Chapter 1

Test questions: 1

Questions: MCQs

For each question, select one answer option.

NEUROSCIENCES: NEUROANATOMY

1. Which of the following is the commonest neuroglia found in the peripheral nervous system?

A Astrocytes
B Ependymal cells
C Microglia
D Oligodendrocytes
E Schwann cells

2. A 45-year-old woman was diagnosed with an intrinsic brain tumour. Which of the following is the most likely tumour?

A Chordoma
B Epidermoid
C Meningioma
D Neuroma
E Oligodendroglioma

3. Which of the following brain structures include a dentate nucleus?

A Cerebral hemisphere
B Cerebellum
C Medulla oblongata
D Midbrain
E Pons

4. Astereognosis is the inability to recognise objects by touching and is linked to Brodmann's areas. Which of the following Brodmann's areas are affected in a stereognosis?

A 5, 7
B 8, 9
C 9, 10
D 18, 19, 20
E 22, 42

5. Which of the following is most likely to be due to a lesion in left Brodmann's areas 39 and 40?

A Acalculia
B Agraphia without alexia
C Alexia with agraphia
D Alexia without agraphia
E Gerstmann's syndrome

NEUROSCIENCES: NEUROPATHOLOGY

6. Which of the following about the neuropathology of schizophrenia is correct?

A Increase in temporal lobe volume
B No reduction in the anteroposterior length of the cerebral hemisphere
C Parahippocampal gyrus is significantly smaller
D Significant differences found in hippocampal area
E Slight and insignificant reduction in brain mass

7. Which of the following are characteristic changes seen in patients with the punch-drunk syndrome?

A Cerebral hypertrophy
B Neuronal hyperplasia
C Perforation of the septum pellucidum
D Thickening of the corpus callosum
E Ventricular shrinkage

8. A 72-year-old man was diagnosed with Alzheimer's disease. Which of the following brain regions sustain most atrophy change?

A Basal ganglia
B Cerebellum
C Locus ceruleus
D Substantia nigra
E Temporal lobe

9. A 42-year-old man was diagnosed with Pick's disease. Which of the following pathological features is most likely to be found?

A Global brain atrophy
B Knife blade gyri
C Sulcal widening
D Symmetrical atrophy of the anterior temporal lobes
E Ventricular shrinkage

10. Which of the following is the characteristic pathological feature of Creutzfeldt–Jakob disease?

A Generalised cerebral atrophy
B Neurofibrillary tangles
C Neuritic plaques
D Neuronal loss
E Ventricular shrinkage

NEUROSCIENCES: NEUROPHYSIOLOGY

11. Which of the following regulates growth hormone from the anterior pituitary gland?

A Combined growth hormone-releasing hormone (GHRH) and somatostatins
B GHRH
C Prolactin
D Somatostatins
E Thyroid-stimulating hormone

12. Which of the following is a ligand-gated channel?

A Calcium channels
B Calcium-activated potassium channel
C Glutamate receptors
D Na^+ channels
E Potassium channels

13. Each electroencephalogram (EEG) electrode placement allows it to preferentially record over a cortical surface area. What is the approximate area covered by an EEG electrode?

A 2 cm^2
B 4 cm^2
C 6 cm^2
D 8 cm^2
E 10 cm^2

14. Which of the following statements about the sinusoidal waveform EEG is correct?

A Both extracellular and intracellular components are recorded on the EEG
B The waveform generated by direct excitatory and inhibitory interaction of neighbouring cortical cell columns
C The waveform is an indirect consequence of the additive effect of groups of cortical pyramidal neurons
D Polymorphic activity is usually sinusoidal
E There is variations in both the strength and the density of the current loops

NEUROSCIENCES: NEUROENDOCRINOLOGY

15. Which of the following describes cortisol accurately?

A Acts via dopamine receptors
B Elevated serum concentration in the morning
C Negative feedback on hypothalamus
D Positive feedback on pituitary
E Released from adrenal medulla

NEUROSCIENCES: NEUROCHEMISTRY

16. Which of the following is a monoamine neurotransmitter?

A Acetylcholine
B Growth hormone-releasing hormone
C Glycine
D Glutamate
E Neurotensin

17. Which of the following is the main effector of dopaminergic receptors?

A D_1 – increase adenylyl cyclase
B D_1 – decrease adenylyl cyclase
C D_2 – increase adenylyl cyclase
D D_3 – increase adenylyl cyclase
E D_4 – increase adenylyl cyclase

18. Which of the following peptide secretions from neurons is released directly into the blood?

A Neurohormone
B Neuromediator
C Neuromodulator
D Neurotransmitter
E Neurotrophin

19. Which of the following is consistent with *N*-methyl-D-aspartate receptors?

A Excitatory amino acid neurotransmitter
B Binding site for γ-aminobutyric acid
C Hyperfunction associated with schizophrenia
D Metabotrophic receptor
E Type of glycine receptor

NEUROSCIENCES: NEUROIMAGING

20. A 67-year-old man underwent MRI recently. The scan showed focal atrophy of the caudate nucleus. What is the most likely diagnosis?

A Huntington's disease
B Hallervorden–Spatz disease
C Substance abuse including alcohol
D Long-term alcohol abuse
E Parkinson's disease

21. In which of the following conditions will MRI investigation show evidence of plaques in well over 90% of cases?

A Beçhet's disease
B Leukodystrophies
C Multiple sclerosis
D Normal ageing
E Sarcoidosis

22. Which of the following imaging modalities involves the BOLD technique?

A CT
B Functional MRI (fMRI)
C MRI
D Positron emission tomography (PET)
E Single photon emission computed tomography (SPECT)

23. Which of the following is used in clinical practice to measure glutamate, urea and ammonia?

A ^{13}C
B ^{14}N
C ^{23}Na
D ^{17}O
E ^{31}P

PSYCHOPHARMACOLOGY: PHARMACOKINETICS

24. What is the mechanism of action of lofexidine?

A α_2-Receptor agonist
B α_2-Receptor antagonist
C α_2-Receptor inverse agonist
D Monoamine reuptake inhibitor
E Serotonin reuptake inhibition

25. Which of the following drugs is a partial μ agonist?

A Buprenorphine
B Bupropion
C Buspirone
D Busulphan
E Butyrophenone

26. Which of the following statements applies to the pharmacokinetic properties of most psychotropic drugs?

A Most of them are affected by second-pass metabolism
B Most of them are minimally bound to proteins in the plasma
C They are poorly absorbed from the gut
D They are poorly ionised at a physiological pH
E They pass easily from plasma to the brain because they are hydrophilic

27. Which of the following statements about the effects of ageing on pharmacokinetics is correct?

A The receptor sensitivity is not affected
B The unbound proportion of albumin-bound drugs decreases
C The rate of absorption is increased
D The total amount of drug absorbed is reduced
E The volume of distribution increases for lipid-soluble drugs

28. Which of the following antipsychotics is not a substrate for cytochrome P450CYP450-2D6?

A Aripiprazole
B Clozapine
C Olanzapine
D Paliperidone
E Risperidone

29. Carbamazepine is not available as an intravenous injection. What is the most likely reason?

A It can cause severe allergic reaction
B It has a short half-life
C It is highly insoluble in water
D It is highly toxic as an intravenous preparation
E It rapidly distributes into all the tissues

30. A 32-year-old man had epilepsy. He was treated with carbamazepine 200 mg twice a day. His last serum carbamazepine levels were within normal limits. He was brought to the emergency department after a seizure and his carbamazepine levels were noticed to be low. He had been taking medication regularly, did not use illicit drugs or alcohol and was not on any other medication. What is the most likely explanation?

A Carbamazepine could be absorbed less in the intestine
B Carbamazepine induces its own metabolism
C Carbamazepine is highly water soluble
D Renal excretion of carbamazepine is increased
E There is no reason for his blood levels to be low

PSYCHOPHARMACOLOGY: PHARMACODYNAMICS

31. Which of the following explains varenicline's mechanism of action?

A Antagonist on serotonergic receptors
B Blocks dopamine receptors
C Inverse agonist on acetylcholine receptors
D Partial agonist on acetylcholine receptors
E Stimulating release of glutamate

32. Which of the following sets of benzodiazepines is correctly arranged in decreasing order of potency?

A Alprazolam, clonazepam, lorazepam, diazepam, midazolam
B Alprazolam, clonazepam, lorazepam, midazolam, diazepam
C Alprazolam, clonazepam, midazolam, lorazepam, diazepam
D Alprazolam, lorazepam, clonazepam, midazolam, diazepam
E Clonazepam, alprazolam, lorazepam, midazolam, diazepam

33. Which of the following is the most potent inhibitor of CYP450-2D6?

A Bupropion
B Duloxetine
C Fluvoxamine
D Reboxetine
E Sertraline

34. Which of the following statements explains the mechanism of action of sildenafil?

A By inducing the enzyme phosphodiesterase V, it raises the levels of cyclic guanosine monophosphate (cGMP)
B By inducing the enzyme phosphodiesterase V, it reduces the levels of cGMP
C By inhibiting the enzyme phosphodiesterase V, it raises the levels of cGMP
D By inhibiting the enzyme phosphodiesterase V, it reduces the levels of cGMP
E By inhibiting the enzyme phosphodiesterase V, it has no effect on the levels of cGMP

35. Which of the following explains the mechanism of action of zopiclone?

A Binding to γ-aminobutyric acid type A (GABA-A) and GABA-B receptors
B Non-selective binding to α-subunits of GABA-A receptors
C Selective binding to α_1-subunit of GABA-A receptors
D Selective binding to the γ subunit of GABA-C receptors
E Selective binding to the Z subunit of GABA-A receptors

36. A 34-year-old woman had depression. She was on fluoxetine 60 mg once a day. Her clinician reduced the dose to 40 mg a day and added mirtazapine 15 mg once a day. Next day, she developed fever, tachycardia, muscle twitches and confusion. Which of the following can explain this reaction?

A Idiosyncratic reaction
B Pharmacodynamic interaction
C Pharmacokinetic interaction
D Pharmacological agonism
E Pharmacological reaction

37. Which of the following statements about myristoylated alanine-rich C kinase substrate (MARCKS) is correct?

A MARCKS is a protein kinase substrate
B MARCKS is a substrate of carbamazepine
C MARCKS is implicated in the treatment of epilepsy
D MARCKS is implicated in the treatment of pain
E There is significant down-regulation of MARCKS with repeated use of carbamazepine

38. Which of the following anti-dementia drugs has the longest half-life?

A Donepezil
B Galantamine
C Memantine
D Rivastigmine
E Tacrine

PSYCHOPHARMACOLOGY: ADVERSE REACTIONS

39. Which of the following adverse effects of clozapine is independent of dose?

A Hypersalivation
B Hypotension
C Neutropenia
D Seizures
E Weight gain

40. Which of the following is a risk factor for QTc prolongation on an ECG and arrhythmia?

A Anorexia nervosa
B Hypermagnesaemia
C Male gender
D Right ventricular hypertrophy
E Tachycardia

41. A 43-year-old man with chronic schizophrenia is being treated with depot antipsychotic injections. He is seen in the outpatient clinic because he has had motor side effects. Which of the following is the most appropriate scale for a baseline assessment and subsequent follow-up?

A Barnes' akathisia rating scale
B Brief psychiatric rating scale
C Bush–Francis scale
D Simpson-Angus scale
E Unified Parkinson's disease rating scale

PSYCHOPHARMACOLOGY: THEORIES OF ACTION

42. Which of the following is the most appropriate drug to treat poststroke depression?

A Agomelatine
B Lofepramine
C Mianserin
D Mirtazapine
E Venlafaxine

43. Which of the following drugs is currently licensed in the UK for treatment of generalised anxiety disorder?

A Gabapentin
B Lamotrigine
C Pregabalin
D Tiagabin
E Vigabatrin

44. A 32-year-old woman with a past history of three manic episodes and one inpatient admission is stabilised on haloperidol and lithium. The last episode occurred 2 years ago. She has recently discovered that she is 6 weeks pregnant. What is the best course of action?

