significantly over the 4 weeks, his MADRS score has dropped to 1 from a baseline of 30, while Subject 2 dropped out of the study in the second week, due to non-efficacy. If we remove subject 2 from the analysis, the mean score at the end would be 1 (an whopping improvement of 29 points on the MADRS), while if we carry forward his last observation score (week 2) of 30 to the end and took the mean of the two scores (15.05), the drop is only 15 points from the mean baseline score of 30.

Trials of Alzheimer's disease interventions are different, since we do not expect (although we most definitely would like to see) improvement in the cognitive score, but a rather slow decline in scores over time, in spite of the medications, due to the progressive nature of the illness.

If a patient drops out early because of the experience of adverse effects, carrying forward his score to the endpoint analysis will falsely project a favourable outcome. Again to illustrate, let us consider a trial of cholinesterase inhibitors.

	Chl trial MMSE	
	Subject 1	Subject 2
Baseline	20	20
Week 1	20	20 (drops out because of side effects)
Week 2	10	20
Week 3	5	20
Final score	1	20

Subject 1 experienced a decline of 19 points over 4 weeks, while the second subject dropped out the first week, when his MMSE had not declined. If we carry forward his last observation of 20, it will look like there was no deterioration at all, and the difference in the mean scores over time would be diluted to 10, rather than a drop of 19.

As a corollary, the reason for drop-out is another important issue. In trials of Alzheimer's disease interventions, early drop-outs are most probably due to adverse effects, while late drop-outs are due to non-efficacy. This can again project a favourable outcome for the drug.

Streiner DL. The case of the missing data: methods of dealing with dropouts and other research vagaries. Can J Psychiatry 2002; **47**:68–75.

37.E. There are a number of ways to manage heterogeneity. The easiest way would be to avoid it. This includes using strict inclusion criteria to include studies that are as similar as possible. In case of continuous variables, one of the ways would be to transform the data so that all data look similar and are less heterogeneous. Meta regression is a collection of statistical procedures to assess heterogeneity, in which the effect size of study is regressed on one or several covariates, with a value defined for each study. The fixed-effect model of meta-analysis as reported in this question, considers the variability between the studies as exclusively due to random variation. The random-effects model assumes a different underlying effect for each study and takes this into consideration as an additional source of variation. The effects of the studies are assumed to be randomly distributed and the central point of this distribution is the focus of the combined (pooled) effect estimate. If there were some types of studies that were likely to be quite different from the others, a subgroup analysis may be done. And finally, one could exclude the studies that contribute a great deal to the heterogeneity. Locating unpublished studies may help reduce publication bias but will not have any predictable and constant effect on the degree of heterogeneity.

Freeman N and Geddes J. Understanding and interpreting systematic reviews and meta-analyses. Part 2. Meta-analyses (editorial). *Evidence-Based Mental Health* 1998; **1**: 102–4.

Geddes J, Freeman N, Streiner D, et al. Understanding and interpreting systematic reviews and meta-analyses. Part 1. Rationale, search strategy, and describing results (editorial). *Evidence-Based Mental Health* 1998; **1**: 68–9.

38.C. Odds are the probability of an event occurring divided by the probability of the event not occurring. An odds ratio is the odds of the event in one group (e.g. intervention group) divided by the odds in another group (e.g. control group). Odds ratios tend to exaggerate the true relative risk to some degree. But this exaggeration is kept minimal and even negligible if the probability of the studied outcome is low (empirically, less than 10%); in such cases the odds ratio approximates the true relative risk. As the event becomes more common the odds ratio no longer remains a useful proxy for the relative risk. It is suggested that the use of odds ratios should probably be limited to case-control studies and logistic regression examining dichotomous variables. As risk refers to the probability of an event occurring at a time point, in other words it is the same as the incidence rate. The inherent cross-sectional nature of a case-control study (where 'existing cases' are recruited) does not allow one to study 'new' incidences. Hence we cannot measure risk, and so relative risk, from case-control designs.

Katz KA. The (relative) risks of using odds ratios. *Archives of Dermatology* 2006; **142**: 761–764.

39.E. Choice A refers to a clinical question related to therapeutic intervention – RCTs are best suited to answer this. Choice B is an epidemiological question – 'how many in a population have a particular condition?' A cross-sectional survey could answer this question. Choice C refers to a prognostic question – how long will it take for schizoaffective relapse following lithium discontinuation? A prospective cohort (or a RCT if ethically approved) is the most appropriate design for this question. Choice D requires a clinical audit, which is often closer to a cross-sectional survey in design. Choice E refers to defined cases and controls being compared for a possible exposure or risk factor that might have occurred in the past. Hence the case-control design is best suited to answer this question. Please note that it is possible to design a prospective cohort study by observing for a long time those with academic failure to detect development of depression.

Lawrie SM and McIntosh AM, Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 27.

40.B. N-of-1 trials are randomized double-blind multiple crossover comparisons of an active drug against placebo in a single patient. The design uses a series of pairs of treatment periods called modules. Within each module the patient receives active treatment during one period and either an accepted standard treatment or placebo in the other. Random allocation determines the order of the two treatment periods within each pair and both clinician and patient are blinded for the intervention. This design is mostly suited for chronic recurrent conditions for which long-term interventions exist that are not curative. Interventions with rapid onset and offset of effects are best suited for n-of-1 trials. This allows shorter treatment periods wherein multiple modules of intervention and placebo/standard treatment can be compared, increasing the chance of achieving a statistically significant result. It is also necessary that the interventions tested must be cleared from the patient's system within a finite washout period.

Price JD and Evans JG. An N-of-1 randomized controlled trial ('N-of-1 trial') of donepezil in the treatment of non-progressive amnestic syndrome. *Age and Ageing* 2002; **31**: 307–309.

41.E. Publication bias refers to the tendency of journals to accept and publish certain types of studies more often than the others. In general, studies with results that are impressively significant or of higher quality by virtue of larger sample size are more successful in getting published. Publication bias can be considered as a form of selection bias when one attempts a systematic review or meta-analysis. Publication bias can be detected using a funnel plot – visual inspection of a graph drawn by plotting a measure of precision (often sample size) against treatment effect will reveal asymmetry of the two arms of the funnel-shaped graph if publication bias is present. Galbraith plot refers to a graph obtained by plotting a measure of precision such as (1/standard error) against standard normal deviate (log of odds ratio/standard error). The coordinates obtained from such a plot can be used to determine the extent of publication bias using linear regression. Fail-safe N is another way of estimating publication bias. Consider a meta-analysis yielding a statistically significant difference in outcome between two interventions, despite suspected publication bias. Then fail-safe N answers the question 'How many missing studies are needed to reduce the effect to statistical non-significance?' The higher the fail-safe N, the lower the publication bias. If one could solicit and compare all unpublished data with published data, then publication bias would become obvious.

Lawrie SM, McIntosh AM, and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 146.

42.A. Allocation concealment refers to the process used to prevent fore knowledge of the assignment before allocation is complete. So the investigator who recruits subjects for a trial will not know the nature of assignment of consequent subjects that enter randomization. Allocation concealment seeks to prevent selection bias, protects the allocation sequence *before and until* assignment, and can almost always be successfully implemented in a RCT. It is often confused with blinding which seeks to prevent ascertainment bias and protects the sequence *after* allocation, and cannot always be implemented.

Schulz KF, Chalmers I., and Altman DG. The landscape and lexicon of blinding in randomized trials. *Annals of Internal Medicine* 2002; **136**: 254–259.

43.B. The standard deviation has the same units as the primary variable. This is an advantage of standard deviation compared with variance, which is also a measure of dispersion.

Lawrie SM, McIntosh AM, and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 60.

44.D. If many observations are substantially higher than the median we can assume that the mean of the distribution might be greater than the median. This translates to a positively skewed distribution. No comments can be made on mode using the available information.

Lawrie SM, McIntosh AM, and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 60.

45.C. α is the probability of type 1 error. It is used to set the threshold for statistical (not clinical) significance, often arbitrarily set as $p = 0.01\text{--}0.05$ ($\alpha = 1\text{--}5\%$). If $\alpha = 0.05$, there is a 1 in 20 or 5% chance that the null hypothesis is rejected wrongly.

Lawrie SM, McIntosh AM, and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 64.

46.C. Despite the increasing importance and abundance of systematic reviews and meta-analyses in the scientific literature, the reporting quality of systematic reviews varies widely. To address the issue of suboptimal reporting of meta-analyses, an international group in 1996 developed a guidance called the QUOROM Statement (**Q**Uality **O**f **R**eporting **O**f **M**eta-analyses). QUOROM focused on the standards of reporting meta-analyses of RCTs. A revision of these guidelines renamed as PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) includes several conceptual advances in the methodology of systematic reviews.

Moher D, Cook DJ, Eastwood S, et al. Improving the quality of reporting of meta-analysis of randomized controlled trials: The QUOROM statement. *Lancet* 1994; **354**: 1896–1900.

David Moher et al., 'Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement,' *PLoS Med* **6**: e1000097.

47.E. Meta-analysis is generally done to combine the results of different trials, as individual clinical trials are often too small and hence underpowered to detect treatment effects reliably. Meta-analysis increases the power of statistical analyses by pooling the results of all available trials. But this comes at a small cost. Although similar studies are taken to be included in the meta-analysis, it is likely that each trial is different from each other just by chance. Sometimes the difference can occur due to foreseeable situations, e.g. the dosage of medication tested, the mean ages of the population tested, difference in the scales used, etc, may differ among studies. To measure if this heterogeneity is more than the random heterogeneity we expect, statisticians resort to certain tests of heterogeneity. They are statistical as in the chi-square test (or Q statistic), which tests the 'null hypothesis' of homogeneity and the I-squared test (which measures the amount of variability due to heterogeneity). Galbraith's plot and l'Abbé plot are pictorial representations of heterogeneity. A paired t test is generally not used to calculate the heterogeneity.

Perera R, and Heneghan C. Interpreting meta-analysis in systematic reviews. *Evidence-Based Medicine* 2008; **13**: 67–69.

Lam RW. Using metaanalysis to evaluate evidence: practical tips and traps. *Canadian Journal of Psychiatry* **50**: 167–174.

48.A. Data can be qualitative or quantitative. Quantitative data refers to measures that often have a meaningful unit of expression. This can be either discrete or continuous. A discrete measure has no other observable value between two contiguous potentially observable values, i.e. there are 'gaps' between values. A continuous variable, on the other hand, can take potentially infinite values. The other choices in the question refer to qualitative measures whose value can only be described and counted but cannot be expressed in meaningful units.

Lawrie SM, McIntosh AM and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 56.

49.A. A major disadvantage with RCTs is the poor generalizability of experimental findings to a clinical setting. Having strict inclusion and exclusion criteria may help choose a highly homogeneous population, increasing the internal validity of the study but at the expense of generalizability.

Persaud, N. and Mamdani, M.M. External validity: the neglected dimension in evidence ranking. *Journal of Evaluation in Clinical Practice* 2006;12(4): 450– 453.

50.C. In scientific research, nothing can be proven; we can only disprove presumed facts. If one wants to prove maternal smoking causes school refusal, it is best to assume that maternal smoking does not cause school refusal to start with and then proceed to disprove this statement. Such statements waiting to be disproved during the course of a research study are called the null hypotheses. The converse of the null hypothesis is called the alternative hypothesis.

Research question: Does maternal smoking increase risk of school refusal?

Null hypothesis: Maternal smoking does not increase risk of school refusal

Alternative hypothesis: Maternal smoking increases the risk of school refusal.

Guyatt G and Rennie D, eds. *Users' Guides to the Medical Literature. A Manual for Evidence-based Clinical Practice*. AMA Press, 2002, p. 680.

51.D. Subjects do not get randomized in a simple cohort study. Hence there is no question of allocation concealment. When valid instruments and a reasonable follow-up schedule are used, identification of those who develop the 'event' of interest/outcome is often not difficult in a cohort design. Often the most difficult part is to identify a reasonable control cohort that lacks the 'exposure' of interest. Internal controls refer to those who are 'non-exposed' but derived from the same study population as the 'exposed'. External control refers to an independently recruited cohort without the exposure.

Lawrie SM, McIntosh AM, and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 29.

52.D. 95% confidence limits of means of a sample are nothing but the range between an observation less than approximately two standard error units less than mean value and an observation two standard error units more than the mean value. Using mathematical expression, 95% confidence limits = mean \pm (2 \times standard error of mean).

Standard error of mean is calculated as SE = standard deviation/ $\sqrt{\text{sample size}}$.

SE = $15/\sqrt{36} = 15/6 = 2.5$ in this question.

Hence 95% confidence limits are

$262 \pm (2 \times 2.5) = 262 \pm 5 = 257, 267$.

Bland, M. *An Introduction to Medical Statistics*, 3rd edn. Oxford University Press, 2000. P. 126.

53.B. An important property of the normal distribution curve is the relationship between the SD of normally distributed observations and probability. Normal distribution curves are symmetric and bell-shaped. Nearly 68.5% of the sampled population will lie within 1 SD of the mean on either side of the curve, 95.5% within 2 SDs, and 99% within 3 SDs. In other words, there is a 1% chance that an observation will fall outside +3 SD to -3 SD; a 5% chance that it will fall outside +2SD to -2SD and nearly 30% chance that it will occur outside +1SD and -1SD.