A Continue both the drugs without any change
B Continue haloperidol and lithium in reduced dosages
C Stop both the drugs and monitor patient closely
D Stop lithium and continue haloperidol
E Stop lithium and switch haloperidol to chlorpromazine

45. Who established that clozapine is effective in treating treatment-resistant schizophrenia?

A John Cade
B John Kane
C Max Fink
D Nancy Andreasen
E Pierre Deniker

PSYCHOPHARMACOLOGY: DRUG DEPENDENCE

46. Which of the following statements about disulfiram is correct?

A It inhibits alcohol dehydrogenase
B It is a reversible inhibitor of the enzyme
C It should be used at least 12 hours after the last alcohol ingestion
D Its use with alcohol can cause hypotension
E Its use with alcohol can lead to decreased levels of acetaldehyde in the blood

47. A 44-year-old man was admitted for alcohol detoxification. He has alcoholic cirrhosis of the liver and his blood investigations showed that his liver enzymes were raised. Which of the following drugs is most appropriate for detoxification?

A Carbamazepine
B Chlordiazepoxide
C Clonazepam
D Diazepam
E Oxazepam

GENETICS: CELLULAR AND MOLECULAR GENETICS

48. In which of the following stages of mitosis does the division of cytoplasm start?

A Anaphase
B Interphase
C Metaphase
D Prophase
E Telophase

49. Which genetic material is most suitable for postmortem studies of gene expression?

A DNA
B Gene
C mRNA
D Protein
E tRNA

50. Which of the following studies is appropriate to answer the question: 'What are the relative contributions of genes and environment?'

A Association analysis
B Family study
C Heritability study
D Linkage analysis
E Twin adoption study

51. What is the production of new copies of RNA from DNA called?

A Modification
B Replication
C Termination
D Transcription
E Translation

52. Which of the following statements about heritability in psychiatric genetics is correct?

A It is measured by the disconcordance rate among twin pairs
B It is a ratio of genetic variance to phenotypic variance
C It is a ratio of phenotypic variance to genetic variance
D It is the proportion of proband twins who have an affected co-twin
E It is the proportion of twin pairs when both of them are affected with the disorder

53. In the example, 'two relatives from same family sharing a common disorder have two alleles in common; one is at LOCI-1 and the other at LOC-2. Co-inheritance of these two alleles along with the disorder in the family tree suggests that some unobserved risk gene for the disorder is present near the loci.' What principle is applied in this case?

A Functional analysis
B Gene-dosage effect
C Genomic rearrangement
D Linkage analysis
E Linkage disequilibrium

54. Which of the following methods is used to determine whether a particular gene variant directly affects the risk for the disorder?

A Categorical gene analysis
B Genetic association analysis

C Genetic recombination analysis
D Genetic expressive analysis
E Genetic linkage analysis

55. Which of the following is correct if very tight linkage occurs between genetic markers in a haplotype?

A Logarithm of odd score will be 3 or 3+
B Markers will not undergo recombination and will be inherited together
C Markers will not undergo recombination and will not be inherited separately
D Markers will undergo recombination and will be inherited together
E Markers will undergo recombination and will not be inherited separately

56. What is the main difference between association studies and linkage studies?

A For association studies, the DNA marker has to be in the disease gene itself
B For linkage studies, the DNA marker has to be very tightly linked to the disease gene
C Linkage analysis has demonstrated strong links between the human leukocyte antigen system and several diseases
D Mutation analysis of polymorphisms is done by linkage analysis
E Association analysis can be used to 'scan the genome'

57. Which of the following statements about gene expression is correct?

A Genetic information flows from RNA to DNA to polypeptides
B Most genes encode peptides and are transcribed by RNA polymerase 2
C RNA splicing, capping and polyadenylation are pretranscriptional
D Tryptophan is specified by several codons
E Usual termination codon is AUG

GENETICS: BEHAVIOURAL GENETICS

58. What is the commonest cause of inherited learning disability?

A Down's syndrome
B Fragile X syndrome
C Phenylketonuria
D Trisomy X
E Tuberous sclerosis

59. Which of the following perturbations is most convincingly linked with aggregates in families in panic disorder of adults?

A Heart rate perturbations
B Respiratory perturbations
C Salivary fluid secretion perturbations
D Sweating rate perturbations
E Temperature regulation perturbations

60. In a third of children with autism, there is an increased peripheral level of a neurotransmitter. Which of the following neurotransmitters is implicated?

A Catecholamine
B Dopamine
C γ-Aminobutyric acid
D Glutamate
E Serotonin

61. What is the percentage ratio genetic liability: depression by direct effect or indirect effect respectively?

A 20:80
B 40:60
C 50:50
D 60:40
E 80:20

62. The concordance rate of bulimia nervosa in dizygotic twins is 30%. What is the likely concordance rate in monozygotic twins?

A 15%
B 35%
C 45%
D 50%
E 55%

63. Which of the following terms describes the probability of manifestation of a disorder given a particular genotype?

A Ascertainment
B Expression
C Gamete imprinting
D Gamete penetrance
E Penetrance

GENETICS: ENDOPHENOTYPES

64. Which of the following personality traits is an endophenotype for suicide behaviour?

A Borderline – hysterical continuum
B Impulsive – assertiveness continuum
C Neuroticism
D Paranoid – schizoid continuum
E Schizoid – schizotypal continuum

65. Which of the following is the neurochemical endophenotype in suicidal behaviour?

A Cerebrospinal fluid 5-hydroxyindoleacetic acid A (5-HIAA) levels
B Serum 5-HIAA levels
C Serum cortisol levels
D Urinary vanillylmandelic acid levels
E Urinary 5-HIAA levels

66. Which of the following electroencephalogram (EEG) changes have been used as an endophenotype in linkage studies for alcohol dependence?

A Frontal δ activity
B K-complexes
C Low-voltage α activity
D Occipital Ω activity
E Spindle activity

GENETICS: GENETIC EPIDEMIOLOGY

67. Which of the following factors about the family history of alcoholism is correct?

A Behavioural disturbances in childhood are associated with higher rates of alcoholism
B Children of alcoholics are less likely to be exposed to high-risk environments
C Female alcoholics with a family history of alcoholism have poorer outcomes
D Late onset of alcoholism is associated with increased rates of alcoholism in the family
E The rates of familial alcoholism are independent of socioeconomic status

68. Which of the following statements is one of the results of the Irish affected sibling pair study?

A Alcohol dependence is environmentally mediated
B Chromosomal variations in chromosome 14 are strongly related to alcoholism
C Chromosomal variations in chromosome 3 are strongly related to alcoholism
D Chromosomal variations in chromosome 4 are strongly related to alcoholism
E Chromosomal variations in chromosome 21 are strongly related to alcoholism

69. In which of the following conditions is the effect of genetic predisposition strongest?

A Anxiety disorders
B Autism
C Bipolar affective disorder
D Eating disorder
E Schizophrenia

70. Which of the following transcription factors is implicated in anxiety, alcohol abuse and substance dependence?

A C-fos
B C-Jun
C CREB
D FRA1
E TATA motif

GENETICS: GENE–ENVIRONMENT INTERACTION

71. Which of the following statements about cannabis-induced psychosis is correct?

A Cannabis misuse causing psychosis is an intoxication phenomenon
B Cannabis misuse causing psychosis is reversible in all individuals
C If a boy misuses cannabis from 11 years of age and stops in a year, the chances of developing psychosis are the same as in the general population
D Individuals with the COMT (catechol-*O*-methyl transferase) gene *met/met* allele are at high risk of developing cannabis-induced psychosis
E Individuals with the COMT gene *val/val* allele are at high risk of developing cannabis-induced psychosis

72. What does the term 'envirome' mean?

A Internal as well as external environment of the individual
B The environmental factors that predispose as well trigger psychiatric disorders
C The immediate environment of an individual in which he or she lives
D The internal environment of the individual that leads to a psychiatric disorder
E The work and household environment of an individual that are stressful and lead to a psychiatric disorder

73. Abnormalities of chromosomes can lead to a psychosis that is similar to schizophrenia. Which of the following chromosomes is implicated in psychosis?

A Chromosome 16
B Chromosome 22
C Chromosome 4
D Chromosome 8
E Chromosome X

74. What does the term 'ontogenic niche' mean?

A The ecological and social settings that an individual shares with parents
B The ecological and social settings that an individual shares with peers
C The ecological environment in which a person lives that modifies the genes
D The internal environment of an individual that modifies the genes
E The social environment in which a person lives that modifies the genes

75. You conducted a family study of patients with recurrent depressive disorder. Your findings showed that there was an increased risk of developing depression in parents' siblings and offsprings as probands, whereas second- and third-degree relatives do not have the increased risk. What does this mean?

A Environmental factors play a more important role in the development of depression than genetic factors
B Genetic factors play a more important role in the development of depression than environment
C There is no role for environmental factors in the development of depression
D There is no role for genetic factors in the development of depression
E This finding does not give any conclusive evidence as to whether genetic or environmental factors play a major role in the development of depression

EPIDEMIOLOGY: SURVEYS ACROSS THE LIFESPAN

76. What is the 12-month prevalence of mental disorders in Europe?

A 1 in 4
B 1 in 6
C 1 in 10
D 1 in 20
E 1 in 100

77. According to a 10-year follow-up study of patients with borderline personality disorder, what is the median time to remission of the abandonment symptom?

A 0–2 years
B 2–4 years
C 4–6 years
D 6–8 years
E 8–10 years

78. What is the reported prevalence of late-onset paraphrenia among elderly people in the community?

A <1%
B 1–5%
C 5–10%
D 10–15%
E >15%

79. What is the prevalence of late-onset paraphrenia in elderly people in a psychiatric hospital population?

A 5%
B 10%
C 25%
D 20%
E 25%

80. If the prevalence of dementia is to be reduced by 50%, by how many years should the onset of dementia need to be delayed?

A 2 years
B 5 years
C 7 years
D 10 years
E 15 years

81. Elimination of depression from the elderly population can lead to a reduction in the number of new cases over a period of 7 years. What is the mean reduction expected?

A 5%
B 7%
C 10%
D 12%
E 15%

82. With regard to problem behaviour in patients with learning disability, which of the following is correct?

A Common in females
B Mainly one type of problem behaviour found
C Prevalence of 10–15%
D Prevalent in 30- to 45-year age group
E Tendency to be short-lived

83. Which of the following statements about alcohol-related dementia is correct?

A Early onset is associated with a poor prognosis
B It accounts for 15% of the dementia population
C It occurs more in areas of high socioeconomic status
D It presents most commonly at the age of 40–50 years
E The prevalence of Wernicke's aphasia/Korsakoff's syndrome is on the decrease

84. Which one of the following is not a predictor of course and outcome in schizophrenia?

A Characteristics of the onset of the illness
B Features of initial clinical state and treatment response
C First rank symptoms at the baseline
D History of past psychotic episodes and treatment
E Premorbid personality and functioning

85. Which of the following statements about a cross-sectional study is correct?

A It is bias free
B It can explore multiple outcomes and exposures
C It is hard to design
D It is suitable for rare conditions
E It takes a long time to complete

86. Which of the following statements is a characteristic feature of a qualitative study?

A It is based on experiments
B It is based on a survey
C It is deductive
D It is useful to generate a hypothesis
E The sampling method used is statistical

87. The suicide rate has increased worldwide in the last 45 years. Which of the following reflects the increased rate?

A 20%
B 30%
C 40%
D 50%
E 60%

88. In which age group was the suicide rate highest by sex and age in the UK from 2000 to 2009?

A 15–44 years: males
B 15–44 years: females
C 45–74 years: females
D 45–74 years: males
E 75+ years: males/females

EPIDEMIOLOGY: MEASURES

89. What is the cross-sectional observation of the number of individuals with a disease in a specified population called?

A Incidence
B Life-time prevalence
C Prevalence
D Period prevalence
E Point prevalence

90. A disease under study has a high prevalence. What is the most likely possibility?

A High incidence, short duration of disease
B High incidence, long duration of disease
C Low incidence, short duration of disease
D Low incidence, long duration of disease
E Low incidence due to rare disease

91. What is the number of new cases of a disease over a period of time out of the total population at risk called?

A Cumulative incidence
B Incidence rate
C Incidence density
D Period prevalence
E Point prevalence

92. What does comparing observed deaths to expected deaths signify?

A Crude mortality rate
B Odds ratio

C Relative risk
D Specific mortality rate
E Standardised mortality ratio

93. Which of the following rating scales is a self-rating scale to measure symptom severity and change in a mental illness?

A Beck's depression inventory
B Brief psychiatric rating scale
C Clinical global improvement scale
D Hamilton's rating scale for depression
E Yale–Brown obsessive–compulsive scale (Y-BOCS)

94. Which of the following statements about the Y-BOCS is correct?

A It also measures anxiety
B It is a diagnostic tool
C It is useful to assess obsessions
D It is useful to monitor the response to treatment
E It is used only in research settings

95. What is the tendency of a rater to overestimate a patient's response based on prior assumptions called?

A Ceiling effect
B Central limit theorem
C Ecological fallacy
D Halo effect
E Hawthorne effect

96. What is the denominator in maternal mortality rate?

A 1000 live births
B 10,000 live births
C 100,000 live births
D All live births + still births
E All live births + still births + perinatal deaths

ADVANCED PSYCHOLOGICAL PROCESSES AND TREATMENTS: NEUROPSYCHOLOGY

97. Which of the following statements about memory is correct?

A Encoding is related to concepts of memory storage
B Long-term memory is also known as working memory
C Long-term memory has unlimited capacity
D Transfer of memory to long-term memory begins 30 minutes after information enters short-term memory
E Unless rehearsed, storage in short-term memory is limited to 30 seconds

98. Which of the following statements about neurocognition in schizophrenia is correct?

A Attention-processing speed is impaired more than the executive function domain
B Deterioration in IQ is more rapid after the first episode of schizophrenia than the subsequent episodes
C Deficits in motor skills are more pronounced than in the verbal memory domain

D Illness chronicity accounts for most cognitive impairments in schizophrenia
E Neurocognitive impairments usually begin after the first episode of schizophrenia

ADVANCED PSYCHOLOGICAL PROCESSES AND TREATMENTS: PERSONALITY AND PERSONALITY DISORDER

99. Which of the following statements about assessing the personality of an individual is correct?

A This involves giving short-term acquaintances questionnaires
B The Minnesota multiphasic personality inventory is a poorly researched inventory
C The best method is by observation made during an episode of illness
D The trait approach is considered to be the most reliable method of assessment
E The trait approach to personality assessment is the basis for the ICD-10 classification

100. A mother of a 7-year-old boy kept giving him laxatives in his food covertly and frequently took him to the hospital and insisted on his admission. Which of the following statements about this situation is correct?

A It is considered child maltreatment, according to definitions used by the government in England and Wales
B Personality disorder is commonly observed among the perpetrators
C The child won't be harmed because he is being cared for in hospital
D This is best considered a form of parental psychopathology
E This is exploitation of a vulnerable and defenceless child

ADVANCED PSYCHOLOGICAL PROCESSES AND TREATMENTS: DEVELOPMENTAL PSYCHOPATHOLOGY INCLUDING TEMPERAMENT

101. According to current evidence, which of the following statements about the development of puberty compared with previous generations is correct?

A Average age of menarche has reduced to below 11 years
B One in four girls reaches puberty before the age of 8 years
C One in ten 8-year-old boys has pubic hair
D Puberty lasts longer than in previous generations
E There is no change in the age of maturation of boys

102. According to the New York longitudinal study, what percentage of the cohort was identified as having an easy temperament?

A 10%
B 15%
C 20%
D 35%
E 40%

103. Which of the following statements about authoritarian parenting is correct?

A Children are popular and sociable
B Children have poor impulse control

C Non-negotiable parents who are strict
D Parents are willing to discuss with children
E Parents do not set limits

104. A girl was placed in a day care at the age of 6 months when her mother returned to part-time work of 24 hours a week. According to Bowlby, what is the most likely effect on her around her first birthday?

A Attachment is unaffected
B Child experiences maternal deprivation
C Object permanence does not develop
D Privation is not possible
E Child's response in strange situation test shows a disorganised attachment

105. The adult attachment interview is a tool used in research. Which of the following statements is correct about this tool?

A Five possible attachment styles can be identified
B It identifies attachment relationships during adulthood
C It is a semi-structured interview
D Studies use it in the context of intergenerational transfer of attachment patterns
E It is used mainly to identify the individual who might have been sexually abused as a child

106. Which of the following statements about object relations theory is correct?

A It includes the paranoid–depressive positions
B Only external object relations can be achieved
C The work was lead primarily by Sigmund Freud
D The paranoid–depressive positions are never fully resolved in adult life
E It uses defence mechanisms such as sexualisation and idealisation

107. Who described the 'good-enough mother'?

A Bowlby
B Freud
C Jung
D Klein
E Winnicott

ADVANCED PSYCHOLOGICAL PROCESSES AND TREATMENTS: THERAPY MODELS, METHODS, PROCESSES AND OUTCOMES

108. Which of the following statements about condensation in dream analysis is correct?

A Dream content substitutes the target of one's feelings onto another person or object
B It is also called dramatisation
C It makes sense of the manifest content
D It refers to what we dream about and are aware of on waking
E More than one dream idea is combined into a single mental image

109. Which of the following statements is about neurotic symptoms in psychoanalysis?

A They are considered by Freud to be the 'secret road to the unconscious'
B Dreams have different meanings from neurotic symptoms

C The symptoms may symbolise the wish with which they are linked
D The symptoms are often 'mental'
E The underlying cause is rarely 'physical'

110. Which of the following describes snags in cognitive–analytical therapy?

A Accurate description of autonomic procedures
B Appropriate roles or goals abandoned because they are perceived as forbidden or dangerous.
C Available action or possible roles limited to polarised alternatives
D Negative assumptions which generate acts that reinforce the assumptions
E Patient helped to recognise recurrences of unrevised patterns

111. A 32-year-old man was reprimanded by his boss, although he did not react at the time. When he went home, he shouted at his wife and slapped her after a minor argument. What is the likely defence mechanism?

A Denial
B Displacement
C Humour
D Reaction formation
E Sublimation

112. According to jungian psychoanalysis, which of the following statements refers to consciousness?

A It has four basic functions
B It is accessible through recall
C It includes archetypes
D It is made up of the individual's unique experiences involving repression
E It includes the mind's inherited characteristics that influence the reactions

113. In Yalom's universal therapeutic factors, catharsis refers to which of the following?

A Expression of affect in a supportive environment
B Filled with therapeutic optimism by seeing others improve
C Improving one's self-esteem by helping another
D Model helpful behaviours of other members
E Recognition of common experiences and that it reflects experiences in wider society

114. Which of the following statements best describes the technique of paradoxical injunction used in systemic family therapy?

A Different positions are assigned to parts of the family structure
B Members of the family are 'prescribed' their symptom which can paradoxically lead to an alteration
C Practical solutions are developed between family members
D Tasks are assigned to family members to complete between sessions, which involve a change in their actions to see how it affects the system
E Thought is given to how to live with symptoms if they cannot be altered

115. Which of the following therapies is the treatment of choice for anorexia nervosa in adolescents?

A Exposure response and reciprocal inhibition
B Eye-movement desensitisation and reprocessing
C Psychodynamic psychotherapy
D Systemic desensitisation
E Systemic family therapy

116. A 20-year-old woman recently diagnosed with moderate depression would prefer a psychological therapy rather than taking medication. Which of the following therapies should be recommended?

A Brief solution-focused therapy
B Cognitive–behavioural therapy (CBT)
C Psychodynamic interpersonal therapy
D Supportive counselling
E Systemic family therapy

117. A 26-year-old school teacher felt that she was responsible for every child in her class passing the examination, otherwise her colleagues would view her as a failure. Which of the following cognitive errors does she have?

A Assuming temporal causality
B Catastrophising
C Excessive responsibility
D Dichotomous thinking
E Over-generalising

118. Which of the following statements about dialectical behavioural therapy is correct?

A It can extend for a maximum of 6 months
B It was developed by Linehan
C It involves exploring childhood adversity with a therapist through free association
D It involves only group work
E The therapy is intensive with group and individual work

119. Which of the following is one of the stages of eye-movement desensitisation and reprocessing?

A Awareness
B Competing response
C Contingency management
D Habit reversal training
E Target assessment

ADVANCED PSYCHOLOGICAL PROCESSES AND TREATMENTS: TREATMENT ADHERENCE

120. Which of the following statements about the National Institute for Health and Care Excellence's guideline for a stepped care approach to generalised anxiety disorder is correct?

A Step 2 – identification and assessment
B Step 3 – low-intensity psychological interventions
C Step 3 – day hospital or inpatient care can be considered
D Step 4 – considered if there is high risk of self-harm
E Step 5 – CBT or drug treatment can be initiated

121. Which of the following statements about psychological treatments for people with an antisocial personality disorder (ASPD) is correct?

A Most of the psychological interventions delivered in the criminal justice system are largely based on concepts of conditioning
B Psychological interventions for almost all of the components of ASPD are well developed

C Roughly half of all interventions delivered in the criminal justice system are aimed at reducing offending behaviour
D There has been significant formal development of psychological interventions for ASPD
E There is a good research base for psychological management for comorbid disorders seen in ASPD

122. Which of the following statements about combined CBT and antidepressants is correct?

A After ending treatment, relapse rates of depression are similar in those treated with either CBT or antidepressants
B CBT is as effective as antidepressant medication in depressed inpatients
C Drug treatments have a higher relapse rate than CBT on discontinuation in generalised anxiety disorder
D The combination of CBT and antidepressant medication may be as effective as either alone in severe depression
E The combination of CBT and medication in mild-to-moderate depression is more effective than either alone

123. Which of the following treatments is harmful in post-traumatic stress disorder?

A Counselling
B Debriefing
C Drug treatment
D Trauma-focused CBT
E Eye-movement desensitisation and reprocessing

124. A 44-year-old woman complained of intense and irrational fears about eating in front of other people. Her therapist arranged a session at which she consumed a meal in front of four strangers. During the session, they looked at her but did not talk to her. However, she occasionally observed them whispering to each other. What type of therapy has been described?

A Assertiveness training
B Flooding
C Habit reversal
D Relaxation therapy
E Systemic desensitisation

125. Which of the following is an inclusion criterion for group therapy?

A Inability to tolerate group setting
B Motivation to change
C Problem areas incompatible with group goals
D Severe incompatibility with one or more group members
E Tendency to assume deviant role

126. A 20-year-old female college student repeatedly self-harmed, expressed feelings of being miserable, lonely and abandoned by family and friends. She found it difficult to maintain romantic relationships. Which of the following is the most appropriate psychological therapy for treatment?

A CBT
B Counselling
C Dialectical behavioural therapy
D Systemic desensitisation
E Systemic family therapy

ADVANCED PSYCHOLOGICAL PROCESSES AND TREATMENTS: PSYCHOSOCIAL INFLUENCES

127. Which of the following statements is consistent with emotional deprivation in children?

- **A** A child will show either clinging or detachment after short-term deprivation
- **B** After long-term deprivation children become self-sufficient through detachment
- **C** Long-term deprivation includes a child going to stay with grandparents, while the mother is on holiday
- **D** Short-term deprivation includes separation after a divorce
- **E** There are no long-term effects of short-term deprivation in children

128. Which of the following is a risk factor related to the parent/environment for child abuse?

- **A** Being abused as a child
- **B** Good socioeconomic status and high-powered job of parents
- **C** High self-esteem in parents
- **D** Older age of parents
- **E** Small family size

129. Which of the following statements about couples and divorce in the UK is correct?

- **A** About 60% of couples cohabit before they marry
- **B** After divorce, men have a lower rate of remarriage than women
- **C** Couples who cohabit before marriage are unlikely to divorce later
- **D** Divorce rates peak after 10–12 years of marriage
- **E** Divorce rates are highest in individuals in late 30s

130. Which of the following vulnerability factors in parents is considered in identifying children at risk of developing conduct problems?