Johnstone EC, et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 189.

54.C. If the confidence interval includes a null treatment effect, the null hypothesis cannot be rejected within the set levels of confidence limits. Confidence intervals provide a measure of dispersion of the point estimate within stipulated confidence limits (arbitrarily 95% corresponds to a p value of 5%). In other words, confidence intervals provide the assured range within which the true value may lie. Confidence intervals are a measure of precision of the results obtained from a study. The larger the sample studied, the narrower the intervals. If the confidence intervals cross the value '0' for the difference between means then the results are statistically not significant. If it crosses the value '1' for ratio measures such as the odds ratio, it is not significant. If it crosses infinity for inverse ratios such as NNT then it is not significant.

Johnstone EC, et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 192.

55.A. In this study, the dependent variable is treated as a categorical outcome. In other words, the population has been categorized into 'akathisia present' or 'akathisia absent'. This type of outcome yields frequency counts or proportions that can be analysed for significance using the chi square test. The t test is used for comparing means. The Wilcoxon rank sum test is a non-parametric equivalent of the t test. Pearson coefficients are used to analyse correlation. Regression analyses are used to predict one variable from another when they are correlated.

Johnstone EC, et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 193.

56.D. Irrespective of the number of observations made, the shape of a normally distributed curve is symmetric and bell shaped. The exact shape of the normal distribution is defined by a function that has only two parameters: mean and standard deviation. For a given range of scores, when the standard deviation is small, the curve becomes leptokurtic, i.e. thin but still symmetric. When the standard deviation is larger, it becomes platykurtic.

Lawrie SM, McIntosh AM, and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 255.

57.C. Standard deviation is a widely used measure of dispersion of data in descriptive statistics. Other measures include range, interquartile range (usually accompanies median values), and variance. Standard deviation is obtained by the root mean square of differences between individual observations and the mean value. Note that standard error is often preferred as the measure of dispersion while making inferences from a sample of the population. Standard error is a measure of precision of sample estimate in comparison with the population value.

Johnstone EC, et al., eds. *Companion to Psychiatric Studies*, 7th edn. Churchill Livingstone, 2004, p. 190.

58.B. The iterative approach in qualitative studies refers to the process of altering the research methods and building the hypothesis as the study progresses, in response to new information gained while conducting the research. This flexibility allows qualitative studies to follow an inductive rather than the deductive approach seen in quantitative research. Data come before theory is generated in inductive methods; a stated theory is tested using generated data in deductive methods.

Greenhalgh T. How to read a paper: papers that go beyond numbers. *British Medical Journal* 1997; 315: 740–743.

59.E. In the above question, the mean is given as 120 mmHg. Assuming normal distribution with a standard deviation of 10 mmHg, we can find out the proportion of the population that will fall between two observed values. For values between -1 and $+1$ standard deviation from the mean, this will be nearly 68%. Nearly 34% will have values between the mean and 1 standard deviation. In other words 34% will have systolic blood pressure between 120 mmHg and 130 mmHg.

Lawrie SM, McIntosh AM, and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 60.

60.A. Significant numbers of subjects recruited for trials often do not complete the trial as per protocol. The data generated from such drop-outs cannot be ignored as this will potentially lead to an attrition bias in favour of the intervention generally. Therefore, it is a standard practice to analyse the results of trials on an 'intention to treat' basis, i.e. data from subjects are analysed as per initial allocation irrespective of trial completion. In a few situations such as the 'efficacy studies', intention to treat analysis is not used, instead 'per-protocol analysis' is carried out. An efficacy study is designed to explain the effects of the intervention itself. This is in contrast to effectiveness studies, which are designed to study the usefulness of making an intervention available (choices B, C and D).

Greenhalgh T. Assessing the methodological quality of published papers. *British Medical Journal* 1997;315:305–8.

61.D. Relative risk reduction (or relative benefit increase) is calculated using the following expression: relative risk reduction = absolute risk reduction/control event rate (RRR = ARR/CER)

The control event rate is 20%; the experimental event rate is 40%.

Absolute risk reduction is the difference between the two event rates, i.e. $40 - 20 = 20\%$

$$\text{ARR} = 20/20 = 1$$

Guyatt G and Rennie D, eds. *Users' Guides to the Medical Literature. A Manual for Evidence-based Clinical Practice*. AMA Press, 2002, p. 660.

62.B. The NNT can be calculated from the absolute risk reduction (ARR).

$$\text{NNT} = 1/\text{ARR}$$

$$\text{NNT} = 1/0.2 = 5$$

Five subjects must be treated with memantine to have one additional response.

Guyatt G and Rennie D, eds. *Users' Guides to the Medical Literature. A Manual for Evidence-based Clinical Practice*. AMA Press, 2002, p. 660.

63.A. To calculate the odds ratio, it will be useful to construct a 2×2 table. As per protocol analysis is used, only those who completed the trial have been included in the analysis.

	Response	No response	Total
Memantine	40 (a)	60 (b)	100
Placebo	20 (c)	80 (d)	100
Total			

The odds ratio is obtained using the cross product ratio ad/bc
 $= (80 \times 40)/(60 \times 20) = 8/3 = 2.7$

Guyatt G and Rennie D, eds. *Users' Guides to the Medical Literature. A Manual for Evidence-based Clinical Practice*. AMA Press, 2002, p. 660.

64.C. Spearman's correlation is used for non-parametric correlation analysis. It is also called the rank correlation test. It can be used when one or both variables to be correlated consist of ranks (ordinal) or if they exist as quantitative data but do not have normal distribution. Pearson's correlation is used for parametric correlation. Kappa is a measure of agreement not correlation. Cohen's d is used to calculate effect size. The internal consistency of an instrument is tested using Cronbach's alpha.

Lawrie SM, McIntosh AM, and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, pp. 72 and 75.

65.B. To enable use of inferential statistics, standard sampling assumptions such as (1) the randomness of the sampled data and (2) the independent nature of the observations must be met. In addition, when parametric statistics are employed assumptions such as

1. homogeneity of variance of the samples
2. observations are obtained from continuous (interval/ratio) scales
3. normal distribution of the observed variable

must be met. There is no set proportion of population size that must constitute the sample size in order to use parametric statistics. But in samples that are too small the distribution may not be normal and the central limit theorem may not be applicable. In conditions where such assumptions are not met non-parametric statistics are used. The latter are often considered to be less robust.

Bland, M. *An Introduction to Medical Statistics*, 3rd edn. Oxford University Press, 2000, p. 210.

66.A. Drawing a 2×2 table will help answering this question

	Death	No death	Total
Drug A	20		200
Placebo	25		225
Total			

Further information can be filled in as below:

	Death	No death	Total
Drug A	20	180	200
Placebo	25	200	225
Total	45	380	425

Control event rate is the rate of death ('event' of interest) in the control group = 25/225

Guyatt G and Rennie D, eds. *Users' Guides to the Medical Literature. A Manual for Evidence-based Clinical Practice*. AMA Press, 2002, p. 660.

67.C. Adequacy of blinding can be tested during or after completing a trial by asking the blinded parties to guess the allocation. Guess rates that are significantly higher than expected by chance indicate failure of blinding. Testing for 'blindness' may not generate valid answers all the time. This is because as participants begin to experience treatment response or outcomes of interest, they begin to generate 'hunches' about the efficacy of the treatments being tested. Hence tests for blinding can show spurious failure of blinding while in fact they test the 'efficacy hunches' that develop late in the process of a trial.

Sackett DL. Measuring the success of blinding in RCTs: don't, must, can't or needn't? *International Journal of Epidemiology* 2007; **36**: 664–665.

68.B. The central limit theorem explains why normal distributions are so frequent when considering most biological parameters. Consider repeated sampling from a population where distribution of the observed variable is unknown. You intend to plot the distribution of individual means of each sample from the population. As sample size increases, the sample means approach a normal distribution with its mean value being the same as the population mean and a standard deviation equal to the standard deviation of the population divided by the square root of the sample size. Usually 10 or more observations are sufficient to result in an approximate normal distribution.

Lawrie SM, McIntosh AM, and Rao S. *Critical Appraisal for Psychiatry*. Churchill Livingstone, 2000, p. 252.

69.C. The term validity refers to the strength of our conclusions, or in the case of statistics, the strength of our inferences. It refers to applicability. The term reliability refers to the consistency of our measurements, or the reproducibility. An important subtype of validity is called criterion validity. If an instrument provides a result that withstands the test of an external criterion then the instrument is said to have high criterion validity. The external criterion may be a measurement that can be obtained more or less at the same time (concurrent validity) or it may be an outcome that is predicted to occur in the future (predictive validity). If a test offers something over and above what is offered by an existing instrument, then incremental validity can be established. Internal consistency of a test refers to looking at how consistent the results are for different items (measuring the same construct) within the instrument studied. This can be measured by undertaking item-item correlation, item-total score correlation or split half reliability (Cronbach's alpha; see elsewhere in this chapter).

Fitzner K. Reliability and validity: a quick review. *Diabetes Educator* 2007; **33**: 775–780.

70.E. Questions similar to this are very common in the MRCPsych exam. Most of such questions provide some data and require the candidate to do a series of calculations from the data. It is always advisable to redraw as soon as possible the presented data in a format that will fit the purpose. From the given table we can create a 2×2 table, with the gold standard result on the top. One should be careful while constructing the 2×2 table. It is advisable to stick to one style of using columns and rows to indicate a particular group of data. Here, we have drawn the 2×2 table with the gold standard results indicated across the two data columns with screening test results indicated across the two rows.

		DSM-IV (gold standard)		Total
		Diagnosis present	Diagnosis absent	
Screening test	Positive	(A) 39	(B) 40	(A+B) 79
	Negative	(C) 4	(D) 84	(C+D) 88
	Total	(A+C) 43	(B+D) 124	167

Sensitivity is defined as the test's ability to identify people who, according to the *diagnostic (gold standard)*, actually have the disorder (true positives). Sensitivity = $A/(A + C) = 39/43 = 90.69\%$, i.e. 90.69% of subjects who really have depression according to DSM-IV criteria have a positive test result on the screening test. In other words, sensitivity is the proportion of true positives (cases) correctly identified by the test.

Streiner D and Geddes J. Some useful concepts and terms used in articles about diagnosis. *Evidence-Based Mental Health* 1998; **1**: 6–8.

71.A. Specificity is defined as the test's ability to exclude people who, according to the

diagnostic (gold) standard, do not actually have the disorder (true negatives). Specificity = D/(B + D) = 84/124 = 67.74%, i.e. 67.74% of the people who do not have depression will have a negative result on the two-question screen. Thus specificity is the proportion of true negatives among all non-diseased individuals. In other words, it is the ability of a test to rule out the disorder among people who do not have it.

Streiner D and Geddes J. Some useful concepts and terms used in articles about diagnosis. *Evidence-Based Mental Health* 1998; **1**: 6–8.

72.A. Not all of those people, who have been found to be ‘positive’ on the test, might *actually have* the disorder. Positive predictive value (PPV) gives the proportion of true positives among the test positives. It is calculated using the formula, $PPV = A/(A + B) = 39/79 = 49.36\%$, i.e. 49.36% of people diagnosed with depression using the screening test actually have the illness.

Streiner D and Geddes J. Some useful concepts and terms used in articles about diagnosis. *Evidence-Based Mental Health* 1998; **1**: 6–8.

73.E. Not all of the people who have been found to be ‘negative’ on the test might *actually be* disease free. Negative predictive value (NPV) answers the question ‘Of those people who have been found to be ‘disease negative’ on the test, how many *actually do not have* the disorder?’ It is calculated using the formula, $NPV = D/(C + D) = 84/88 = 95.45\%$, i.e. 95.45% of people diagnosed ‘normal’ on the test don’t have the disorder.

Streiner D and Geddes J. Some useful concepts and terms used in articles about diagnosis. *Evidence-Based Mental Health* 1998; **1**: 6–8.

74.D. The prevalence, also known as the pretest probability or base rate, refers to the proportion of people who have the disorder = (A + C)/N, i.e. $43/167 = 25.74\%$.

Streiner D and Geddes J. Some useful concepts and terms used in articles about diagnosis. *Evidence-Based Mental Health* 1998; **1**: 6–8.

75.A. PPV and NPV depend on the prevalence of the illness, and, as one can see, the prevalence of an illness can vary according to the population it tests. For example, the prevalence of depression is likely to be more in patients in a palliative care unit. Since the prevalence keeps changing with population, and hence the PPV and NPV, one way of summarizing the findings of a study of a diagnostic test where there is a different prevalence is to use the *likelihood ratio*. The *likelihood ratio for a positive test (LR+)* result is the likelihood that a positive test comes from a person with the disorder rather than one without the disorder. LR+ is calculated using the formula, $LR+\text{ve} = [A/(A + C)]/[B/(B + D)]$

or simply

$LR+\text{ve} = \text{sensitivity}/(1 - \text{specificity})$.

So, $(39/43)/(40/124) = 0.90/0.322 = 2.8$. Since the specificity and sensitivity of a test are considered to be constant for any particular test, the LR is also constant irrespective of prevalence rates.

Streiner D and Geddes J. Some useful concepts and terms used in articles about diagnosis. *Evidence-Based Mental Health* 1998; **1**: 6–8.