- **A** All mothers are younger than 18 years
- **B** At least one of the parents is on social security benefits
- **C** At least one parent has a degree of contact with the criminal justice system
- **D** Parents have an education status below the GCSE level
- **E** Parents have other mental health problems

131. Which of the following statements about association between sexual abuse and psychiatric disorder is correct?

- **A** Girls are more prone to psychiatric disorders than boys after sexual abuse
- **B** A history of rape does not add any more to the risks of a psychiatric disorder if sexual abuse had already occurred
- **C** Patients are more prone to psychiatric disorders when they were abused before the age of 10 years compared with after the age of 15 years
- **D** There is enough evidence to show an association between sexual abuse and obsessive–compulsive disorder
- **E** There is a statistically significant association between sexual abuse and lifetime diagnosis of sleep disorders

Answers: MCQs

1. E Schwann cells

Neuroglial cells surround the neurons providing them with support and protection. They play a significant role in phagocytosis and myelin production. Neuroglial cells are of two main types known as microglia and macroglia. Microglia are specialised macrophages found in the central nervous system (CNS) whereas macroglia are found in both CNS and the peripheral nervous system (PNS). Schwann cell s, satellite cells and enteric glial cells are macroglia found in the PNS. Astrocytes, ependymal cells, oligodendrocytes and radial glial cells are macroglia found in the CNS. The most abundant type of macroglia in the PNS is the Schwann cells. However, overall, the most abundant type of macroglia is astrocytes.

2. E Oligodendroglioma

Intrinsic brain tumours include various grades of glioma, astrocytoma, oligodendroglioma, medulloblastoma, lymphoma and ependymoma. Oligodendroglioma is found in 10% of adults and 4% of children with primary brain tumour. The most common form of astrocytoma is gliobastoma multiforme. Extrinsic brain tumours include meningioma, neuroma, epidermoid tumour, glomus jugulare and chordoma.

3. B Cerebellum

Dentate nucleus is one of the four deep cerebellar nuclei that connect cerebellum to other regions of brain. It is phylogenetically the most recent and lateral nuclei. It is located in deep white matter. Other three deep cerebellar nuclei are called fastigial, globose and emboliform nuclei. The largest deep cerebellar nucleus is dentate nucleus and the smallest is an interposed nucleus which is a combined globose and emboliform nucleus.

4. A 5, 7

Astereognosia is associated with a lesion in the somatosensory association cortex that is located in Brodmann's areas 5 and 7. Loss of saccadic eye movement and impaired visual search is linked to lesions in the frontal eye fields (Brodmann's area 8) and dorsolateral prefrontal cortex (Brodmann's area 9). Impulsive behaviour and perseveration can be seen as a result of lesions in the dorsolateral prefrontal cortex (Brodmann's area 9) and anterior prefrontal cortex (Brodmann's area 10). Visual object agnosia is related to lesions in the secondary visual cortex (Brodmann's area 18), associative visual cortex (Brodmann's area 19) and inferior temporal gyrus (Brodmann's area 20). Auditory agnosia can occur as a result of lesions in the superior temporal gyrus (Brodmann's area 22) and primary auditory cortex (Brodmann's area 42).

5. C Alexia and agraphia

The lesion in area 6 is associated with agraphia without alexia and those in areas 7 and 40 are associated with Gerstmann's syndrome. Lesions 18 and 19 can cause alexia without agraphia. However, lesions 39 and 40, and the frontal lobe lesion can cause acalculia. The lesion in area 22 gives rise to Wernicke's aphasia.

6. C Parahippocampal gyrus is significantly smaller

Neuroimaging studies have found that parahippocampal gyrus is smaller in patients with schizophrenia compared with controls. Other structural changes noticed in schizophrenia include reduction in the brain mass, temporal lobe, cerebral volumes and overall brain length. There is ventricular enlargement, particularly involving the temporal horn. There is no significant difference in the hippocampal area.

7. C Perforation of the septum pellucidum

Punch-drunk syndrome, also known as boxer's dementia or dementia pugilistica, occurs in professional boxers who are subjected to repeated blows, resulting in concussions. It is a neurodegenerative disease in which individuals present with symptoms suggestive of dementia, parkinsonism, memory loss, and gait and speech problems. On macroscopic examination of the postmortem brain there is evidence of perforation of the septum pellucidum, cerebral atrophy, ventricular enlargement, thinning of the corpus callosum, brain tissue scarring and hydrocephalus. On microscopic examination there is evidence of neuronal loss, collections of senile plaques and neurofibrillary tangles.

8. E Temporal lobe

Macroscopic changes in Alzheimer's disease include global brain atrophy, ventricular brain enlargement and widening of the sulci. In this disease, atrophy is most significant in the frontal and temporal lobes of the brain. In Pick's disease, histopathological changes are noticed in cerebral cortex, basal ganglia, locus ceruleus and substantia nigra.

9. B Knife blade gyri

Pick's disease is a rare neurodegenerative disorder. In this disorder there is asymmetrical atrophy of the frontal and temporal lobes with sparing of the occipital and parietal lobes. The cerebral atrophy is so severe that some of the gyri are extremely thin, which is also known as knife blade gyri. In this disease, ventricles are enlarged. In Alzheimer's disease, there is global brain atrophy and sulcal widening.

10. A Generalised cerebral atrophy

Creutzfeldt–Jakob disease (CJD) is a fatal degenerative brain disease.

CJD is transmitted by infection with a prion, which is a protein in misfolded form. There are several types of CJD such as sporadic, variant, familial and iatrogenic types. In CJD there is selective cerebellar atrophy, generalised cerebral atrophy and ventricular enlargement. On histopathological examination there is a spongiform appearance to the brain tissue due to death of nerve cells. Neurofibrillary tangles, neuritic plaques and neuronal loss are histological changes found in dementia caused by Lewy bodies.

11. A Combined growth hormone-releasing hormone and somatostatins

Growth hormone is secreted by somatotrophic cells which are located within the anterior pituitary gland. It is under the stimulatory effect of growth hormone-releasing factor (GHRH or somatocrinin) and the inhibitory effect of somatostatins, both of which are released from neurosecretory cells in the hypothalamus. There are a number of other factors such as diet, age, gender, physical activity and stress that influence secretion of growth hormone.

12. C Glutamate receptors

The ion channels are classified into families on the basis of genetic sequence, homology and possibly pore lining α-sub unit type. The main families are transmembrane agents (6 TM, 4/8 TM, 2 TM), inotropic glutamate receptors, nicotinic-related receptors, intracellular calcium ion channels and chloride ion channels. Glutamate receptor is a ligand-gated ion channel. The sodium, potassium and calcium channels are ion-gated channels.

13. C 6 cm^2

International 10–20 system is a recognised system that describes the electrode placement on the scalp in an electroencephalogram (EEG) investigation. In this system, the scalp is divided into a grid that helps in compensating for the different head size in different patients. Each electrode records approximately 6 cm^2 of the cortical area.

14. E Variation in both the strength and the density of the current loops

Waveforms on an EEG can be monomorphic, polymorphic, sinusoidal or transient. The variations in both strength and density of the current loops lead to development of the characteristic sinusoidal waveform. Monomorphic activity is most likely to be sinusoidal waves. The cortical pyramidal neurons are arranged in radial columns and are directed outward. The membrane potential of the columns fluctuate, as a result of which an electric 'dipole' is generated. This dipole results in an electrical field potential as current flows through both extracellular and intercellular space. The waveform is generated by reciprocal excitatory and inhibitory interaction of neighbouring cortical cell columns. The extracellular component of the current is recorded in the EEG.

15. C Negative feedback on hypothalamus

Cortisol has a negative feedback effect on the hypothalamus, hippocampus and pituitary gland. It is a glucocorticoid steroid hormone that is secreted by zona fasciculata found in the adrenal cortex. It acts via glucocorticoid receptor types I and II. It is secreted in response to exposure to stress. Cortisol levels vary with diurnal changes. It is raised in serum just after awakening and is low in the evenings.

16. A Acetylcholine

A monoamine neurotransmitter can be both a neurotransmitter and a neuromodulator. Aromatic amino acids such as phenylalanince, tryptophan, thyroid hormones and tyrosine produce monoamine neurotransmitters. Dopamine, noradrenaline, adrenaline, serotonin, acetylcholine and histamine are the monoamine receptors. GHRH, glycine and glutamate are the amino acid receptors. Endorphins, cholecystokinin, angiotensin II, neurotensin and corticotrophin-releasing hormone are peptide neurotransmitters.

17. A D_1 increase adenylyl cyclase

The dopamine receptors are coupled to G-proteins. The main effectors of dopamine receptors are D1 which increases adenylyl cyclase, D2 which decreases adenylyl cyclase, D3 which decreases adenylyl cyclase, D4 which decreases adenylyl cyclase and D5 which increases adenylyl cyclase.

18. A Neurohormone

A neurohormone is a peptide secretion from neuroendocrine cells. It is released directly into the blood and reaches the systemic circulation, e.g. corticotrophin-releasing hormone.

A neurotransmitter is a substance found in and released from a neuron, which thereby transmits an impulse from one neuron to another neuron, e.g. acetylcholine.

A neuromodulator is a substance that originates from a postsynaptic site and either potentiates or inhibits neuronal transmission, e.g. steroid hormones.

A neuromediator is a postsynaptic substance that results in postsynaptic response, e.g. second messenger such as cAMP.

A neurotrophin is a protein substance, again from a postsynaptic site, but it maintains a presynaptic neuronal structure and induces the survival, development and function of neurons, e.g. nerve growth factor.

19. A Excitatory amino acid neurotransmitter

N-Methyl-D-aspartate (NMDA) is a type of glutamate receptor, and an excitatory amino acid neurotransmitter. Although glutamate activates both ligand-gated ion channels (ionotropic) and G-protein coupled receptors (metabotropic), NMDA is exclusively ionotropic. It has binding sites for glycine and phencyclidine. It has been hypothesised that schizophrenia results from the hypofunction of NMDA.

20. A Huntington's disease

Focal atrophy of the caudate nucleus is often seen on CT or MRI in Huntington's disease. As the illness progresses cerebral atrophy is noticed on neuroimaging. In MRI the characteristic areas of low signal are seen due to abnormal deposition of iron in the basal nuclei in Huntington's disease and Hallervorden–Spatz disease. Alcohol and illicit drug use can give rise to specific atrophy of the cerebellum.

21. C Multiple sclerosis

Neuroimaging, mainly MRI, is helpful in diagnosis and follow-up of patients with multiple sclerosis. It is the commonest cause of demyelination in the CNS and involves the brain's white matter. MRI will show evidence of plaques in well over 90% of the cases, although the location varies because it can affect practically any part of the brain. It is usually difficult to demonstrate white matter disease using CT or MRI. The demonstration of small foci of increased signal (T2-weighted images) is possibly due to demyelination but it could be a non-specific finding seen in a vascular and inflammatory condition such as Behçet's disease or sarcoidosis. In the leukodystrophies, the symmetrical involvement of white matter is usually a characteristic feature.

22. B MRI

A technique that is dependent on the blood oxygenation level is used in functional MRI (fMRI) to detect images that are based on cerebral blood flow and regional activity. When an area of the brain is functionally active due to a task, there is an initial decrease in oxygenated haemoglobin and an increase in deoxygenated haemoglobin and carbon dioxide. After few seconds (2–6 seconds) of neuronal activity, there is an increase in cerebral blood flow to this area of brain, leading to an increase in local oxygenated haemoglobin concentration. It is this level of change in oxygenated haemoglobin that is detected by fMRI. It therefore detects the functionally active brain regions.

23. B ^{14}N

Magnetic resonance spectroscopy (MRS) is used to measure metabolic changes in conditions such as stroke, brain tumours, Alzheimer's dementia and other neurological illnesses. It can also be used to measure metabolic changes in muscle by detecting intramyocellular lipid. MRS involves the use of different nuclei, which in a magnetic field absorbs and emits electromagnetic radiation. ^{14}N is used in the measurement of glutamate, urea and ammonia. ^{13}C and ^{17}O are used in the analysis of metabolite turnover rate. ^{23}Na is used for the study of intracellular sodium metabolism. ^{31}P is used in the analysis of bioenergetics, identification of unusual metabolites and measurement of pH.

24. A α_2-Receptor agonist

Opioids inhibit noradrenaline release, and discontinuation of opioids causes a rebound release of noradrenaline. Lofexidine, an α_2-adrenoceptor agonist, acts by reducing the noradrenergic storm that follows discontinuation of opioids. Stimulation of α_2-autoreceptors inhibits noradrenergic release. Therefore, it is indicated in treating opioid withdrawal.

25. A Buprenorphine

Mu (μ) receptors are opioid receptors. Buprenorphine is a partial μ agonist opioid, used for analgesia and treatment of opioid dependence. Bupropion is an antidepressant that acts as a noradrenaline and dopamine reuptake inhibitor antidepressant. Buspirone is an anxiolytic that acts as a 5-hydroxytryptamine 1A partial agonist. Butyrophenone is a class of antipsychotic drugs that includes benperidol and haloperidol. Busulphan is a chemotherapy agent.

26. D They are poorly ionised at physiological pH

Ionisation of drugs is largely dependent on the pH of the solution. It affects the absorption, distribution and elimination of drugs in the body. Antipsychotics are not highly ionised at physiological pH. In general, most psychotropic drugs are easily absorbed from the gut and they pass from the plasma to the brain due to their lipophilic property. Most of them are metabolised in the liver and are affected by first-pass metabolism. They are largely bound to proteins in the plasma, but only plasma-free fractions are pharmacologically active.

27. E Volume of distribution increases for lipid-soluble drugs

Total body water and lean body mass decrease in old age, whereas total body fat increases. This leads to an increase in volume of distribution (V_d) for lipid-soluble drugs but a decreased Vd for water-soluble drugs. Receptor sensitivity may increase in old age, leading to increased effects of the drugs. Due to delayed gastric emptying and slow motility, absorption is usually slowed down but just as complete. The albumin level decreases so the proportion of free or unbound drug increases. Half-lives are usually prolonged.

28. D Paliperidone

This is metabolised by the cytochrome P450 CYP450-2D6 into its active metabolite, paliperidone. Therefore, paliperidone itself is not a substrate for this enzyme. All the other antipsychotics mentioned in the question are metabolised by this enzyme. Therefore, in theory, their dose should be reduced when a CYP450-2D6 inhibitor (e.g. fluoxetine, paroxetine, duloxetine) is administered concomitantly. In the case of risperidone, it increases the risk of extrapyramidal side effects. Paliperidone injection is indicated for maintenance in patients with schizophrenia who had previously responded to risperidone or paliperidone tablets.

29. C It is highly insoluble in water

Carbamazepine is poorly soluble in water and most other liquids. Hence, it has been difficult to develop an intravenous formulation. However, recently a University of Minnesota group has developed intravenous carbamazepine using cyclodextrins. A study published in 2009 suggested that the intravenous formulation was safe, although it will be long before it is available for use in patients. Carbamazepine dissolves rapidly into the tissues with 70–80% plasma bound. It has a half-life of 26 hours (18–54 hours) after the first dose.

30. B Carbamazepine induces its own metabolism

Carbamazepine is an enzyme inducer and can induce its own metabolism. This is called autoinduction. The half-life of carbamazepine after a single dose is 26 hours (18–54 hours). After repeated use it can be decreased to 5–26 hours.

31. D Partial agonist on acetylcholine receptors

Varenicline is a partial agonist of nicotine acetylcholine receptor. It is used in people who wish to stop smoking. By its partial agonist activity on the $\alpha_4\beta_2$-subtype of nicotine receptor, it helps in reducing the craving and withdrawal symptoms of smoking. Furthermore, it can reduce the positive effects of smoking, thereby helping a smoker to quit.

32. B Alprazolam, clonazepam, lorazepam, midazolam, diazepam

Table 1.1 describes the equivalent dose of commonly used benzodiazepines. The lower the equivalent dose, the higher the potency of the drug.

Table 1.1 Dose equivalents (DEs) of benzodiazepines

Commonly used benzodiazepine drugs	Dose equivalents (lower the DE, higher the potency)
Alprazolam	0.25
Clonazepam	0.5
Lorazepam	1
Midazolam	0.25–1.7
Diazepam	5
Temazepam	5
Chlordiazepoxide	10
Oxazepam	15

33. B Duloxetine

CYP450-2D6 enzyme metabolises various antidepressants including tricyclic antidepressants (TCAs), duloxetine and selective serotonin reuptake inhibitors (SSRIs). It also converts venlafaxine into its active metabolite, desvenlafaxine. Paroxetine, duloxetine and fluoxetine are its potent inhibitors whereas other SSRIs, reboxetine and bupropion are among its weak inhibitors.

Concomitant administration of TCAs and SSRIs may require a dose reduction of TCAs. Concomitant administration of CYP450-2D6 inhibitors can also interfere with the analgesic effect of codeine.

34. C By inhibiting the enzyme phosphodiesterase V, it raises the levels of cGMP

Normally cyclic guanosine monophosphate (cGMP) causes smooth muscle relaxation, resulting in a physiological erection. The cGMP is broken down in the penis by phosphodiesterase-V enzyme. Sildenafil inhibits the enzyme, so helping the levels of cGMP to build up in the penis, leading to an erection. A desire to have sex is essential for sildenafil to work, meaning that it will not work during sleep.

35. B Non-selective binding to α-subunits of GABA-A receptors

There are three types of γ-aminobutyric acid (GABA) receptors: GABA-A, GABA-B and GABA-C. GABA-A receptors have different subtypes depending on the subunits: α (1–6), β (1–3), γ (1–3), δ, ε, π, Ω and ρ (1–3). Zopiclone, eszopiclone and benzodiazepines bind to α_1, α_2, α_3 and α_5 subunits of GABA-A receptors. Alpha-1 subtype is critical for sedation and is also linked to daytime sedation, anticonvulsant action and amnesia. Zaleplon and zolpidem are selective to the α_1-subtype and so have less risk of tolerance and dependence.

36. B Pharmacodynamic interaction

Pharmacodynamics is the study of the biochemical and physiological effects of the drug on the body. Pharmacodynamic interaction happens when drugs that have same or opposing action are given together. These drugs may alter the sensitivity or response of the body to the drugs. There are some reports of serotonin syndrome due to an interaction between mirtazapine and fluoxetine when co-administered.

37. A MARCKS is a protein kinase substrate

This is an abbreviation for myristoylated alanine-rich C kinase substrate (MARCKS) protein. Recent studies show that the mood-stabilising effect of mood stabilisers are attributed to the effect of medication on MARCKS. It has been noticed that with use of sodium valproate and lithium there is a significant down-regulation of MARCKS expression. Carbamazepine lacks this effect, indicating that the mechanism of mood stabilisation of carbamazepine is different to that of lithium or sodium valproate.

38. A Donepezil

This has a half-life of 70 hours. Galantamine has a half-life of 7–8 hours. Rivastigmine has a half-life of 1.5 hours. Tacrine has a half-life of 24–36 hours. Memantine has a half-life of 60–100 hours.

39. C Neutropenia

This is an idiosyncratic reaction that is difficult to predict. It is dose independent. About 2.7% of patients treated with clozapine develop neutropenia, whereas approximately 0.8% will develop agranulocytosis. Immune-mediated and direct cytotoxic effects can explain this side effect. The treatment for agranulocytosis is to stop clozapine. Another example of an idiosyncratic side effect of an antipsychotic medication is neuroleptic malignant syndrome.

40. A Anorexia nervosa

Normal limits for QTc are <440 ms for men and <470 ms for women. There is a strong evidence that a QTc interval >500 ms is associated with a risk of arrhythmia. Hypokalaemia, hypomagnesaemia, hypocalcaemia, long QT syndrome, bradycardia, ischaemic heart disease, myocarditis, myocardial infarction, left ventricular hypertrophy, extreme physical exertion, stress or shock, anorexia nervosa, extremes of age (children and elderly people) and female gender are risk factors for QTc prolongation and arrhythmia.

41. D Simpson–Angus scale

This patient has extrapyramidal side effects due to the use of a depot antipsychotic medication. The Simpson–Angus scale is widely used in clinical trials of antipsychotic drugs to assess extrapyramidal symptoms. It is relatively easy to administer in a clinical setting. The brief psychiatric rating scale is used to rate psychiatric symptoms rather than motor side effects. The Bush Francis scale is used to rate catatonic features. The Barnes' akathisia rating scale is used to assess akathisia. The unified Parkinson's disease rating scale is used to assess Parkinson's disease, not drug-induced parkinsonism.

42. D Mirtazapine

Depression is seen in about 30–40% of patients who survive a stroke. Mirtazapine, nortriptyline, fluoxetine, escitalopram and sertraline are recommended for prophylaxis. SSRIs, nortriptyline and mirtazapine are recommended to treat post-stroke depression. If a patient is prescribed warfarin, citalopram is the recommended SSRI due to fewer drug interactions. When using SSRI in an anticoagulated or aspirin-treated patient, use of a proton pump inhibitor should be considered for gastric protection.

43. C Pregabalin

All of the drugs mentioned are antiepileptic medication. Pregabalin is also licensed for the treatment of generalised anxiety disorder. In addition gabapentin and pregabalin are licensed for neuropathic pain and indicated in conditions such as fibromyalgia. Lamotrigine is also licensed for prophylaxis of bipolar depression. Vigabatrin and tiagabine are usually used as an adjunct treatment for epilepsy.

44. D Stop lithium and continue haloperidol

Lithium is best avoided in the first trimester because of its teratogenic potential. Antipsychotics (preferably first generation, but now evidence is building up for second-generation antipsychotics) should be used as mood stabilisers in pregnancy, if required. This patient is at high risk of relapse if the medications are stopped. There is no need to switch to chlorpromazine. Switching unnecessarily is associated with a risk of relapse.

45. B John Kane

Table 1.2 describes the contribution of key people in psychiatry.

Table 1.2 Famous people and their contribution to psychiatry

Name	Contribution
John Cade	Discovered mood-stabiliser effects of lithium carbonate
John Kane	In 1988, John Kane and colleagues conducted a double-blind study comparing the efficacy of chlorpromazine and clozapine/clozaril in treatment-resistant schizophrenia and established that clozapine was clearly superior to chlorpromazine
Jean Delay and Pierre Deniker	Established antipsychotic effect of the first antipsychotic, chlorpromazine, in the 1950s
Max Fink	Best known for his work on electroconvulsive therapy
Nancy Andreasen	Known figure in use of neuroimaging in the study of schizophrenia

46. D Its use with alcohol can cause hypotension

Alcohol is metabolised by alcohol dehydrogenase, which is further metabolised by aldehyde dehydrogenase. Disulfiram irreversibly inhibits aldehyde dehydrogenase, leading to accumulation of aldehyde in the system, producing symptoms such as flushing, nausea, vomiting and hypotension. It should be used after at least 24 hours of the last alcohol ingestion to avoid any possible disulfiram and alcohol reaction.

47. E Oxazepam

Longer-acting benzodiazepines are likely to be accumulated in the body if liver functions are impaired. It may lead to benzodiazepine toxicity. Therefore, shorter-acting benzodiazepines are preferred such as oxazepam (lorazepam). Diazepam and chlordiazepoxide are drugs of choice for detoxification in normal liver functions. Carbamazepine is used for alcohol detoxification in some countries, but in the presence of liver damage, its use is not recommended. Clonazepam is a longer-acting benzodiazepine.

48. E Telophase

Mitosis and meiosis are two forms of cell division that occur in eukaryotes. Many of the somatic cells go through cell division via the process of mitosis, which is a form of nuclear division. Meiosis is a special form of cell division for sexual reproduction. Mitosis consists of the following stages:

1. **Interphase:** before a cell enters into mitosis it goes into a growth period called interphase.
2. **Prophase:** it is a stage in which chromatin condenses into chromosomes.
3. **Metaphase:** it is a stage in which chromosomes get aligned on metaphase plate.
4. **Anaphase:** in this stage paired chromosomes separate and move to the opposite ends of the cell.
5. **Telophase:** it is in this stage that division of the cytoplasm begins.