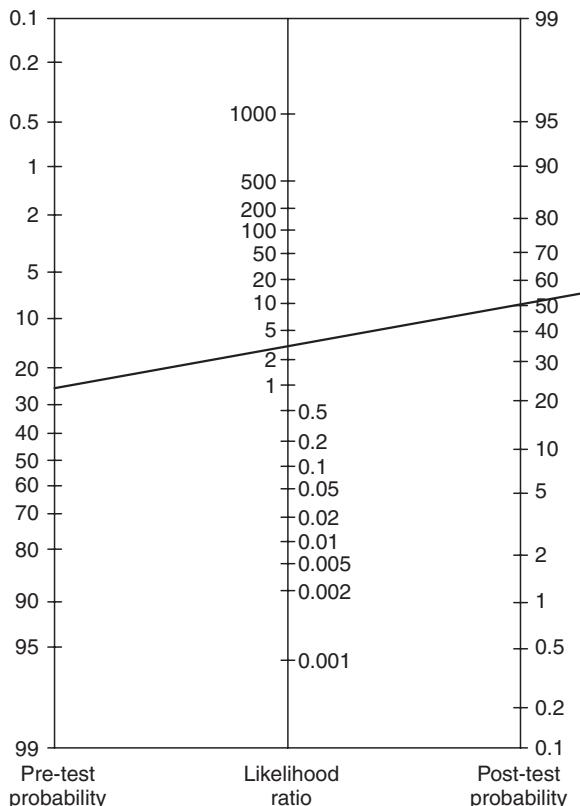
76.A. The LR₋ represents the likelihood that a negative test comes from a person with the disorder rather than one without the disorder. LR₋ is calculated using the formula $LR_{-ve} = [C/(A + C)]/[D/(B + D)]$, or simply $LR_{-ve} = (1 - \text{sensitivity})/\text{specificity}$.

$$\text{So, } (4/43)/(84/124) = 0.10/0.67 = 0.14$$

Similar to LR₊, LR₋ is also constant irrespective of prevalence rates.

Streiner D and Geddes J. Some useful concepts and terms used in articles about diagnosis. *Evidence-Based Mental Health* 1998; **1**: 6–8.

77.E. The post-test probability is the probability that a patient, scoring positive on the test, actually has the disorder (PPV). It can be calculated using the nomogram that is provided. Since we know the pre-test probability (prevalence) and the likelihood ratio, we should be able to find the post-test probability from the chart. A straight line drawn through the pre-test probability (25) and the likelihood ratio +ve (2.8) should yield a post-test probability of about 50.

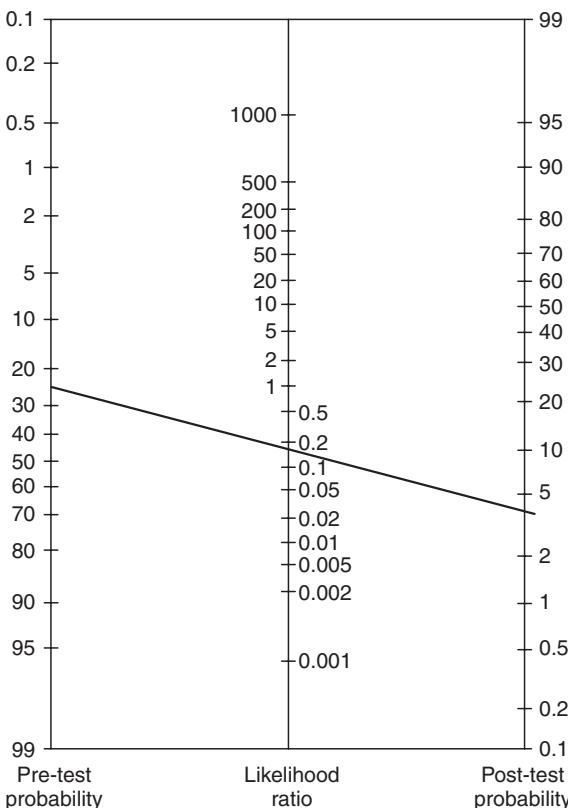


Streiner D and Geddes J. Some useful concepts and terms used in articles about diagnosis.

Evidence-Based Mental Health 1998; **1**: 6–8.

Fagan TJ. *New England Journal of Medicine* 1975; **293**: 257.

78.B. In this case, since the question is about post-test probability of a negative test, the likelihood ratio -ve (0.14) and the line would pass through 4.



Streiner D and Geddes J. Some useful concepts and terms used in articles about diagnosis. *Evidence-Based Mental Health* 1998; **1**: 6–8.

79.A. False positive (FP) is the number of people diagnosed to have a condition with the new test when they actually do not have the condition according to the gold standard. In this case, the percentage of people falsely identified by the test as depressed. Using the 2×2 table, false positive is calculated $FP = B/B+D = 40/124 = 32\%$.

Streiner D and Geddes J. Some useful concepts and terms used in articles about diagnosis. *Evidence-Based Mental Health* 1998; **1**: 6–8.

80.B. False negative (FN) is the number of people not diagnosed with a condition with the new test when they actually have the condition according to the gold standard. In this case, the percentage of people among the depressed group falsely identified by the test as not depressed, i.e. $C/A + C; 4/43 = 9.3\%$.

Streiner D and Geddes J. Some useful concepts and terms used in articles about diagnosis. *Evidence-Based Mental Health* 1998; **1**: 6–8.

81.D. In Question 75, we discussed how the prevalence of a condition can vary according to the population tested. Using the same screening test for depression in the general population of 1000 subjects (N), we are asked to calculate the positive predictive value. The prevalence rate or pre-test probability is 10% ($A + C/N$). We need to make a fresh 2×2 table in order to answer the question. We know that sensitivity and specificity remains constant for the disease. From the given data the prevalence = $A+C/N = 10\%$

As $N = 1000$ now, we can say $A+C = 100$

Sensitivity ($A/A+C$) = $A/100 = 0.91$; so, $A = 91$.

Specificity ($D/B+D$) = 67.74% ; $D/900 = 0.677$; $D = 610$.

		DSM-IV (gold standard)		Total
		Diagnosis present		
Screening Test	Positive	(A) 91	(B) 290	(A+B) 381
	Negative	(C) 9	(D) 610	(C+D) 619
	Total	(A+C) 100	(B+D) 900	1000

Using the formula for positive predictive value, $PPV = A/A+B = 91/290 = 31\%$.

Streiner D and Geddes J. Some useful concepts and terms used in articles about diagnosis. *Evidence-Based Mental Health* 1998; **1**: 6–8.

82.E. See the table in Answer 81. Using the formula for negative predictive value, $NPV = D/C+D = 98.36\%$. Note that the same answer can be derived using pretest odds and likelihood ratios. Please see question 6.

Streiner D and Geddes J. Some useful concepts and terms used in articles about diagnosis. *Evidence-Based Mental Health* 1998; **1**:6–8.

83.A. This question pertains to the risk of the development of dyspepsia in the trial. As mentioned earlier, a 2×2 table with the exposure (drug/placebo) to the left and the outcome (dyspepsia) on top can be drawn to make calculations easier.

Dyspepsia		Total
Yes (n)	No (n)	
Drug	6 (A)	38 (B)
Placebo	2 (C)	37 (D)
Total	8 (A + C)	75(B + D)
		83

This question looks at the chances of developing dyspepsia with sertraline. It is otherwise called the ‘experimental event rate’ (EER). This is calculated as $A/(A + B)$; that is, $6/44 = 0.136$ or 13.6% . Similar to the above question, the chances of developing dyspepsia with placebo, or the ‘control event rate’ (CER) is $C/(C + D)$, or $2/39 = 0.05$ or 5% .

Andrade C. Understanding risk. *Synergy Times* 2001; **1**: 74.

Streiner DL. Risky business: making sense of estimates of risk. *Research Methods in Psychiatry*. *Canadian Journal of Psychiatry* 1998; **43**: 411–415.

84.C. This is otherwise called the ‘attributable risk’ or the ‘risk difference’ or ‘absolute risk reduction’ (ARR). It is calculated as the difference in the absolute risks of developing a headache between sertraline and placebo, that is $13.6 - 5 = 8.6\%$

Streiner DL. Risky business: making sense of estimates of risk. Research methods in psychiatry. *Canadian Journal of Psychiatry* 1998; **43**: 411–415.

85.B. This question asks for the ‘relative risk’ or ‘risk ratio’ of dyspepsia with sertraline. It is an estimate of how much greater is the risk of developing dyspepsia with sertraline than with placebo. It is the ratio of the absolute risks or ratio of event rates, i.e. $EER/CER = 13.6/5 = 2.7$. This means that the risk of dyspepsia with sertraline is 2.7 times that of placebo. If there is no difference between sertraline and placebo, the relative risk would be 1. Expressed otherwise, relative risk values that are more than 1.0 represent increases in risk. Relative risk values that are less than 1.0 represent decreases in risk. If 95% confidence intervals are given, and if the range includes the value 1, then the elevation in risk can be considered as statistically insignificant. The relative risk is used as a primary summary measure in RCTs and cohort studies.

Streiner DL. Risky business: making sense of estimates of risk. Research methods in psychiatry. *Canadian Journal of Psychiatry* 1998; **43**: 411–415.

86.B. This question looks at the odds ratio. It is an estimate of how many times more likely it was that a person who experienced a problem (dyspepsia) was exposed to the supposed cause (risk factor) than was a control subject (those not exposed to the risk factor). Let us consider the data in the table in a different way: the number of people who developed dyspepsia is 8 and those who did not develop dyspepsia is 75. The ‘odds’ of an event happening is the ratio of the probability of its occurrence to the probability of its non-occurrence. So in patients with dyspepsia, the probability of being on sertraline is $A/A + C = 6/8 = 0.75$. The probability of being on a placebo is $C/A + C = 2/8 = 0.25$. Therefore the odds of a person with nausea being on sertraline is $0.75/0.25 = 3$ or simply A/C . Similarly, we can also calculate the odds of the person ‘without dyspepsia’ being on sertraline. It is $38/37$ (B/D) = 1.02, i.e. the odds of having used sertraline in those who did not have nausea is 1.02. The ratio of these odds is simply called the odds ratio. The ratio = $(A/C)/(B/D)$ or (AD/BC) . That is, $3/1.02$ or $6 \times 37/2 \times 38 = 222/76 = 2.92$. The odds ratio is interpreted in a manner more or less similar to the relative risk. Confidence intervals are provided and interpreted in the same manner. Odds ratios are usually used in case control studies and in meta-analyses as primary summary measures.

Streiner DL. Risky business: making sense of estimates of risk. Research methods in psychiatry. *Canadian Journal of Psychiatry* 1998; **43**: 411–415.

87.A. As cost-effectiveness analysis has been applied to healthcare, researchers have used predominantly two methods of calculating the summary measure – the average ACER and incremental cost-effectiveness ratio (ICER). The ACER captures the average cost per effect, i.e. cost of treatment/effect of treatment. In this case, the cost of the new psychotherapy is £10,000 and the effect is 50 depression-free weeks. In the above question, the ACER for the new treatment (psychotherapy) will be $C/E = 10,000/50 = £200$. The ACER for antidepressants from the question will be $5000/45 = £111$.

Hoch JS and Dews CS. A clinician's guide to correct cost-effectiveness analysis: think incremental not average. *Canadian Journal of Psychiatry* 2008; **53**: 267–274.

Hoch JS and Dews CS. An introduction to economic evaluation: what's in a name? *Canadian Journal of Psychiatry* 2005; **50**: 159–166.

88.A. In contrast to ACER, the ICER reports the ratio of the change in cost to the change in effect (for example $\Delta C/\Delta E$). In plain and simple language, this pretty much translates to the extra cost per extra effect, i.e. $\Delta C/\Delta E$. From the question, we can see $\Delta C = 10,000 - 5000 = 5000$; $\Delta E = 50 - 45 = 5$ weeks. So, $\Delta C/\Delta E = 5000/5 = £1000$. Again in plain language, this would mean that compared with antidepressants, the new treatment would cost an average of 1000 additional pounds per one added depression-free week. In many economic evaluations, the ICER indicates that a new treatment is relatively more costly ($\Delta C > 0$) and relatively more effective ($\Delta E > 0$) than usual care, as in the situation in the question. Now, it is for the decision makers to decide if this additional money is worth spending.

Hoch JS and Dews CS. A clinician's guide to correct cost-effectiveness analysis: think incremental not average. *Canadian Journal of Psychiatry* 2008; **53**: 267–274.

Hoch JS, and Dews CS. An introduction to economic evaluation: what's in a name? *Canadian Journal of Psychiatry* 2005; **50**: 159–166.

89.C. An INB calculation determines whether the net benefit of a new treatment outdoes that of usual care. In our case, the net benefit of psychotherapy surpasses the benefit of using antidepressants. In general, the INB is calculated by valuing ΔE in pounds and then subtracting the associated ΔC . This is where the society's willingness to pay for the additional depression week comes into play. INB is calculated using the formula $(\Delta E \times \lambda) - \Delta C$, where λ is society's willingness to pay for a 1-unit gain of effect. In our question, $\Delta E = 5$ weeks; the service managers are willing to pay around £1500/each depression free week (λ – willingness to pay) and ΔC is £5000. So, $INB = (5 \times 1500) - 5000 = 7500 - 5000 = £2500$. The INB equation computes the net value of patient outcome gained in pounds. When the INB is positive, the value of a new treatment's extra benefits ($\Delta E \times \lambda$) outweighs its extra costs (ΔC). In short, society values the extra effect more than the extra cost (i.e. $\Delta E \times \lambda > \Delta C$). Conversely, when the INB is less than 0, society (or your health service management) does not consider the extra benefit worth the extra cost.