49. C mRNA

Postmortem examination for gene expression studies are challenging due to problems with variability in intactness of RNA and biological variants. Intact RNA is essential for these studies to be carried out appropriately. Several studies have concluded that mRNA is stable in postmortem human brain and hence can be used for gene expression. Stability of RNA in postmortem tissue differs with the tissue type and also the tissue storage conditions.

50. E Twin adoption study

There has always been a debate about the role of nature and nurture in human development. Twin and adoption studies are the methods of choice for finding out relative contribution of both gene and environment on development. Adoption studies largely consider the impact of environment on the development of a child who has been adopted into a family. Heritability is described as what proportion of observed trait in individuals is due to genetic differences. It is mainly studied by conduction family and twin studies. A family study is conducted basically to answer the question: 'Is the phenotype familial?' Linkage analysis answers the question, 'Where the genes located?' Association analysis helps to find out, 'what the responsible genes are.'

51. D Transcription

It is the first step of gene expression in which information from the DNA molecule is transcribed onto an RNA transcript. This process takes place in the nucleus of the cell and consists of five steps: preinitiation, initiation, promoter clearance, elongation and termination. Translation is the process of making proteins from the RNA molecule and takes place in the cytoplasm with the help of ribosomes. Replication, as the name suggests, is a process in which the DNA or genetic material produces a duplicate copy of itself. Modification is a change in phenotype, which is influenced by environmental factors and is not a heritable trait.

52. B It is a ratio of genetic variance to phenotypic variance

Heritability is measured by concordance rate among twin pairs. It is ratio of genetic variance to phenotypic variance ($h_2 = V_g/V_p$), where h^2 is heritability and V_g is genetic variance and V_p is the phenotypic variance. A heritability of 1 will indicate that all the phenotypic variability is due to genetic variance. The proportion of proband twins who have an affected co-twin is called probandwise concordance rate and the proportion of twins where both are affected with the disorder is called pairwise concordance rate.

53. D Linkage analysis

Genetic linkage is described as investigating the co-segregation of the disease and a set of genetic markers while studying disease in families. The aim of linkage analysis is to determine the location of the gene(s) on a chromosome for a trait of interest, e.g. a common disease. A number of genetic disorders associated with intellectual disability are associated with chromosomal rearrangements such as Down's syndrome (trisomy 21), and the phenotype seems to arise because of the loss (e.g. monosomy) or addition (e.g. trisomy) of dosage-sensitive genes of unrelated functions. While studying population genetics, the term used to describe the non-random association of alleles at two or more loci, which might or might not be on the same chromosome, is called linkage disequilibrium. Genomic rearrangement is described as major changes in the size of the DNA from a few hundred base-pairs to megabases by processes such as deletion, insertion, translocation, duplication and other mutational changes. The gene dosage effect refers to the number of gene copies that are present in a cell or nucleus.

54. B Genetic association analysis

In linkage analysis, random DNA markers (consisting of DNA polymorphism) are used as proxies for any nearby risk genes. However, to determine if a particular or specific gene variant is directly affecting the risk for the disorder, or is very tightly linked to such a gene, the most appropriate method is genetic association analysis.

55. B Markers will not undergo recombination and will be inherited together

Genes that are tightly located near each other on a chromosome tend to be inherited together on meiosis during gene expression. These gene markers are inherited together without undergoing recombination and hence are termed 'genetically linked'. The logarithm of odds (LOD) score is a method used in linkage analysis to determine the frequency of recombination. The LOD score of –2 or less excludes linkage at that particular value of recombinant fraction and that a LOD of 3+ indicates 1000 to 1 odds that the linkage observed is not by chance.

56. A For association studies, the DNA marker has to be in the disease gene itself

Genetic association studies are used to find out if there is a correlation between a disease and genetic variation. It is used to identify the candidate gene that may have played a role in a particular disease. A DNA marker has to be in the disease gene itself or very tightly linked to it. In linkage analysis, linkage can be detected between the markers over large distances. The linkage analysis can be used to 'scan the genome'. Mutation analysis of polymorphisms is carried out by association analysis. It is popular in clinical and genetic counselling settings. There is documented evidence that there is an association between the human leukocyte antigen system and several diseases, such as type 1 diabetes mellitus and multiple sclerosis. The power of association is related directly to the quantitative trait locus (QTL) heritability, whereas the power of linkage is more closely related to the square of the QTL heritability.

57. B Most genes encode peptides and are transcribed by RNA polymerase 2

Expression of genetic information is unidirectional from DNA to RNA to polypeptides, and involves transcription which is in 5´-3´ orientation. Only one strand acts as a template called template/antisense strand, and the other strand as non-template/sense strand. In the process of transcription, three RNA polymerases (1, 2 and 3) including transcriptional factors are involved. RNA splicing, capping and polyadenylation are post-transcriptional. They occur in the nucleus and involve the mRNA. This is then followed by translation, wherein mRNA is transported from the nucleus into the cytoplasm and translation occurs in ribosomes by using tRNA. Messenger RNA has a codon and tRNA has anticodons that are complementary to each other. This leads to production of polypeptides. In most cases, the initiation codon is AUG; mRNA continues to be translated until a termination codon has been reached. There are many amino acids that need several codons for their expression whereas tryptophan and methionine are specified by a single codon. There is post-translational modification including methylation, phosphorylation and other.

58. B Fragile X syndrome

This syndrome is the second most common specific cause of learning disability after Down's syndrome, although it is the most common inherited cause for learning disability. It accounts for 10% of learning disability. It is usually of mild to moderate in severity. Its clinical features include enlarged testes, large ears, long face and flat feet. Gaze aversion is a striking feature in affected males. There is CGG trinucleotide repeat in the fragile X mental retardation-1 (*FMR1*) gene present at a fragile site at Xq27.3, and this is the cytogenetic marker. Around 1% of children with autistic disorder have fragile X syndrome and 30% of fragile X syndrome patients have autistic features.

59. B Respiratory perturbations

Perturbation or disturbance in respiration has been most convincingly linked to panic disorder in adults. It is shown to aggregate in families and increases familial risk of panic disorder. However, in children, respiratory perturbations are associated with separation anxiety disorder.

60. E Serotonin

One of the most robust findings in autism research has been an increased level of peripheral serotonin in a third of children with autism. Recent studies have identified a candidate gene for autism known as *CELF6*. Mutation in this gene is associated with a decrease in levels of serotonin and autism-like symptoms. Possible involvement of dopamine is indicated by the presence of stereotypy motions in autism.

61. D 60:40

In a landmark study by Kendler and colleagues on twins, the percentage ratio of direct:indirect effects of genetic liability to depression are 60:40 respectively. The direct effect is a result of the genes transmitted in the family, whereas the indirect effect is largely mediated by stressful events, neuroticism and a past history of depression.

62. B 35%

Numerous studies in family, twin and adopted children have identified the role of genetics and heritability in eating disorders. The concordance rate for anorexia nervosa is 55% in monozygotic twins and 5% in dizygotic twins. The concordance rates in bulimia nervosa for monozygotic and dizygotic twins are 35% and 30% respectively, suggesting that the genetic component is much more important in heritability of anorexia nervosa than bulimia nervosa.

63. E Penetrance

The probability of expression of an allele when present in the genotype is termed 'penetrance'. For example, if 5 out of 10 individuals with the allele express the respective trait, the trait is said to be 50% penetrant. Even when the allele is present, all phenotypes that are expressed will not be manifested to the fullest degree (penetrance 100%), which indicates that even when the allele is present its expression is variable. In medical genetics, it is a term used to describe the likelihood of the allele resulting in the disease. Depending on the degree of penetrance, it can be complete, highly penetrant, incomplete or low penetrant. Ascertainment is a sampling bias possibility in twin studies that can affect the outcomes. This bias can be overcome by using a population-based sample.

64. C Neuroticism

Suicidal behaviour can have a genetic predisposition and certain candidate endophenotypes can influence suicide risk. Some studies have suggested that this genetic predisposition to suicide risk may be independent of mental illness-related risk. Certain personality traits such as impulsivity, aggression and neuroticism are linked to suicide risk. The impulsive–aggressive continuum is related to serotoninergic dysfunction whereas neuroticism is related to γ-aminobutyric acid type A and serotonin dysfunction. Neuropsychological endophenotypes such as decision-making and executive functions also influence the risk of suicide. Changes in the amygdala and prefrontal cortex metabolism are other candidate endophenotypes related to suicide risk.

65. A Cerebrospinal fluid 5-hydroxyindoleacetic acid A levels

Changes in CSF 5-HIAA levels have been associated with impulsive suicide attempts. This indicates a central serotoninergic dysfunction that is due to a *TPH2* gene polymorphism.

66. C Low voltage alpha activity

Two kinds of EEG activities are used as endophenotypes in alcohol dependence. Low-voltage α activity has been noticed in healthy non-alcohol-dependent volunteers but who have a positive family history of alcohol dependence. β Waves have been noticed to be different in alcohol dependent patients compared with controls.

67. A Behavioural disturbances in childhood are associated with higher rates of alcoholism

Conduct disorder and behavioural disturbances in childhood lead to higher rates of alcoholism. Studies have shown that alcoholic males with a family history of alcoholism have a greater severity of alcoholism and poorer outcomes than those with a negative family history. Earlier age of onset, <15 years of age at first drink, is associated with increased rates of alcoholism and substance misuse. Children of alcoholic parents are likely to face poor parenting and are exposed to high-risk environments. They have poor performance in school and their occupation. The rates of familial alcoholism are high among poor socioeconomic categories.

68. D Chromosomal variations in chromosome 4 are strongly related to alcoholism

A study in Irish affected sibling pairs of alcohol dependence is a linkage study analysing the genetic aspects of alcohol misuse. The results of the study indicate a strong linkage for a number of alcohol dependence criteria to a broad region of chromosome 4. There was also weak linkage to several other regions including 1q44, 13q31 and 22q11, 2q37, 9q21, 9q34 and 18 p11 for alcohol dependence syndrome.

69. B Autism

Genetic predisposition relates to how high the risk of occurrence of a disease is in relatives. The strongest effect for genetic predisposition is seen in autism and attention deficit hyperactivity disorder (ADHD). It is approximately 50-fold in autism and ADHD, 10-fold in schizophrenia, and 5-fold in anxiety and unipolar depression. Heritability of bipolar affective disorder is 85%, schizophrenia 83% and unipolar depression in females and males 42% and 29%, respectively. The concordance rate for anorexia nervosa in monozygotic twins is 40% and in dizygotic twins 15%.

70. C CREB

CREB is an abbreviation for cAMP-response element-binding protein. It is a transcription factor implicated in wide range of psychiatric conditions. There are studies showing a strong link between CREB activities and alcohol- and substance-seeking behaviour. Regulation of CREB activity could be the mode of action of lithium as well as antidepressants.

71. E Individuals with the COMT gene *val*/*val* allele are at high risk of developing cannabis-induced psychosis

Allelic variation in the COMT gene is associated with an increased incidence of psychosis related to cannabis misuse. Individuals who had *val* allele were at high risk of developing psychosis compared with individuals who had the *met* allele. Cannabis misuse can cause psychosis in certain individuals and is irreversible in many. Dunedin studies have shown that individuals who give a history of psychotic experiences and use cannabis at age 11 years are associated with increased incidence of psychosis at age 26 years.

72. B The environmental factors that predispose as well as trigger psychiatric disorders

Anthony, Eaton and Henderson coined the term 'environment'. It refers to the totality of equivalent environmental influences and includes predisposing factors such as intrauterine exposure to radiation, teratogens, family income and neighbourhoods, as well as provoking environmental factors that can act as a trigger of psychiatric disorders, such as social stressors and crisis in personal relationships.

73. B Chromosome 22

Deletions on the end of chromosome 22 cause a wide range of physical as well as mental health abnormalities. This includes psychosis that is indistinguishable from schizophrenia.