Hoch JS and Dews CS. A clinician's guide to correct cost-effectiveness analysis: think incremental not average. *Canadian Journal of Psychiatry* 2008; **53**: 267–74.

Hoch JS and Dews CS. An introduction to economic evaluation: what's in a name? *Canadian Journal of Psychiatry* 2005; **50**: 159–166.

90.C. Resources are scarce and are relative to needs. The use of resources in one way prevents their use in other ways. For example, if a city council decides to build a hospital on a piece of huge vacant land in the middle of the city, the city forgoes the opportunity to benefit from the next best alternative such as selling the land to decrease the current debt or building a shopping mall that would generate additional income for the council. Opportunity cost is assessed in not just monetary or material terms, but in terms of anything which is of value. The opportunity cost of investing in a healthcare intervention is best measured by the health benefits that could have been achieved had the money been spent on the next best alternative intervention. In this example the cost of not providing the 'next best alternative', antidepressant therapy, is the opportunity cost of providing psychotherapy as the first choice treatment.

Palmer S and Rafferty J. Economic notes: opportunity cost. *British Medical Journal* 1999; **318**: 1551–1552.

91.A. How does a decision maker decide on the willingness to pay (λ)?

The net benefit approach forces decision makers to directly consider the issue of valuing additional patient outcomes. The INB can be computed with various λ 's and analysed using multiple regression techniques. How sensitive the results are to the assumed λ value can be gauged using a cost effectiveness acceptability curve (CEAC). The CEAC shows the probability that a new treatment is cost-effective for different values for λ . So in the given question, if λ is £150, the probability of it being cost-effective is >90%. But if the λ is £10, the probability is less than 25%. At the same time, the probability of cost-effectiveness is also >90% if λ was £100. So, it would be sensible for the decision maker to pay £100 for every depression-free day, rather than a £150.

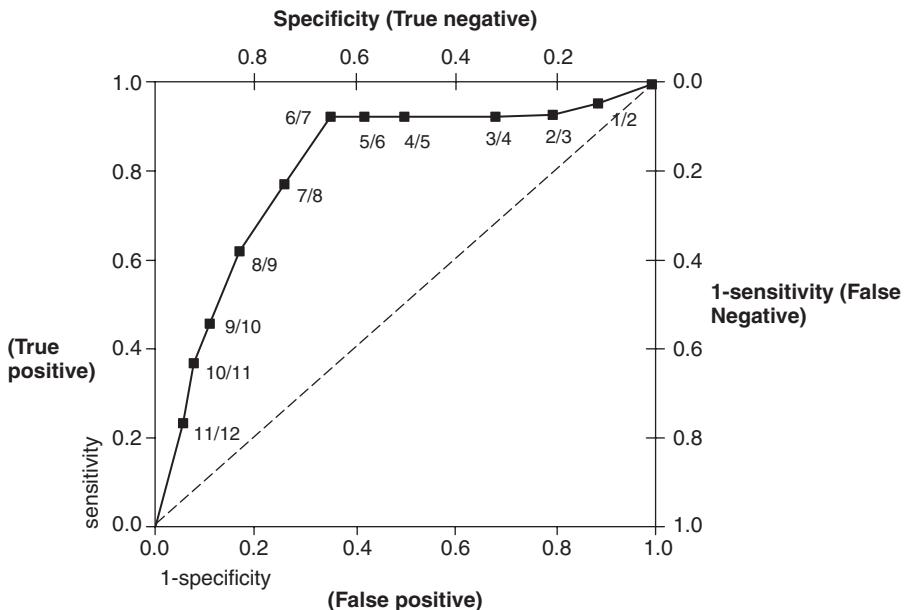
Hoch JS and Dewa CS. A clinician's guide to correct cost-effectiveness analysis: think incremental not average. *Canadian Journal of Psychiatry* 2008; **53**: 267–74.

Hoch JS and Dewa CS. An introduction to economic evaluation: what's in a name? *Canadian Journal of Psychiatry* 2005; **50**: 159–166.

92.C. This is a receiver operator curve (ROC). Scores on scales are usually considered to be continuous variables. Although dichotomizing continuous data leads to loss of information, in clinical practice, it makes sense to deal with dichotomous variables. For instance, with the new scale in the question, it would make sense if we can differentiate a depressed patient from a non-depressed patient, rather than just saying patient A had a greater score than patient B. In this situation, we should know where the ideal cut-off for the scale is. However, because the distributions of the scores in these two groups most often overlap, any cut-off point that is chosen will result in two types of errors: false negatives (that is, depressed cases judged to be normal) and false positives (that is, normal cases judged to be depressed). Changing the cut-off point will change the numbers of wrong judgements but will not eliminate the problem. The cut-off point also depends on if we want the test to be more sensitive (as in a screening test) or more specific (as in diagnostic tests). The ROC helps us to determine the ability of a test to discriminate between groups and to choose the optimal cut-off point.

Streiner DL and Cairney J. What's under the ROC? An introduction to receiver operating characteristics curves. *Canadian Journal of Psychiatry* 2007; **52**: 121–128.

93.A. The test in question is a 12-item scale that has a potential score ranging from 1 to 12. The sensitivity and specificity of each cut-off score (in this case, there will be 11 possible cut-off scores, as shown in the figure) is calculated with reference to the gold standard used to diagnose depression (in this case, DSM-IV). These pairs of values are plotted, with $(1 - \text{specificity})$ on the x-axis and the sensitivity on the y-axis, yielding the curve in the figure in question. Note that the true positive rate is synonymous with the term sensitivity, the true negative rate is the same as specificity, and the false positive rate means the same as $(1 - \text{specificity})$; they're simply alternative terms for the same parameters. For simplicity, the graph can be depicted as below



Streiner DL and Cairney J. What's under the ROC? An introduction to receiver operating characteristics curves. *Canadian Journal of Psychiatry* 2007; **52**: 121–8.

94.C. The dotted line represents a test that is useless in discriminating a depressed from a non-depressed person. A perfect test would run straight up the y-axis until the top and then run horizontally to the right. The more the ROC deviates from the dotted line and tends towards the upper left-hand corner, the better the sensitivity and specificity of the test.

Streiner DL and Cairney J. What's under the ROC? An introduction to receiver operating characteristics curves. *Canadian Journal of Psychiatry* 2007; **52**: 121–128.

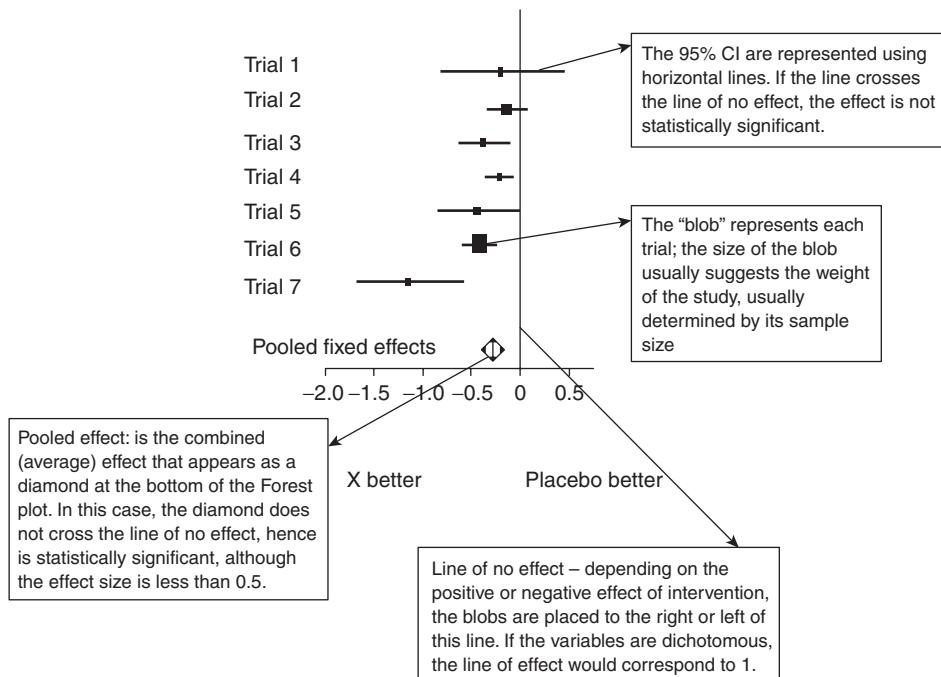
95.E. From the graph, we can see that the more the ROC curve deviates from the dotted line and tends toward the upper left-hand corner, the better the sensitivity and specificity of the test. Hence it is generally considered that the cut-off point that's closest to this corner is the one that minimizes the overall number of errors ('the best trade off'); in this case, it is 6/7. Since the scale in our question is a screening test for depression, we would want it to be more sensitive rather than specific. As we can see from the figure, a cut-off score of 11/12 would give excellent specificity, but very poor sensitivity, thus increasing the false negative rates.

Streiner DL and Cairney J. What's under the ROC? An introduction to receiver operating characteristics curves. *Canadian Journal of Psychiatry* 2007; **52**: 121–128.

96.C. The primary statistical measure obtained from the ROC is the AUC. The AUC value can be used to compare with the AUC value of a curve corresponding to the null hypothesis. The null hypothesis is represented by a curve that could be obtained if the test has no usefulness in discriminating those with the diagnosis and those without. This hypothetical curve will then have an AUC of 0.50, which corresponds to the area in the graph that falls below the dotted line. The difference in the two AUC consists of the area of the graph between the dotted line and the curve. The AUC can be interpreted in another very useful way. AUC is the probability that the test will show a higher value for a randomly chosen individual with depression than for a randomly chosen individual without depression. That means, if we find the AUC for this particular test was 0.9 and take two individuals at random, one with and one without depression, the probability that the first individual will have a higher score than the second is nearly 90%. Fortunately, the AUC, the sensitivities and specificities, and the whole ROC are calculated by statistical software, sparing us of the burden.

Streiner DL and Cairney J. What's under the ROC? An introduction to receiver operating characteristics curves. *Canadian Journal of Psychiatry* 2007; **52**: 121–128.

97.E. Meta-analyses are usually displayed in graphical form using Forest plots, which present the findings for all studies plus (usually) the combined results. This allows the reader to visualize how much uncertainty there is around the results. The graph in question, modified below, presents a Forest plot, sometimes called a 'blobbogram' identifying its basic components.



Geddes J, Freemantle N, Streiner D, et al. Understanding and interpreting systematic reviews and meta-analyses. Part 1: rationale, search strategy, and describing results (editorial). *Evidence-Based Mental Health* 1998; **1**: 68–69.

98.C. As shown in the diagram above, the horizontal lines along with the 'blobs' show the 95% confidence intervals of the effect size or each study. If the confidence intervals cross the line of no effect (at 0 in this case), it suggests that the effect is not statistically significant. Out of the seven studies, the confidence intervals of three of the effect sizes of three of the trials (1, 2 and 5) cross the line of no effect, and four (trials 3, 4, 6 and 7) do not cross the line. The summary measures in cases of dichotomous variables are usually odds ratios, and the line of no effect in that case will correspond to 1.

Perera R and Heneghan C. Interpreting meta-analysis in systematic reviews. *Evidence-Based Medicine* 2008; **13**: 67–69.

99.D. The size of the blobs (lozenges) in the blobbogram usually represents the size of the study, or more exactly the proportion of the weight that the study contributes to the combined effect. In this case, the largest blob is that of trial 6.

Geddes J, Freemantle N, Streiner D, et al. Understanding and interpreting systematic reviews and meta-analyses. Part 1: rationale, search strategy, and describing results (editorial). *Evidence-Based Mental Health* 1998; **1**: 68–69.

100.D. A systematic exploration of the uncertainty in the data is known as sensitivity analysis. It is carried out to measure the effects of varying study variables such as individual sample size, number of positive trials, number of negative trials, etc., on expected summary outcome measure of a study (often a meta-analysis or economic study). Sensitivity analysis can be undertaken to answer the question, 'Is the conclusion generated by a meta-analysis affected by the uncertainties in the methods used?' One such uncertainty is publication bias. So, we can use sensitivity analyses to find out the impact of having missed unpublished studies.

Egger M, Davey Smith G, and Phillips A. Meta-analysis: principles and procedures. *British Medical Journal* 1997; **315**: 1533–1537.