74. A The ecological and social settings that an individual shares with parents

An ontogenetic niche, described by West and King, means that an organism shares not only genes but also the ecological and social environment with its parents. Nature (genes) and nurture (ecological and social setting) are both important in the overall development of an offspring. They work hand in hand. Sometimes, it is said that nature loads the gun and nurture fires it!

75. A Environmental factors play a more important role in the development of depression than genetic factors

When family studies into first-degree relatives conclude that there is increased incidence of illness in first-degree relatives, all it tells us is that the illness is familial. This could be due to genetic or shared environmental factors. If the study is extended to second- and third-degree relatives then it can provide significant information. If the findings show that there is increased risk of developing depression in parents, siblings and offspring as probands, whereas second- and third-degree relatives do not have the increased risk, this means that environmental factors play a more important role in the development of depression than genetic factors.

76. C 1 in 10

European study of epidemiology of mental disorders (ESEMED) is a multicentric study conducted in six European countries such as Belgium, France, Netherlands, Spain, Italy and Germany. This study is a part of WHO mental health survey initiative. According to ESEMED, the life time prevalence of mental disorders in Europe is 1 in 4 whereas the prevalence of mental disorder in the past 1 year (12-month prevalence) is 1 in 10.

77. B 2–4 years

The study of Zanarini et al. (2007) noted two main findings: out of the 24 symptoms studied over a 10-year period < 15% were exhibited; the other 12 symptoms declined less substantially with about 20–40% still exhibiting at the end of the 10-year period.

78. B 1–5%

The reported prevalence of elderly people in the community with paraphrenia is 0.1–4%. According to Targun and Abbott (1999), the prevalence is 0.2–4.7%. Hence, one can safely assume a prevalence of 1–5% as the right answer in this case.

79. B 10%

Approximately 10% of the elderly population admitted to a psychiatric ward have paraphrenia. Studies suggest that a wide range, from 10% to 63%, of the elderly population in nursing homes have psychotic symptoms.

80. B 5 years

If the onset of dementia is delayed by 5 years, the prevalence can be reduced by 50%. A delay of 6 months can also reduce prevalence by 6%. This delay can be achieved by successful risk reduction strategies.

81. C 10%

Ritchie et al (2010) concluded that elimination of depression from the elderly population can lead to a mean reduction of 10.3% in new cases of dementia over a period of 7 years. In addition, if depression and diabetes are eliminated from the elderly population and there is an increase in fruit and vegetable consumption, there can be a mean reduction of 20.7% in new cases of dementia. Of note is that depression was found to make the biggest contribution.

82. C Prevalence of 10–15%

Problem behaviours in patients with learning disability are commoner in males in the age group 15–34 years. The prevalence is about 10–15%. The prevalence increases with an increase in the severity of the learning difficulty. The problem behaviours tend to be of more than one type and include demanding behaviour, verbal and physical aggression, destructiveness and self-injury. These behaviours are usually long standing.

83. A Early onset is associated with poor prognosis

Alcohol is responsible for 10% of the dementia population. It may contribute to 21–24% of cognitive impairment in mid-adulthood. The frequency of alcohol-related dementia is higher in socioeconomically deprived areas and most of the cases present at age 50–60 years. The earlier the onset of alcohol-related dementia the poorer the prognosis. The prevalence of the Wernicke–Korsakoff syndrome due to thiamine deficiency is on the rise.

84. C First rank symptoms at the baseline

Possible predictors of course and outcome in schizophrenia are sociodemographic status, initial clinical state, treatment response, history of past psychotic episodes and treatment, premorbid

personality, functioning, type of the onset, family history of psychiatric disorders, variables of brain morphology and neurocognition. Good prognosis is indicated in acute onset, prominent affective features, no family history, paranoid subtype, good premorbid adjustment and older age of onset.

85. B It can explore multiple outcomes and exposures

Cross-sectional studies are simplest of all individual-level studies. They are cheaper and quicker than other studies and can explore multiple outcomes and exposures at the same time. They are used to quantify the prevalence of the disease in question. It allows for hypothesis generation based on the aetiology. It does have some limitations such as researcher and recall bias. It is not a feasible study design for rare diseases and does not establish a temporal association.

86. D It is useful to generate a hypothesis

A qualitative study helps in generating a hypothesis. This study is concerned with an individual's personal meanings, experiences, feelings, values and other types of opinions. Qualitative study uses passive observation, participant observation, in-depth interviews and focus groups. The sampling method used is theoretical and is analysed by inductive reasoning and validity.

87. E 60%

According to the WHO, suicide rates have increased by 60% in the last 45 years. The global mortality rate is 16 per 100,000 or one death every 40 seconds.

88. A 15–44 years; males

In the UK from 2000 to 2009, the suicide rate was found to be highest among males aged 15–44 years.

89. E Point prevalence

Prevalence and incidence are two measures of disease frequency.

Point prevalence is the number of individuals with the disease in a population at a particular point in time. It is expressed as a proportion. Period prevalence is the number of individuals with the disease in a population over a period of time. It is expressed as a rate. Life-time prevalence is the proportion of individuals who have or have had a given disease.

90. D Low incidence, long duration of illness

Prevalence is defined as a proportion of the product of the incidence rate and average duration of a disease.

Prevalence = Incidence × Duration of illness.

Hence, prevalence can be high even if incidence is low due to a long duration of illness.

91. A Cumulative incidence

Cumulative incidence or incidence risk is the number of new cases of a disease over a period of time out of the total population at risk.

Incidence density or incidence rate is the number of new cases of a disease over a period of time out of the total person-time of observation.

92. E Standardised mortality ratio

The number of deaths observed divided by number of expected deaths multiplied by 100 gives the standardised mortality rate (SMR). An SMR of 100 signifies that the standard population and population under study have the same mortality rate. If the 95% CI of SMR exceeds '1' it is considered statistically significant.

93. A Beck's depression inventory

Rating scales used in psychiatry can be self-administered, semi-structured or clinician administered. Beck's depression inventory and Zung's self-rating depression scale are self-administered. The brief psychiatric rating scale, clinical global improvement scale, hamilton's rating scale for depression, Yale–Brown–compulsive scale are all scales that are used for rating symptom severity and change in a mental illness. These scales are administered by clinicians.

94. D To monitor the response to treatment

The Yale–Brown obsessive compulsive scale (Y-BOCS) gives a measure of distress and not anxiety. It is not a diagnostic tool and is used only to assess the severity of the obsessive–compulsive disorder. It is this property of Y-BOCS that is made use of while monitoring the progress of the patient in response to the treatment. It is extensively used in clinical settings. There are 10 questions, 5 for obsessions and 5 for compulsion, and all are rated on a Likert scale with a minimum total score of 0 and a maximum of 40. A score of 0–7 is subclinical, 8–15 mild,16–23 moderate, 24–31 severe and 32–40 extreme.

95. D Halo effect

This effect is a cognitive bias in which there is a tendency to overestimate a response by a rater based on previous impressions, assumptions and judgements. It was termed 'halo effect' by psychologist Edward Thorndike. The Hawthorne effect is an effect whereby patients modify their behaviour just because they are participating in an experimental study. The ceiling effect is when the dependent measure puts an artificially low ceiling on how high a person may score; it can lead to an undesirable outcome. Ecological fallacy is an error of deduction that involves deriving conclusions about individuals just on the basis of an analysis of group data. Central limit theorem: as sample size increase, the sample mean will approach a normal distribution.

96. C 100,000 live births

The maternal mortality rate is the number of maternal deaths per 100,000 live births in the same time period. Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy. This does not take into account the duration and site of the pregnancy, any complication or its management. However, it does take accidents and incidental cause into account. Pregnancy-related death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death.

97. E Unless rehearsed, storage in short-term memory is limited to 30 seconds

Transfer of memory into long-term store begins immediately when information enters short-term store. Short-term memory is also known as 'primary' or 'working' memory whereas long-term memory is also known as secondary memory. Encoding is related to concepts of information processing and attention. Unless rehearsed, storage in short-term memory is limited to no more than 30 seconds, with a capacity of around seven units. Theoretically, long-term memory is permanent and has unlimited capacity.

98. E Neurocognitive impairments usually begin after first episode of schizophrenia

Neurocognitive impairments are reliably and broadly present in the first episode of schizophrenia. Larger IQ impairments are seen in the first episode compared with later stages. Patients with schizophrenia demonstrate cognitive impairments that range from mild to severe. These impairments are due to neither poor motivation nor the presence of psychotic symptoms. They usually remain stable over time and include deficits in perceptual skills, motor skills, verbal skills, selective attention, spatial and verbal working memory, verbal learning, non-verbal memory, procedural memory, long-term factual memory and executive functions. These impairments are central features of schizophrenia as suggested by their presence before the diagnosis is made.

99. E The trait approach to personality assessment is the basis for the ICD-10 classification.

The informants in personality assessments should have a good knowledge of the person for a number of years. The current assessments of personality, as well as the ICD-10 and DSM-IV classifications, are based on the measurement of traits although this method is of questionable reliability. There are objective and projective personality assessments. An example of an objective personality assessment is the Minnesota multiphasic personality inventory (MMPI). The most researched personality inventory is the MMPI.

100. B Personality disorder is commonly observed among the perpetrators

According to the WHO, there are five types of child maltreatments.

1. Physical abuse
2. Sexual abuse
3. Emotional abuse
4. Exploitation
5. Neglect.

The definitions used by the Government in England and Wales are similar to those used by the WHO, although there may be operational differences. Fabricated or induced illness is a form of child maltreatment more than parental psychopathology, although observations suggest high rates of personality disorder among the observers. The child is harmed directly or indirectly, leading to a variety of presentations.

101. D Puberty lasts longer than in the previous generations

The age of reaching puberty has decreased in the western population from 17 years to below 12–13 years. The average age of menarche in Britain is 12 years and 10 months. One in six girls reaches puberty before the age of 8 years and one in fourteen 8-year-old boys have pubic hair. Puberty starts earlier and lasts longer according to the children of the 1990s' study conducted by Bristol University's Institute of Child Health. It is noticed that boys also mature earlier.

102. E 40%

Thomas et al (1968) conducted a study of temperament in infants in the 1950s. Data was gathered initially by parental interviews that looked at nine traits that were combined to describe three temperament types.

Table 1.3 Types of temperament

Temperament	Percentage in cohort	Description
Easy	40	Playful, regular patterns of eating and sleeping, adapted easily to new situations
Difficult	10	Irritable with irregular eating and sleeping patterns. Responded negatively to new situations
Slow to warm	15	Relatively inactive and tends to withdraw from new situations

The remaining 35% of children could not be placed in any one group.

103. C Non-negotiable parents who are strict

There are three main parenting styles described. An authoritarian parenting style is where parents do not negotiate and are strict. The boundaries set are clear and rigid. The children tend to have low self-esteem and can be socially withdrawn. An authoritative parenting style is where parents discuss and explain to the child so that there are firm rules with shared decision-making. The children are usually sociable and popular and have a positive self-esteem. A permissive parenting style is where there are few limits set by the parents with no clear guidelines and the children usually have poor impulse control and display aggression.

104. B Child experiences maternal deprivation

According to Bowlby, if a child before the age of 1 year is separated from the mother when she is working, maternal deprivation is likely to occur. Rarely, privation, where no attachment is formed, may occur. Separation anxiety may develop. Object permanence development will not be affected. The strange situation test is an inappropriate test because the child may not respond when the mother returns as a sign of self-reliance rather than avoidance. This occurs because the child is used to separation.

105. D Studies use it in the context of intergenerational transfer of attachment patterns

The adult attachment interview is a structured interview that explores an individual's experience of attachment relationships in childhood. There are four possible attachment styles such as:

1. Secure/autonomous
2. Dismissive
3. Preoccupied/entangled
4. Unresolved/disorganised.

Studies mainly use it in the context of intergenerational transfer of attachment patterns or intergenerational continuity. In summary, people parent their children as they were parented.

106. D The paranoid–depressive positions are never fully resolved in adult life

The work with regard to paranoid and depressive positions was led primarily by Melanie Klein. In this case, an infant divides the caregiver into an external object that is all good or an internal object that is all bad. This includes two stages known as the depressive position and the paranoid–schizoid

position. Projection, splitting and projective identification are the primitive defence mechanisms observed in the paranoid–schizoid position.

107. E Winnicot

Winnicot proposed the following concepts:

- Holding environment indicates that, for appropriate development in a child, a parent needs to hold them physically and psychologically.
- Good-enough mother is a mother who needs to be responsive but not extreme, as in too responsive or unresponsive, to ensure adequate emotional development in the infant.
- Countertransference hate means that parents, like infants, can bring strong emotions to their care such as hate, which needs to be addressed.

108. E More than one dream idea is combined into a single mental image

A dream, according to Freud, is the fulfilment of a wish. Manifest content refers to what we are aware of upon waking. Dream interpretation is the process of making sense of the manifest content of dreams by 'translating' it. In dream work, the latent content, the 'underlying wish', is changed into manifest content and involves displacement, condensation and concrete representation. Displacement is the dream content that substitutes the target of one's feelings onto another person. Condensation is more than one dream's idea combined into a single mental image. Concrete representation is an abstract concept, revealed in a concrete way and is sometimes called dramatisation.

109. C The symptoms may symbolise the wish with which they are linked

Neurotic symptoms are viewed as similar to dreams. Dreams are considered to be the 'royal road to unconsciousness'. The symptoms are felt to be the expression of an unconscious and may symbolise the wish to which it is linked. The symptom is usually physical and the cause mental.

110. B Appropriate roles or goals are abandoned because they are perceived as forbidden or dangerous

Cognitive–analytical therapy was devised by Anthony Ryle for use in the UK National Health Service. Three different patterns of unrevisable, maladaptive procedures called traps, dilemmas and snags are described.

Traps are negative assumptions that generate acts which produce consequences that reinforce the assumptions. Dilemmas are brought about by the person acting as though the available actions or roles are limited to only polarised alternatives (false dichotomies). Snags occur when the appropriate roles or goals are abandoned because the individual makes an assumption that others would oppose, or because they are perceived as forbidden or dangerous.

111. B Displacement

Defence mechanisms are unconscious ways of dealing with experiences. Denial occurs when the individual does not acknowledge an aspect of reality. Displacement is shifting of the emotion from the real target onto a substitute. Humour is where comedy is used to manage the emotions that arise and express them. Reaction formation is where the individual expresses the opposite of what is felt or thought. In sublimation, an individual channels the emotions towards a socially positive substituted activity.

112. A It has four basic functions

According to Jung there are three levels that make up the psyche such as consciousness, personal unconscious and collective unconscious. The consciousness has four basic functions, namely thinking, feeling, sensing and intuiting. The personal unconscious which is made up of an individual's unique experiences involving repression is accessible through recall. The collective unconscious is where the mind has inherited characteristics that influence how one reacts and the type of experiences these will be. This includes archetypes that are representational images with symbolic meaning.

113. A Expression of affect in a supportive environment

According to Yalom the following are descriptions of the therapeutic process that occur in group work:

- Universality: where members recognise that the experiences are common and can link them to those that occur in society.
- Corrective recapitulation of the primary family experience: patients repeat childhood experiences in their family with the group, without their knowledge.
- Imitative behaviour: individuals improve their interactions in the group by modelling other's helpful behaviours of communication and listening.
- Interpersonal learning: gives feedback on how they are seen by others.
- Catharsis: when the individual feels unburdened difficult emotions, by expressing affect in a supportive environment.
- Group cohesiveness: members have a sense of being incorporated with others.
- Imparting of information: learning from others relating to their difficulties.
- Instillation of hope: seeing other members improve.
- Development of socialising techniques: members enhance their socialising skills through the supportive environment.
- Existential factors: encouraged to take responsibility for one's thoughts, feelings and actions.
- Self-understanding: develop a deeper understanding of the self with regard to their interactions with other members.
- Altruism: improving one's self-esteem as members learn that they can help each other.

114. B Members of the family are 'prescribed' their symptom which can paradoxically lead to an alteration

The following techniques are used in systemic family therapy:

- **In-session, structural interventions:** different positions are assigned to parts of the family structure.
- **Paradoxical injunction:** members of the family are 'prescribed' their symptom which can paradoxically lead to an alteration.
- **Reciprocity negotiation:** practical solutions are developed between family members.
- **Homework:** tasks are assigned to family members to complete between sessions; these involve a change in their actions to see how it affects the system.
- **Adjust to the symptom:** thought is given to how to live with symptoms if they cannot be altered.

115. E Systemic family therapy

This is the treatment of choice for adolescents with anorexia nervosa and is particularly effective with early onset anorexia. By the end of therapy, >50% reach a healthy weight'. 60–90% of patients with anorexia recover completely, with only 10–15% continuing to be seriously ill. It is included in the NICE guideline recommendations under psychological interventions.

The different systemic approaches developed include:

- Structural
- Strategic
- Milan systemic
- Narrative
- Psychoeducational
- Behavioural.

The structural approach looks at the family structure; it considers this as the family structure with generational hierarchies and semipermeable boundaries important for family function. Strategic systemic therapy is based on the hypothesis that behaviours that aim to suppress the symptoms in turn maintain it. The Milan systemic approach has changed over the years from the style of using paradoxical questioning to that of reflexive and circular questioning. The technique focuses on questioning various family members about their relationships. Narrative therapy involves helping families to create stories as a means of interpreting events. The psychoeducational approach combines behavioural and structural techniques. The behavioural approach uses techniques to maximise the positive and minimise the negative through goal setting, contingency contracting and operant conditioning.

116. B Cognitive–behavioural therapy

As recommended by the NICE guidelines, CBT is recommended as a psychological intervention in depression as well as for a variety of other presentations. There are randomised controlled trials to support its use. It is considered to be a short-term, problem-focused, psychosocial intervention and does not aim to achieve major personality change. It explores and works on the inter-relationship between one's thoughts, feelings, physiological reactions and behaviours.

There are three main areas of dysfunction identified in CBT such as conditional assumptions, negative automatic thoughts and core beliefs

117. C Excessive responsibility

In cognitive therapy, the cognitive errors derived from assumptions include the following:

- Assuming temporal causality: if it was true in the past then it will always be true
- Catastrophising: always think the worst and then it will happen
- Dichotomous thinking: things are viewed as extremes, either bad or good
- Excessive responsibility: assume personal responsibility for all negative outcomes
- Over-generalising: if it happens at one time then it will happen in all cases
- Selective abstraction: attention is given only to failure and negative outcomes
- Self-references: my bad performance is the centre of everyone's attention.

118. B It was developed by Linehan

Dialectic behavioural therapy (DBT) is an integrative therapy developed by Marsha Linehan. It is beneficial in individuals with borderline personality disorder. DBT involves group and individual interventions with social skills training, mindfulness and mediation. It is an intensive therapy with weekly and daily sessions that can extend up to 2 years.

119. E Target assessment

Eye movement desensitisation and reprocessing (EMDR) was developed by Francine Shapiro and is a treatment for post-traumatic stress disorder. There are several stages of EMDR. It begins with history and preparation. During target assessment, the target traumatic memory is explored and defined. Desensitisation is the therapist's directed evocation of the picture, which represents the memory image to desensitise. During installation, the patient is asked to recall the trauma and to

hold in mind the preferred positive, and is then treated with repeated sets of eye movements. The next stage is body scan which involves asking the patient to close the eyes and focus on bodily sensations. Finally there is closure and re-evaluation.

Habit reversal training is a behavioural treatment package useful in tics and other obsessive–compulsive spectrum disorders, trichotillomania, nail biting, etc. It has the following components: awareness training, competing response training, contingency management, relaxation training and generalisation training.

120. D Step 4–considered if there is high risk of self-harm

According to the NICE clinical guidance, the following steps should be considered as treatment of generalised anxiety disorder (GAD).

Step 1: it is for identification and assessment in all known and suspected cases of GAD.
Step 2: once diagnosed with GAD, if there is no improvement after education or watching in primary care, low level psychological therapy is considered.
Step 3: if step 2 has failed, a high level of psychological therapy such as CBT and applied relaxation is considered. In addition, medication is considered at this step.
Step 4: if there is high risk of self-harm, self-neglect, failed step 3 or complex GAD condition, then day hospital or inpatient stay can be considered in addition to medication and psychological therapy.

121. E There is a good research base for psychological management for comorbid disorders seen in ASPD

Most of the therapies, when used in the criminal justice system, aim to reduce offending behaviour. These therapies such as behavioural modification, graded exposure, problem-solving techniques and social skills training are largely based on social learning theory. Virtually all interventions delivered in the criminal justice system are aimed at reducing offending behaviour.

122. C Drug treatments have a higher relapse rate than CBT on discontinuation in generalised anxiety disorder

Most trials that have been done with the combination of CBT and medication in mild-to-moderate depression did not show that they were more effective than either alone. Stuart and Bowers (1995) showed, in an inpatient population, that the combination of CBT and antidepressants was more effective than medication alone in those with more severe depression. Evidence suggests that CBT is as effective as antidepressant medication in outpatient depression. The combination of CBT and antidepressant medication may be more effective than either alone in severe depression. After ending treatment, relapse rates of depression are lower with CBT than with antidepressants. Drug treatment has a higher relapse rate than CBT on discontinuation in anxiety.

123. B Debriefing

The National Institute for Health and Care Excellence (NICE) guidance does not recommend debriefing. There is some evidence that this can actually be more harmful. Rose et al (2009) found that psychological debriefing as a control or educational intervention can be worse or at the most equivalent in reducing severity or PTSD. It may even increase the risk of PTSD and depression. There is no evidence to support the routine use of debriefing in PTSD.

124. B Flooding

This occurs in vivo and is also known as implosion. The therapist exposes the patient to a controlled environment to evoke anxiety and no hierarchy is employed. Here the anxiety is generated but the patient is prevented from escaping.

125. B Motivation to change

Group therapy is a therapy in which carefully selected members guided by a therapist help one another to bring about personality change. Membership of a group uses the following inclusion criteria: motivation to change, ability to perform the group task, problem areas compatible with the goals of the group, compatibility with the group norms and ability to tolerate group setting.

126. C Dialectic behavioural therapy

In the NICE guidelines for borderline personality disorder, there is a recommendation to consider dialectic behavioural therapy for women with borderline personality disorder who repeatedly self-harm.

127. B After long-term deprivation children become self-sufficient through detachment

The long-term effect of short-term deprivation is separation anxiety which is also associated with long-term deprivation. Short-term deprivation includes admissions for mother or child into hospital for a period of < 3 months. Long-term deprivation follows death and more commonly these days divorce. The effects include detachment, clinging behaviour, oscillation between clinging and detachment, increased aggressive behaviour or psychosomatic reactions.

128. A Being abused as a child

Risk characteristics of parents who abuse children include being a single parent, young age, abused themselves as a child, low self-esteem, unrealistic expectations of the child's development, and inconsistent or punishment-oriented discipline. Risk factors of the environment for child abuse include social isolation, current stress and a large family.

129. A About 60% of couples cohabit before they marry

Couples who cohabit before marriage are less likely to be satisfied by their marriages. About 40% of couples who cohabit do not marry. Married people tend to live longer, are happier and healthier, and have lower rates of mental illnesses than divorced, single or widowed individuals. Divorce rates are highest in the first 5 years of life and then again after 15–25 years of being married. The highest divorce rate in individuals in England and Wales is for those in their late 20s.

130. E Parents have other mental health problems

The presence of the following vulnerability factors in parents can be useful in identifying children at risk of developing conduct problems:

- Parents with other mental health problems
- Parents with substance misuse and/or alcohol problem
- Mother younger than 18 years of age who has a history of being maltreated in childhood
- Parents who were in residential care
- Parents with history of involvement with criminal justice system, either past or present.

131. E There is a statistically significant association between sexual abuse and lifetime diagnosis of sleep disorders

In addition to sleep disorders, sexual abuse is also associated with several other mental disorders such as suicide attempts, depression, eating disorder, PTSD, emotionally unstable personality disorder and anxiety disorders. This association is independent of gender and the age when the abuse occurred. If there is a history of rape, it increases the association of sexual abuse, depression and eating disorder.