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INDEX

BEST OF FIVE MCQS FOR MRCPSYCH PAPER 3

Key: ■ denotes question, ■■ denotes answer

- 1 – specificity 205, 234
2 × 2 tables 226, 230
- Abbreviated Injury Scale 29
abbreviated mental test 92
abdominal pain, in children 79
absolute benefit increase (ABI) 210, 211, 215
absolute risk reduction (ARR) 231
 calculation of number needed to treat from 224
acamprosate 109, 122
accuracy of a test 186, 213, 214
acting out 166
activities of daily living (ADLs)
 Bristol scale 92
 cognitive impairment 93
 elderly people 81, 91
Activities of Daily Living-Prevention Instrument (ADL-PI) 91
adolescent psychiatry see child and adolescent psychiatry
Advances in Psychiatric Treatment 4
adverse life events, and depression 13, 26
aetiological studies 217
affective disorders, homicide offenders 49
after the exam 6
ageing process 81, 91
aggression, risk in absence of serious mental illness 38, 49
agomelatine 183, 209
agoraphobia 100
Ainsworth's Strange Situations procedure 65, 76
akathisia 195, 223
alcohol
 pharmacokinetics 108, 120
 units 108, 119
alcohol abuse/dependence/alcoholism
 acamprosate 109, 122
 blackouts 108, 120
 brief interventions 108, 119
 cocaine use 125
 covert sensitization 172
 depression 109, 122
 diazepam withdrawal 109, 121
 disulfiram 109, 111, 122, 124
 dopamine receptors and relapse susceptibility 123
 elderly people 90, 103, 110, 124
 foetal alcohol syndrome 59, 70, 108, 121
 FRAMES acronym 163, 179
 homicide offenders 49, 50
 inheritance 111, 125
 Jellinek's classification 105, 115
 learned tolerance 110, 123
 lifetime prevalence rates 107, 118
 naltrexone study 188, 215
 psychosocial interventions 107, 119
 screening 108, 120
 seizures 106, 116
 sertraline trial 202–3, 231–2
 shoplifters 54
 suicide risk 107, 118, 122, 154
 Wernicke's encephalopathy 106–7, 117–18
alcohol dependence syndrome
 criteria 105, 115
 genetic protection from 109, 121
 Prochaska's stages of change model 111, 124
Alcohol Use Disorders Identification Test (AUDIT) 120
alcohol withdrawal delirium
 contraindications 106, 117
 EEG 149
 mortality rate 105, 116
 thiamine replacement therapy 107, 118
 time to appearance 106, 116
alcohol withdrawal syndrome 106, 116
alcoholic hallucinosis
 features 112, 126
 risk factors 110, 123
Alcoholics Anonymous (AA) 119
allocation concealment 220
alpha (α) 193, 221
alprostadil 28
alternative hypothesis 222
altruism 166, 177
Alzheimer's disease (AD)
 Bråk's staging system 87, 99
 cholinesterase inhibitors 104
 conversion from mild cognitive impairment 147
 and Down's syndrome 69
 early-onset 83, 93, 104
 inheritance 87, 99
 interventions, trials of 208
 late-onset psychosis 85, 96
 memantine trial 196–7
 MMSE scores, average annual decline 82, 93
 psychosis 97
 stages 136, 148
 survival, median 86, 98
 and vascular dementia, differentiation between 81, 91

- Alzheimer's disease assessment scale – cognitive section (ADAS-Cog) 92, 93
- amiloride 24
- amitriptyline 30
- amnesia, following carbon monoxide poisoning 192
- amphetamine use 126, 129
- amylase levels in eating disorder 32
- amyloid plaques in CJD 87, 99
- anatomical dolls 42, 55
- annual review of competency progression (ARCP) 1
- anorexia nervosa
- babies of mothers with 139, 153
 - diagnosis 21
 - family therapy 75
 - laboratory findings 32
- anthropophobia 33
- anticholinergic delirium 137, 149
- anticholinesterase agents 88, 101
- anticipation 166
- antidepressants
- elderly people, poor response 84, 95
 - fatal overdose 16, 31
 - last observation carried forward method 208
 - observations of number of days to remission 192
 - see also specific antidepressants and classes of antidepressant
- antimotivational syndrome 114, 129
- antisocial personality disorder
- childhood conduct disorder 41, 53, 78
 - childhood maltreatment 38, 49
 - cocaine use 125
 - prisoners 48
 - and psychopathy, relationship between 37, 48
 - shoplifters 54
- anxiety
- alcohol abuse 122
 - CBT 164, 181
 - corticosteroid-induced 146
 - Cushing's disease 23
 - diazepam 82, 92
 - elderly people 82, 92, 100
 - hyperthyroidism 146
 - hypothyroidism 146
 - peptic ulcers 144
 - rating scale 183, 209
 - suicide risk 154
 - see also specific disorders
- anxiety hierarchy, systematic desensitization 173
- aphorisms, dialectical behaviour therapy 177
- apomorphine 28
- apoptosis 91
- application forms for exams 6
- applied tension 179
- Appraisal of Life Events Scale 29
- arbitrary inference 170
- Arctic hysteria 33
- area under the curve (AUC) 206, 235
- ariPIPrazole 151
- arithmetic mean 187, 193, 214, 221
- ascertainment bias 216, 220
- asceticism 166
- Asian flush 121
- Asperger's syndrome 67, 79
- assertive community treatment (ACT) 43, 56
- atenolol 149
- atropine 30
- attachment insecurity 23
- attachment patterns
- Ainsworth's Strange Situations procedure 65, 76
 - predictive of conduct disorder 64, 76
- attachment theory 165
- attention deficit hyperactivity disorder (ADHD)
- heritability 66, 78
 - maternal smoking during pregnancy 129
- attentional biases 181
- attributable risk 231
- attrition bias 224
- AUDIT (Alcohol Use Disorders Identification Test) 120
- auditory hallucinations 96, 126
- autism
- and Asperger's syndrome, comparison between 67, 79
 - biological findings 67, 79
 - and Down's syndrome 69
 - functional outcome predictors 60, 70
 - improvement by age 6: 65, 77
 - prevalence 63, 74
 - sibling risk rate 65, 77
- autistic savants 70
- autoerotic asphyxiation 53
- automatic thoughts 158, 170, 171
- Automatic Thoughts Questionnaire 171
- automatisms
- epilepsy 40, 52
 - non-insane versus insane 29, 51
- average cost-effectiveness ratio (ACER) 203, 232
- aversion therapy 124, 172
- baby blues 140, 154
- baclofen 150
- Banks v Goodfellow 100
- Barthel index 91
- Beck Depression Inventory 154
- behavioural management therapy 96
- behavioural tolerance 123
- benzodiazepines
- akathisia 195, 223
 - alcohol withdrawal delirium 117
 - alcohol withdrawal seizures 116
 - intoxication 149
 - withdrawal 109, 112, 121, 125
- bereavement
- and depression, distinction between 10, 22
 - interpersonal psychotherapy 175
 - see also grief
- Berne, Eric 170
- best of five (BOF) format 1
- beta interferons 150
- bias 190, 217
- meta-analysis 219
 - see also specific types of bias
- bicarbonate levels in eating disorder 32
- Binswanger's disease 87, 99, 136, 148
- biofeedback 164, 181

- bipolar disorder 10, 22
alcohol abuse 118
carbamazepine 12, 25
lithium 12, 25
longitudinal course 11, 23
sexual offenders 50
sleep changes in 27
sodium valproate 12, 25
black and white thinking 181
blackouts, alcoholic 108, 120
blinding 189, 216
and allocation concealment, distinction between 220
assessment 225
bias reduction 217
n-of-1 trials 220
blindness, sudden-onset 18, 33
blobbograms 236
block randomization 211
blocking 166
blood-injury-injection phobia 163, 179
blood pressure 196, 224
body dysmorphic disorder (BDD) 17, 32
body mass index (BMI) 133, 144
Bolam test 46
Bonnet, Charles 102
books 2, 3–4, 6–7
borderline personality disorder
dialectical behaviour therapy 163, 177, 180
partial hospitalisation 57
prisoners 48
borderline personality organization (BPO) 156, 168
Braak's staging system 87, 99
brain cancer, metastatic 137, 150
brain fog syndrome 33
breakdown of questions 2
breast cancer 150
brief interventions, alcohol abuse 108, 119, 179
brief psychodynamic psychotherapy 157, 169
bright-light therapy 21
Bristol scale 92
British ability scales 75
bruxism 181
bulimia nervosa
babies of mothers with 153
factorial study 189
laboratory findings 17, 32
psychotherapy 160, 175
bullying, childhood
adult psychopathology 60, 71
prevalence 64, 76
buprenorphine
half-life 128
opioid withdrawal 126
Burden Interview 93

CADASIL 147
caffeine 34
CAGE questionnaire 120
elderly people 103
Canadian Journal of Psychiatry 4
cannabis use 129

carbamazepine
bipolar disorder 12, 25
clozapine levels 34
and lithium 24
restless legs syndrome 28
side-effects 12, 25
teratogenicity 152
carbon monoxide poisoning 192
Caregiver Burden Scale 93
carers
of dementia patients 93
elder abuse 103
case-control studies
applications 191, 217, 219
odds ratios 232
recall bias 217
relative risk unable to measured in 219
catatonia
in depression 21
lorazepam challenge test 31
malignant 16, 31
in schizophrenia 9, 21
catharsis, group psychotherapy 177
Center for Epidemiological Studies Depression Scale 154
central limit theorem 226
chaining 173
change, stages of 111, 124
Charles Bonnet syndrome 89, 102
cheese reaction 16, 30
chest pain, in children 79
child abuse
claim to be committing abuse 156, 167
sexual abuse 55
Child and Adolescent Psychiatry 3
child and adolescent psychiatry
answers 69–80
books 3–4, 7
conduct disorder and adulthood antisocial personality disorder 41, 53
family therapy 178
foetal alcohol syndrome 108, 121
maternal smoking during pregnancy 129
PANDAS symptoms 137, 150
questions 59–68
school refusal 194, 222
Child Psychiatry 3
childhood maltreatment, and antisocial behaviour in later life 38, 49
chi-square test
applications 223
degrees of freedom 190, 217
meta-analysis heterogeneity 221
chlorpromazine 117
cholinesterase inhibitors 90, 103, 104
chronic fatigue syndrome (CFS) 138, 152
children 79
cigarette smoking
clozapine levels 34
maternal
and children's school refusal 194, 222
during pregnancy 49, 114, 129
shoplifters 54

- cimetidine 149
 ciprofloxacin 34
 circular questioning 178
 citalopram 142
 clinical audit 219
 Clinical Dementia Rating (CDR) 93
 clinical risk assessment tool 36, 47
 Clinical Topics, breakdown of questions 2
 clomipramine 30
 clonazepam 28
 clonidine 126
 clozapine
 hypersalivation 18, 34
 levels, and hepatic metabolism alterations 18, 34
 Parkinson's disease psychosis 151
 clubhouses 58
 cocaine use
 comorbidity 111, 125
 detection in urine 129
 dopamine receptors and relapse susceptibility 123
 intracranial complications 111, 125
 phenomena associated with 112, 126
 cognitive analytical therapy 178
 cognitive-behavioural therapy (CBT)
 alcohol abuse 107, 119
 body dysmorphic disorder 32
 bulimia nervosa 175
 cardiovascular disease and depression 153
 cognitive distortions 164, 181
 collaborative empiricism 163, 178
 depression 175, 176
 dialectical behaviour therapy 177
 hypochondriasis 160, 174
 OCD 171
 post-traumatic stress disorder 180
 schemas 164, 181
 trauma-focused 180
 waiting times for 187, 214
 cognitive disturbance/distortions 170, 171
 HIV 136, 148
 hyperthyroidism 146
 hypothyroidism 146
 see also mild cognitive impairment
 cognitive stimulation therapy 97
 Cohen's d 225
 cohesion, group psychotherapy 177
 cohort studies 217
 methodological challenges 194, 222
 prospective 217, 219
 cold, phobia of 33
 'cold turkey' 127
 collaborative empiricism 163, 178
 community mental health teams 56
Companion to Psychiatric Studies 2
 compliance with treatment 44, 57
 concealment 220
 concurrent validity of an instrument 226
 conditional rules 170
 conditioned tolerance 123
 conduct disorder
 and antisocial personality disorder 41, 53
 attachment patterns predictive of 64, 76
 gender factors 62, 72
 maternal smoking during pregnancy 129
 parent management training 173
 predictors of poor outcome 66, 78
 confidence intervals
 calculation 194, 222
 characteristics 195, 223
 Forest plots 236
 odds ratio 232
 power of a study 212
 relative risk 231
 confidentiality 167
 breaches 54
 constipation, and opiate dependence 127
 contamination in trials 216
 continuous data 221
 control event rate (CER) 197, 225, 230
 conversion phenomenon 33
 coping, stages of 176
 core beliefs 170, 172
 core clinical psychiatry, books 6–7
 Cornell depression scale 92
 corrective emotional experience 169
 correlation analysis 197, 225
 corticosteroids, neuropsychiatric
 complications 134, 146
 cost-effectiveness acceptability curve (CEAC) 204, 233
 cost-effectiveness analysis 188, 203–4, 215, 232–3
 counter-transference 155, 166
 couples therapy 178
 covert sensitization 159, 172
 Creutzfeldt-Jakob disease (CJD) 87, 99
 variant 99
 crime rates 45, 128
 criminal parents, and delinquent children 40, 52
 crisis intervention 161, 176
 criterion validity of an instrument 226
 critical appraisal of research 2, 4
 books and journals 4, 7
 Critical Review component of paper 2
 Cronbach's alpha 225
 crossover trials 189, 216
 cross-sectional surveys 217, 219
 Cummings, Jeffrey 3
 curvilinear regression 215
 Cushing's disease 11, 23, 134, 146
 databases, medical 189, 216
 debriefing, post-traumatic stress disorder 180
 deductive approach in qualitative research 223
 defence mechanisms 156, 166
 degrees of freedom 190, 217
 deliberate self-harm (DSH)
 dialectical behaviour therapy 177
 epilepsy 142
 suicide 138, 151
 delinquency
 maternal smoking during pregnancy 129
 offences, common 66, 78
 and parental criminality 40, 52

- delirium
alcohol withdrawal (delirium tremens, DTs) see alcohol withdrawal delirium
anticholinergic 137, 149
cardinal feature 133, 145
corticosteroid-induced 146
EEG 137, 149
haloperidol 89, 101
hyperactive versus hypoactive 136, 149
hypothyroidism 146
post-operative 137, 149
- delusional disorder 42, 54
morbid jealousy 51
stalking 52
- delusions
alcohol abuse 126
late-onset schizophrenia 96
- dementia
activities of daily living 91
anticholinesterase trials 82, 92
antidementia drugs 90, 103, 104
drop-out rates 88, 101
mode of action 88, 101
- behavioural and psychological features, recording tool 82, 92
- care and well-being, evaluation of 83, 93
- conversion to, from mild cognitive impairment 86, 98
- depression 103
in caregivers 85, 96
screening for 205–6, 234–5
- elder abuse 103
- gingko biloba 102
- hospitalization trial 188, 215
- late-onset psychosis 85, 96
- neuropsychiatric symptoms, psychological management of 85, 97
- potentially reversible 89, 102
- psychosis 97
- screening tool 92
- social-psychological theory of care 93
- variant Creutzfeldt–Jakob disease 99
see also specific types of dementia
- Dementia Care Mapping (DCM) 93
- dementia with Lewy bodies (DLB)
cholinesterase inhibitors 104
extrapyramidal symptoms 84, 95
visual hallucinations 83, 94
- denial 166
- Denver developmental screening test 75
- depersonalization 193
- depression
adverse life events 13, 26
alcohol abuse 109, 118, 122
sertraline trial 202–3, 231–2
alcoholic hallucinosis, differential diagnosis 126
and bereavement, distinction between 10, 22
bipolar disorder see bipolar disorder
black and white thinking 181
in caregivers
and elder abuse 103
of people with dementia 85, 96
- catatonia in 21
characteristics of individuals prone to 13, 26
children 161, 175
chronicity, and ECT response 32
cocaine use 125
cognitive-behavioural therapy 164, 176, 181
Cornell depression scale 92
Cushing's disease 23, 146
dementia 92, 103
screening for 205–6, 234–5
due to a general medical condition see secondary depression
dysthymia 22, 147
- elderly people 100
late-onset versus early-onset 85, 96
poor antidepressant response 84, 95
relapse risk 84, 95
secondary depression 84, 95
suicide 100
exercise as preventive factor 189, 216
homelessness 56
homicide offenders 50
Huntington's disease 135, 147
hyperthyroidism 146
hyponatraemia in elderly people 82, 93
hypothyroidism 146
interpersonal psychotherapy 161, 175–6
learning disability 67, 79
and mild cognitive impairment 184, 210
multiple sclerosis 137, 150
neuroendocrine changes 19, 34
NIMH Treatment of Depression Collaborative Research Program 161, 176
parental loss 12, 26
peptic ulcers 144
post-myocardial infarction 139, 153
postpartum
agomelatine study 183, 209
risk of developing 140, 154
screening 139, 154
psychodynamic psychotherapy 155–6, 157, 165–7, 169
psychotherapy, cost-effectiveness analysis 203–4, 232–3
Quality of Life in Depression Scale 56
randomized controlled trials 184–5
receptor changes 30
recurrence, predictors of 10, 22
restless legs syndrome 28
reversible dementia 102
schizophrenia 45
screening for 198–201, 226–30
seasonal affective disorder 21
selective abstraction 170
sleep changes in 14, 27
somatic syndrome associated with 9, 21
study arms, allocation to 185
suicide risk 154
systemic lupus erythematosus 145
tryptophan depletion 15, 29
- descriptive statistics, dispersion measures 195, 223
deterrance theory, alcohol abuse 124
developmental difficulties, screening for 64, 75

- dhat syndrome 33
 diagnostic studies 217
 dialectical behaviour therapy 162, 163, 177, 180
 diazepam
 and acamprosate pharmacokinetics 122
 alcohol withdrawal seizures 116
 half-life in elderly people 82, 92
 withdrawal 109, 121
 dichotomous thinking 170
 diencephalic tumours 141
 dilemmas, cognitive analytical therapy 162, 178
 diminished responsibility, assessment of 46
 Diogenes syndrome 89, 102
 Disability Allowance 58
 discrete data 221
 disinhibited attachment disorder 73
 disorganized attachment 76
 dispersion measures 195, 223
 displacement 166
 dispositional tolerance 123
 dissociation 166
 distortion 166
 disulfiram
 and acamprosate pharmacokinetics 122
 learning theory behind supervised treatment 111, 124
 side-effects 109, 122
 disulfiram–ethanol reaction 122, 124
 diuretics, and lithium 24
 donepezil
 amnesia following carbon monoxide poisoning 192
 drop-out rates 101
 mode of action 101
 L-dopa 28
 dopamine 27
 receptors 110, 123
 dosulepin 184
 dothiepin 31
 double blinding 216
 doubles, psychodrama 179
 Down's syndrome
 behavioural and psychiatric disorders associated with 59, 69
 features 59, 69
 infantile spasms 80
 learning disability 71
 trisomy 21:70
 drop-outs 196, 224
 drug dependence, homicide offenders 49, 50
 DSM-IV
 alcohol dependence syndrome 105, 115
 alcoholic hallucinosis 126
 amphetamine intoxication 126
 child and adolescent psychiatry, multiaxial classification system 77
 delusional disorder 51
 depression 198, 201, 205, 234
 opiate withdrawal 127
 PANDAS 145
 pyromania 52
 reactive attachment disorder 62, 73
 seasonal affective disorder 21
 specific reading disorder 73
 specifiers 23
 DSM-IV-TR 27
 dynamic psychotherapy see psychodynamic psychotherapy
 dysfunctional assumptions 159, 172
 dyslexia 74
 dysthymia 9, 22
 early-onset dysthymia 22
 Ebstein's anomaly 12, 24, 152
 Edinburgh Postnatal Depression Scale 154
 effectiveness trials see pragmatic trials 217
 efficacy studies 224
 elder abuse 90, 103
 elderly people see old age psychiatry
 electrocardiogram (ECG) 11, 24
 electroconvulsive therapy (ECT)
 malignant catatonia 31
 receptor changes 30
 response rates 17, 32
 electroencephalogram (EEG)
 alcohol-induced versus epileptic seizures, differentiation between 116
 biofeedback 181
 diffuse slowing on 137, 149
 ECT response 32
 infantile spasms 68, 80
 periodic lateralizations 142
 electromyogram (EMG) 181
 eligibility to sit exam 1
 elimination of incorrect answers 5, 6
 empathy 165
 employment 44, 58
 enuresis, nocturnal 66, 78
 epidemiological studies 217, 219
 epilepsy
 and alcohol-induced seizures, differential diagnosis 106, 116
 deliberate self-harm 142
 dyslexia 74
 forced thinking 142
 infantile spasms 80
 peri-ictal psychosis 132, 143
 psychosis, lifetime prevalence 132, 142
 suicide risk 132, 142
 tuberous sclerosis 74
 violence 40, 52
 epileptic personality (Geschwind syndrome) 143
 erectile dysfunction 14, 15, 28
 erotomania 52
 erythromycin 34
 escitalopram 53
Essential Psychiatry 3
Evidence-based Mental Health Journal 4
 evidence-based practice 2
 examining the evidence, automatic thought modification 171
 exclusion of incorrect answers 5, 6
 executive dysfunction
 aggression and violence, risk of 49
 Binswanger's disease 99
 depression in elderly people 95

- exercise, as preventive factor in depression 189, 216
experimental event rate (EER) 230
explanatory versus pragmatic trials 190, 217
exponential regression 215
exposure and response prevention (ERP) 171
extended matching items (EMI) 1
external controls 222
external validity of a study 209, 211, 212
eye movement desensitization therapy (EMDR) 180
- factorial study design 189, 216
facts, trial of 36, 47
failsafe N 220
false negative (FN) rate 214
 calculation 201, 229
 receiver operator curve 234, 235
false positive (FP) rate
 calculation 201, 229
 receiver operator curve 234
family therapy 64, 162
 anorexia nervosa 75
 circular questioning 178
 depression 175
 goals 162, 178
 indications 64, 75
 paradoxical injunctions 178
fatal toxicity indices (FTIs) 31
fetishism 53
filicide 36, 46
finger–nose test 33
fire-setting 40, 52
first-generation antipsychotics (FGA) 152
fitness to plead 36, 46
fixed-effect model of meta-analysis 219
'floppy baby' syndrome 152
fluoxetine 175, 184
foetal alcohol syndrome (FAS) 59, 70, 108, 121
forced normalization 143
forced thinking 142
forensic psychiatry
 answers 45–58
 questions 35–44
Forest plots 236
fragile X syndrome 71
frame-shift errors 5
FRAMES acronym 163, 179
fraternicide 46
Freeman, C. 4
frigophobia 33
frontal lobe tumours 131, 141
frontotemporal dementia (FTD) 136, 148
 cholinesterase inhibitors 104
 Lund–Manchester criteria 94
 mania 100
frozen watchfulness 62, 73
functional communication training 174
funnel plots 220
- gabapentin 28
Gabbard's Textbook of Psychotherapeutic Treatments 4
galantamine 101
Galbraith plots 220, 221
- galvanic skin response (GSR) gauge 181
'games' 157, 170
gastrointestinal tract cancers 150
gender factors
 alcohol pharmacokinetics 120
 child psychiatry 62, 72
 conduct disorder 62, 72
general adult psychiatry
 answers 21–34
 questions 9–19
generalized anxiety disorder (GAD)
 attentional biases 181
 elderly people 100
 peptic ulcers 144
genetic anticipation 147
genitourinary tract cancers 150
Geschwind syndrome 143
gingko biloba 102
goitre 24
Goodman, R. 3
grief
 prolonged 10, 23
 stage theory 86, 97
 see also bereavement
grief psychotherapy 163
 psychodrama 179
 therapeutic factors, important 162, 177
 unresolved grief as phobic avoidance 85, 96
group study 4
guessing in exams 5–6
guided discovery 171
guided mourning 96
Guthrie, E. 3
gynaecological cancers 150
- habit reversal 159, 173, 174
Hachinski Ischaemic Score 81, 91
hallucinations see alcoholic hallucinosis; auditory hallucinations; visual hallucinations
haloperidol 89, 101, 103, 117
Hamilton Rating Scale for Depression 154
Handbook of Evidence-based Psychotherapies 4
Handbook of Liaison Psychiatry 3
Hare's checklist 46
Hayflick phenomenon 91
HCR-20 47
head tumours 131, 141
headaches, in children 79
health belief model of treatment compliance 44, 57
Helicobacter pylori 144
Henderson hospital project 57
heroin 114, 128
 see also opioid entries
hikikomori 33
hippocampal atrophy 98
HIV
 cognitive deficits 136, 148
 opportunistic infection 136, 149
 transmission 113, 128
HIV dementia 133, 144
Holmes and Rahe Social Adjustment Scale 29
homelessness 43, 56

- homicide offenders
 automatism 51
 contact with mental health services in previous year 38, 50
 mental disorders, common 38, 49
 psychosis 41, 53
 stranger homicides 38, 50
 homicide-suicides 42, 54
 homocystinuria 71
 housing instability 56
 humour 166
 Huntington's disease
 cognitive dysfunction 135, 147
 depression 135, 147
 features 147
 schizophrenia-like psychosis 92
 hyperactive delirium 136, 149
 hyperammonaemia 25
 hyperkinetic disorder 78
 hyperparathyroidism 146
 hypersalivation 18, 34
 hypertensive crises 16, 30
 hyperthyroidism 134, 146
 hypnosis 179
 hypoactive delirium 136, 149
 hypoalbuminaemia 149
 hypochondriasis 160, 174
 hypokalaemia 24, 32
 hypomania 146
 hyponatraemia 82, 93
 hypothyroidism
 depression 95
 lithium 24
 psychiatric symptoms 134, 146
 hypoxylphilia 53
 hypsarrhythmia 80

 I squared statistic 221
 ICD-10
 alcohol dependence syndrome 115
 alcoholic hallucinosis 126
 anxiety 183
 child and adolescent psychiatry 63, 65, 74, 77
 point prevalence of disorders 61, 72
 delusional disorder 51
 pyromania 52
 reactive attachment disorder 62, 73
 seasonal affective disorder 21
 somatic syndrome associated with depression 9, 21
 specific reading disorder 73
 specifiers 23
 stalking behaviour 40
 identity diffusion 168
 imagery 171
 imipramine 161, 176
 imitation 177
 immature defences 166
 impulse control defects 49, 52
 Incapacity Benefit 58
 incompetent stalkers 52
 incremental cost-effectiveness ratio (ICER) 203, 215, 232
 incremental net benefit (INB) 203, 233

 incremental validity of an instrument 226
 individual placement and support (IPS) model 58
 infantile spasms 68, 80
 information bias 216
 inhibited attachment disorder 73
 insanity defence 37, 48
 insomnia 103
 intellectualization 166
 intention to treat analysis 196, 224
 interferon beta 150
 intermediate beliefs 170
 internal consistency of a test 225, 226
 internal controls 222
 internal validity of a study 183, 209
 pragmatic randomized controlled trials 212
 randomized controlled trials 212, 217
 threats to 185, 211
 interpersonal deficits, interpersonal psychotherapy 175, 176
 interpersonal psychotherapy
 bulimia nervosa 175
 depression 161, 175–6
 inter-rater reliability (kappa statistic) 187, 209, 214, 225
 interquartile range 223
 intimacy-seeking stalkers 52
 introjection 166
 introspectiveness 169
 IQ levels
 autism 70
 lead's effect on 76
 learning disability 61, 72
 schizophrenia diagnosis 71
 testing in children 75
 irritable bowel syndrome (IBS) 132, 133, 143
 ischaemic stroke syndromes 135, 147
 Isle of Wight surveys 61, 72
 isolation 166
 isometric tension 179
 iterative approach in qualitative research 223
 Iterative Classification Tree 47

 Jacoby, R. 3
 jealousy, morbid 39, 51
 journal clubs 2
 journals 4
 juvenile delinquency
 maternal smoking during pregnancy 129
 offences, common 66, 78
 and parental criminality 40, 52

 Kanner, Leo 69
 Kaplan and Sadock's Comprehensive Textbook of Psychiatry 3
 Kaplan and Sadock's Synopsis of Psychiatry 4
 kappa statistic see inter-rater reliability
 Kingsley Hall 57
 kleptomania 41, 53, 54
 and shoplifting, difference between 54
 Korsakoff's dementia 107, 117
 Kraepelin, Emil 69

 l'Abbé plots 221
 L-dopa 28
 lamotrigine 193

- last observation carried forward (LOCF) method 191, 208
laxative abuse 32
lead, effect on IQ 76
learned tolerance 110, 123
learning disability (LD)
 answers 69–80
 classification 59, 69
 depression 67, 79
 Down's syndrome 71
 homocystinuria 71
 inherited causes 60, 71
 IQ levels 61, 72
 medications 68, 80
 mental health problems, screening for 67, 79
 and offending, association between 37, 47
 ordinary life, provision of 61, 71
 positive behavioural programming 160, 174
 questions 59–68
 schizophrenia 61, 71
 subcultural 60, 70
learning theory 173
leptokurtic normal distribution curve 223
Lesch Nyhan syndrome 70
Lewis, EO 69
Lewis's Child and Adolescent Psychiatry 3–4
Lewy body dementia see dementia with Lewy bodies
liaison psychiatry
 answers 141–54
 books 3, 7
 questions 131–40
Life Events and Difficulties Scale 26, 29
lifelong learning 3
likelihood ratio (LR) 183, 209
 for a negative test (LR-) 199, 228
 for a positive test (LR+) 199, 227
 and post-test probability 210
linear regression 215
Linehan, Marsha 177
Lishman's Organic Psychiatry 3
literature searches 216
lithium
 bipolar disorder 12, 25
 Ebstein's anomaly 12, 24
 ECG changes 11, 24
 electrolyte disturbances 11, 24
 polydipsia 24
 polyuria 11, 24
 teratogenicity 152
 thyroid dysfunction 11, 24
 toxicity 16, 30
Lloyd, G. 3
lofexidine 126
logarithmic regression 215
lorazepam 116
 challenge test 16, 31
low T3 syndrome 32
LSD 114, 129
Lund–Manchester criteria 83, 94
lung cancer 150

MacArthur competency assessment tool 46
magnification 170

malignant catatonia 16, 31
mania
 alcohol abuse 118
 bipolar disorder see bipolar disorder
 corticosteroid-induced 146
 hyperthyroidism 146
 late-onset versus earlier-onset 88, 100
MAO enzyme polymorphism 49
Marfan syndrome 71
marijuana 129
maricide 46
masochism 53
massed negative practice treatment 160, 174
MAST (Michigan alcohol screening test) 120
maternal smoking
 and children's school refusal 194, 222
 during pregnancy 49, 114, 129
matricide 46
mature defences 156, 166
McNaughton rules 37, 46, 48
mean 187, 193, 214, 221
 normal distribution 198, 226
measurement bias 217
median 187, 193, 214, 221, 223
medical databases 189, 216
medical negligence, assessment of 36, 46
medication resistance 32
melanoma 150
Melbourne PACE project 57
Mellanby effect 120
memantine 88, 101, 196–7
mentalizing 165
MeSH 189, 216
meta-analyses
 effect size analysis 206–7, 236
 heterogeneity
 assessing 193, 221
 decreasing 191, 219
 odds ratios 232
 reporting quality 193, 221
 sensitivity analysis 207, 237
meta regression 219
metastatic brain cancer 137, 150
methadone
 half-life in opioid dependence 113, 128
 opioid withdrawal 113, 126, 127, 128
 and street heroin, equivalent dose 114, 128
methamphetamine use 123
Michigan alcohol screening test (MAST) 120
micropsychotic episodes 168
mild cognitive impairment (MCI)
 amnestic 135, 147
 clinical features 83, 94
 conversion to dementia 86, 98
 and depression 184, 210
mindfulness 177
Mini Mental State Examination (MMSE) 92
 Alzheimer's disease, average annual decline in scores 82, 93
minimization (cognitive bias) 170
minimization (study arms, allocation to) 211
Minnesota Multiphasic Personality Inventory (MMPI) 47

- mirror technique, psychodrama 179
 mock tests 3, 5, 6
 modelling 173
 monoamine oxidase inhibitors (MAOIs)
 hypertensive crises 16, 30
 serotonin syndrome 150
 tryptophan depletion 29
 morality thought-action fusion 171
 Morel, Benoit 69
 Moreno, Jacob 179
 motivation, psychodynamic psychotherapy 169
 motivational enhancement therapy (MET) 107, 119
 motivational interviewing
 principles 110, 123
 rolling with resistance 179
 mourning see bereavement; grief
 MRCPsych Paper 3: 1–7
 multiple choice questions (MCQs) 1, 4–6
 multiple doubles, psychodrama 179
 multiple linear regression 215
 multiple regression analyses 223
 multiple sclerosis (MS) 137, 150
 multisensory stimulation 97
 Murray, Robin 3
 muscarinic acetylcholine receptors 16, 30
 mutual help 177
 myalgic encephalitis see chronic fatigue syndrome
 myocardial infarction 95, 139, 153
 myxoedema madness ‘psychosis’ 146
- n-of-1 trials 220
 naltrexone
 and acamprosate pharmacokinetics 122
 cost-effectiveness study 188, 215
 kleptomania 53
 narcissistic defences 166
 Neale analysis of reading 75
 negative predictive value (NPV) 215
 calculation 199, 201, 227, 230
 and prevalence of a disease, relationship between 214
 neglect of elderly people 103
 negligence, assessment of 36, 46
 neural tube defects 138, 152
 neurasthenia see chronic fatigue syndrome
 neurodevelopmental insult 49
 neuroleptic malignant syndrome (NMS)
 diagnostic features 13, 27
 laboratory abnormalities associated with 31
 and serotonin syndrome, differentiation
 between 27, 138, 150
 neuroleptics 117
 neurological soft signs, aggression and violence, risk of 49
 Neuropsychiatric Inventory (NPI) 92
 neuropsychiatry, books 3, 7
Neuropsychiatry and Behavioural Neuroscience 3
 neuroses, elderly people 87, 100
 neurotic defences 166
New Oxford Textbook of Psychiatry 3
 nicotine dependence see cigarette smoking
 nicotinic acid (niacin) skin patches 15, 29
 nocturnal enuresis 66, 78
 nocturnal panic attacks 14, 27
- nomograms 200, 228–9
 non-compliance with medication
 rates, estimation of 43, 55
 schizophrenia 45
 non-linear correlation 188, 215
 non-parametric correlation analysis 197, 225
 non-parametric statistics 225
 normal distribution
 blood pressure 196, 224
 central limit theorem 226
 characteristics 194, 195, 222, 223
 mean values of sample size 198, 226
 normalization, learning disability 71
 nortriptyline 142
 null hypothesis 194, 222
 area under the curve 235
 confidence intervals 223
 receiver operator curve 235
 number needed to harm (NNH) 184, 210
 number needed to treat (NNT) 184, 210, 215
 adapting 185, 211
 calculation 196, 224
 nystagmus 33
- obesity 13, 26
 observer bias 216
 obsessive-compulsive disorder (OCD)
 dysfunctional assumptions 159, 172
 kleptomania 53
 treatment 158, 171
 obstetric complications, and risk of aggression and violence 49
 occipital lobe tumours 141
 odds ratios 191, 219
 calculation 232
 Forest plots 236
 per protocol analysis 197, 224
 offending and learning disability, association between 37, 47
 olanzapine
 cholesterol levels study 194, 222
 contraindicated in Parkinson’s disease psychosis 151
 dementia 103
 hypersalivation 34
 old age psychiatry
 alcohol abuse 110, 124
 answers 91–104
 anticholinergic delirium 137, 149
 books 3, 7
 homicide–suicides 54
 questions 81–90
 sexual offenders 39, 50
 open label trials 216
 operant conditioning
 biofeedback 181
 token economy 174
 opioid dependence
 methadone half-life 113, 128
 tolerance 113, 127
 treatments 113, 128
 opioid withdrawal
 in pregnancy 113, 127
 symptoms 113, 127
 treatment 112, 126

- opioids
methadone and heroin, equivalent dose 114, 128
respiratory depressant action, receptors implicated in 114, 128
- opportunity costs 204, 233
- oppositional defiant disorder 173
- organic psychiatry
answers 141–54
questions 131–40
sexual offenders 50
- orgasmic reconditioning 159, 174
- Oriental flush syndrome 121
- Othello syndrome (morbid jealousy) 39, 51
- overgeneralization 170
- Oxford Shorter Textbook of Psychiatry* 2, 3
- Oxford Textbook of Old Age Psychiatry* 3
- Oxford Textbook of Psychotherapy* 4
- Pa-Leng 33
- PACE (Personal Assessment and Crisis Evaluation)
Clinic 57
- paired t test 221, 223
- PANDAS 134, 137, 145, 150
- panic attacks, nocturnal 14, 27
- panic disorder
alcohol abuse 118, 122
IBS 143
- paradoxical injunctions 178
- paradoxical normalization 143
- parametric correlation analysis 225
- parametric statistics, assumptions 197, 225
- paranoid delusions
elderly people 86, 96, 97
late-onset schizophrenia 96
- paranoid personality disorder 48
- parent management training 159, 173
- parental criminality and delinquent children 40, 52
- parental loss and depression 12, 26
- parietal lobe tumours 141
- Parkinson's disease
extrapyramidal symptoms 84, 95
psychosis 85, 96, 138, 151
- Parkinson's disease dementia
cholinesterase inhibitors 104
visual hallucinations 94
- partial hospitalization 57
- partition delusions 96
- passive-aggression 166
- Patau's syndrome 70
- pathological laughing and crying (PLAC)
syndrome 131, 142
- patient expected event rate (PEER) 211
- patricide 46
- Patterson, Gerald 173
- PCL-R 47, 48
- Pearson coefficient test 223
- Pearson's correlation 225
- peptic ulcers 133, 144
- per protocol analysis 197, 224
- pergolide 28
- peri-ictal psychosis 132, 143
- perinatal psychiatry
- answers 152, 153, 154
questions 138, 139, 40
- periodic lateralizations 142
- periodic limb movement disorder 28
- permissiveness 177
- perphenazine 51
- Personal Assessment and Crisis Evaluation (PACE)
Clinic 57
- personality disorder
comorbid schizophrenia 45
Henderson hospital project 57
homicide offenders 49, 50
prisoners 37, 48
suicide risk 154
- personalization 170
- pharmacodynamic tolerance 123
- pharmacokinetic tolerance 123
- phenothiazine 149
- phenytoin 34, 116
- phobias
alcohol abuse 122
blood–injury–injection 163, 179
elderly people 100
systematic desensitization 173
- phototherapy 21
- physical anomalies, risk of aggression and violence 49
- Piboloktoq 33
- Pick's disease 148
- pirenzepine 34
- pituitary tumours 141
- platykurtic normal distribution curve 223
- polydipsia 24
- polynomial regression 215
- polyuria 11, 24
- positive behavioural programming 174
- positive predictive power (PPP) 199, 201, 227, 230
- positive predictive value 186, 209, 213, 215
and prevalence of a disease, relationship between 214
- post-operative delirium 137, 149
- post-partum blues 140, 154
- post-partum depression
agomelatine study 183, 209
risk of developing 140, 154
screening tool 139, 154
- post-test probability 209
calculation 200, 228–9
and likelihood ratios 210
- post-traumatic stress disorder (PTSD)
predictive screening 15, 29
treatment 164, 180
- Power, M. 4
- power calculation 212
- power of a study 186, 212
- practice tests 3
- pragmatic trials (effectiveness trials) 185, 212, 224
versus explanatory trials 190, 217
- pramipexole 28
- predatory stalkers 52
- predictive power of a test 199, 227
- predictive validity of an instrument 226
- predictive value see negative predictive value; positive predictive value

- prednisolone 149
 pregnancy
 maternal smoking during 49, 114, 129
 opioid withdrawal 113, 126, 127
 sodium valproate 138, 152
 premenstrual dysphoric disorder (PMDD) 139, 153
 premenstrual syndrome (PMS) 153
 preparation for the exam 2–4, 6
 presenilin mutations 83, 93
 pretest probability 199, 209, 227
 prevalence of a disease, and screening test
 properties 187, 214
 primary ageing 91
 PRISMA 221
 prisoners
 personality disorder 37, 48
 psychiatric diagnosis 42, 54
 suicide 42, 55
 Pritchard's criteria 46
 probadility thought-action fusion 171
 Prochaska's stages of change model 111, 124
 prognostic studies 217, 219
 programmed cell death 91
 projection 166
 prolonged grief 10, 23
 propionate 25
 prospective cohort studies 217, 219
 protriptyline 30
 pruning 91
 Psychiatric Assessment Schedule for Adults with Developmental Disabilities (PAS-ADD) interview 80
 psychoactive drugs, psychodrama 179
 psychodrama 179
 psychodynamic psychotherapy 156, 168, 178
 brief 157, 169
 depression 155–6, 157, 165–7, 169
 predictors of good response in 157, 169
 psychogenic hypothesis, IBS and psychiatric comorbidity 143
 psychological mindedness 155, 165, 169
 psychopathy
 and antisocial personality disorder, relationship between 37, 48
 assessment 46
 neurobiological abnormalities 38, 49
 Psychopathy Check List – Revised (PCL-R) 47, 48
 psychosis
 alcoholic hallucinosis, differential diagnosis 126
 corticosteroid-induced 146
 crime rates 45
 Cushing's disease 23
 dementia 81, 92
 elderly people 81, 85, 86, 92, 96, 97, 100
 in epilepsy, lifetime prevalence 132, 142
 homicide offenders 41, 53
 hyperthyroidism 146
 hypothyroidism 146
 late-onset 85, 96
 not otherwise specified 71
 PACE Clinic 57
 Parkinson's disease 138, 151
 peri-ictal 132, 143
 prisoners 54
 sexual offenders 50
 tumours 141
 psychotherapy
 answers 165–81
 books 4, 7
 questions 155–64
 psychotic symptoms, violence 45
 puberty 65, 77
 publication bias
 determining 192, 220
 meta-analysis 219
 sensitivity analysis 237
 Pubmed-Medline 216
 pulvinar sign 87, 99
 pylorospasm 120
 pyromania 52
 Q statistic 221
 qualitative data 221
 qualitative research 196, 223
 quality of life (QOL) 43, 56
 Quality of Life in Depression Scale (QLDS) 56
 quantitative data 221
 question banks 4, 6
 quetiapine 103, 151
 QUOROM Statement 221
 random-effects model of meta-analysis 219
 random guessing in exams 5–6
 randomization 211
 randomized controlled trials 184–5, 210–11
 applications 217, 219
 bias 217
 blinding 216
 crossover design 189, 216
 disadvantages 190, 217
 factorial 189, 216
 inclusion and exclusion criteria 194, 222
 last observation carried forward method 191, 218
 meta-analyses 206–7, 236
 multi-arm 216
 pragmatic 212
 versus explanatory 190, 217
 randomization sequence protection 192, 220
 treatment guesses by outcome assessors 197, 225
 underpowered 212
 range 223
 rank correlation test see Spearman's correlation
 reaction formation 166
 reactive attachment disorder (RAD) 62, 73
 reading age 62, 73
 reading list 6–7
 reality orientation therapy 97
 recall bias 217
 receiver operator curve (ROC) 234–5
 receptor changes, pairings 15, 30
 recovery, schizophrenia 55
 refeeding syndrome 33
 reference books 2, 3–4, 6–7
 regression (defence mechanism) 166
 regression analyses 223

- rehabilitation psychiatry
answers 45–58
questions 35–44
rejected stalkers 52
relative risk 191, 219
calculation 196, 224, 231
relaxation
biofeedback 164, 181
contraindicated in post-traumatic stress disorder 180
systematic desensitization 173
reliability of an instrument 226
REM sleep behavioural disorder 28
reminiscence therapy 97
remission, schizophrenia 43, 55
repression 166
research methodology, books 7
resentful stalkers 52
resistance 168
restless legs syndrome 14, 28
Rett's disorder 79
reverse tolerance 123
revision 3, 4
rifampicin 34
rimonabant 13, 26
risk difference 231
risk ratio 231
risperidone 103, 151
rivastigmine 101
role disputes 175
role modelling 177
role-play 171
role reversal 178, 179
rootlessness 56
Rutter, Sir Michael 3
- sadism 53
Sadock's Synopsis of Psychiatry 3
Sally and Anne Task 79
schema avoidance 172
schema-based therapy 158, 172
schema compensation 172
schema surrender 172
schizophrenia
alcohol abuse 118
alcoholic hallucinosis 123
catatonia in 9, 21
crime rates 35, 45
diagnostic test 186–7, 213–14
external stimuli, increased significance of 13, 27
homelessness 43, 56
homicide offenders 49, 50, 53
late-onset 85, 96
learning disability 61, 71
nicotinic acid flush response 29
recovery 44, 55, 57
remission 43, 55
sexual offenders 50
stalking 52
suicide risk 154
token economy 174
very-late-onset schizophrenia-like psychosis (VLOSLP) 96
- violence, risk of 35, 36, 45, 46
reduction 39, 51
Violence Risk Appraisal Guide 47
vocational rehabilitation 44, 58
schizophrenia-like psychosis 81, 92
school refusal 194, 222
Scott, S. 3
seasonal affective disorder (SAD) 9, 21
second-generation antipsychotics (SGA) 152
secondary ageing 91
secondary depression 84, 95
sedative-hypnotic withdrawal syndrome 121
seizures
alcohol withdrawal 106, 116
Down's syndrome 69
epileptic versus alcohol-related 106, 116
psychic aura 132, 142
selection bias
allocation concealment 220
publication bias as type of 220
reducing 217
selective abstraction 170
selective serotonin reuptake inhibitors (SSRIs)
body dysmorphic disorder 32
cardiovascular disease and depression 153
fatal toxicity indices 31
hyponatraemia in elderly people 93
kleptomania 53
OCD 171
premenstrual dysphoric disorder 153
randomized controlled trials 185, 211
serotonin syndrome 138, 150
social anxiety disorder, length of trial 17, 32
tryptophan depletion 29
self-harm see deliberate self-harm
self-selection model, IBS and psychiatric comorbidity 143
sensitivity analysis, meta-analyses 207, 237
sensitivity of a test 186, 213, 214, 215
calibration 198, 226
receiver operator curve 206, 234, 235
sensitization 123
serotonin blood levels 79
serotonin syndrome and neuroleptic malignant syndrome, differentiation between 27, 138, 150
sertraline 153, 202–3, 231–2
sexual abuse
of children 55
of elderly people 103
sexual offenders 39, 50
shaping 173
sheltered employment model 58
shoplifters 41, 54
sildenafil 28
single blinding 189, 216
sleep
bipolar disorder 27
depression 14, 27
disturbances 14, 28
nocturnal panic attacks 14, 27
sleep terrors 28
sleepwalking 28
Smith–Magenis syndrome 70

- smoking see cigarette smoking
 snags, cognitive analytical therapy 162, 178
 Snoezelen therapy 97
 social anxiety disorder 17, 32
 social phobia 18, 33
 social-psychological theory of dementia care 93
 Socratic questioning 171, 178
 sodium valproate 12, 25, 138, 152
 soliloquies, psychodrama 179
 somatic syndrome 9, 21
 somatization disorder hypothesis, IBS and psychiatric comorbidity 143
 somatopsychic hypothesis, IBS and psychiatric comorbidity 143
 soricide 46
 Soteria paradigm 57
 spasms, infantile 68, 80
 Spearman's correlation 225
 specialty topics 2
 specific reading disorder 62, 63, 73, 74
 specificity of a test 214, 215
 1 – specificity 205, 234
 calculation 198, 227
 receiver operator curve 206, 234, 235
 specifiers 10, 23
 stage theory of grief 86, 97
 stalking 40, 52
 standard deviation 192, 220, 223
 normal distribution curve 194, 222
 standard drift fallacy, QOL studies 56
 standard error 223
 Stanford Binet test 75
 statistical significance 221
 statistics
 answers 209–37
 questions 183–207
 status epilepticus 106, 116
 Strange Situations procedure 65, 76
 stranger homicides 38, 50
 stratified randomization 211
 Streiner, David 4
 stress
 Cushing's syndrome 146
 peptic ulcers 144
 systemic lupus erythematosus 145
 'strokes' 157, 170
 studitation madness 33
 study leave 6
 stuttering 74
 subcultural learning disability 60, 70
 subcultural mental handicap 69
 subgroup analysis, meta-analysis 219
 sublimation 166
 substance abuse
 answers 115–29
 books 4
 by caregivers, and elder abuse 103
 questions 105–14
 schizophrenia 45
 shoplifters 54
 suicide risk 154
 token economy 174
 suicide
 alcohol abuse 107, 118, 122, 154
 anxiety 154
 associated psychiatric disorders 139, 154
 contact with psychiatric services within
 1 week of 139, 154
 deliberate self-harm 138, 151
 depression 154
 elderly people 88, 100
 epilepsy 132, 142
 homicide–suicides 42, 54
 Huntington's disease 147
 multiple sclerosis 150
 pacts 54, 100
 personality disorder 154
 prisoners 42, 55
 receptor changes 30
 risk assessment test 183, 209
 schizophrenia 154
 substance abuse 154
 supported employment model 58
 support-till-placement models 58
 suppression 166
 surveys 217
 syndrome of inappropriate antidiuretic hormone (SIADH) 93
 systematic desensitization 159, 173
 systematic reviews 192, 193, 220, 221
 systemic lupus erythematosus (SLE) 134, 145
 systems approach to psychotherapy 178
 tacrine 101
 tadalafil 28
 Taijin Kyofusho 33
 Tanner staging 77
Tarasoff v The Regents of the University of California et al. 54
 temazepam 185, 211
 temper tantrums 64, 75
 temporal lobe tumours 141
 test-taking strategies 5–6
 testamentary capacity 88, 100
 textbooks 2, 3–4, 6–7
 therapeutic communities 162, 177
 therapeutic interventions, study design 217, 219
 thermistor 181
 thiamine deficiency 33
 thiamine replacement therapy 106, 107, 117, 118
 thought-action fusion (TAF) 171, 172
 thought-shape fusion 171
 thyroid dysfunction 11, 24
 thyroid-stimulating hormone (TSH) 24, 32
 thyroxine 32
 tic disorder 174
 time frame for attempting MRCPsych Paper 3: 1
 time management in exams 4, 5
 token economy 58, 160, 174
 tolerance 113, 127
 toxoplasmosis 149
 train and place models 58
 training requirements 1
 transactional analysis 170
 transference 155, 166

- tranylcypromine 16, 30
traps, cognitive analytical therapy 162, 178
trauma-focused cognitive-behavioural therapy 180
Trauma Screening Questionnaire (TSQ) 29
trazodone 30, 185, 211
trial of facts 36, 47
tricyclic antidepressants (TCAs)
 anticholinergic side-effects 30
 contraindications 146
 EEG 149
 fatal overdose 16, 31
trigonometric regression 215
triple blinding 216
trisomy 13: 70
trisomy 21: 70
 see also Down's syndrome
tryptophan depletion 15, 29
tuberous sclerosis 74, 80
tubular fields 33
tumours 131, 141
twelve-step facilitation programmes (TSFs) 107, 119
twilight states 143
twins, autism risk 77
- ulcers 133, 144
underpowered trials 212
unemployment 58
unfitness to plead 47
universalization 177
- validation therapy 97
validity of an instrument 198, 226
valproate see sodium valproate
vardenafil 28
variance 220, 223
variant Creutzfeldt-Jakob disease (vCJD) 99
vascular dementia
 and Alzheimer's dementia, differentiation
 between 81, 91
 cholinesterase inhibitors 104
 subtypes 87, 99
venlafaxine 31
- very-late-onset schizophrenia-like psychosis (VLOSLP) 96
victimization, childhood 60, 71
Villa 21: 57
violence
 epileptic automatism 40, 52
 learning disability 47
 psychiatric illness 35, 46
 psychopathy 48
 risk in absence of serious mental illness 38, 49
 schizophrenia 35, 36, 39, 45, 46, 51
Violence Risk Appraisal Guide (VRAG) 37, 47
visual hallucinations
 Charles Bonnet syndrome 102
 dementia with Lewy bodies 83, 94
 late-onset schizophrenia 96
 Parkinson's disease dementia 94
visual loss, sudden-onset 18, 33
visual word blindness 74
vocational rehabilitation 44, 58
Volkmar; A.M.F.R. 3
vomiting in eating disorder 17, 32
voyeurism 53
- warfarin 102
Wechsler intelligence scale for children 75
Wernicke's encephalopathy
 and Korsakoff's dementia 107, 117
 mortality in absence of thiamine replacement
 therapy 106, 117
refeeding syndrome 33
risk factors 118
West syndrome 80
Wilcoxon rank sum test 223
will, competency to make a 88, 100
Williams syndrome 70
Wolpe, Joseph 173
word blindness 74
workplace based assessments (WPBA) 1
- yohimbine 28
- zolpidem 103