

(Key and Solutions for AIMCAT1713)

Key

SECTION – I
SUB-SECTION: RC

1. C	5. A	9. D	13. A	17. D	21. A
2. B	6. C	10. D	14. D	18. 35	22. C
3. A	7. C	11. A	15. C	19. A	23. D
4. D	8. D	12. B	16. A	20. B	24. B

SUB-SECTION: VA

1. 4	6. D	11. 54213
2. 35	7. A	12. C
3. 25	8. B	13. A
4. 4	9. 42513	14. A
5. C	10. 32514	

SECTION – II
SUB-SECTION: DI

1. D	7. A	13. A
2. B	8. C	14. 11
3. B	9. C	15. 14
4. A	10. D	16. 3
5. B	11. B	17. 15
6. A	12. D	

SUB-SECTION: LR

1. 5	7. B	13. C
2. 3	8. D	14. C
3. C	9. A	15. D
4. 4	10. B	16. A
5. A	11. D	17. B
6. C	12. A	

SECTION – III: QA

1. 8	9. C	17. C	25. 3	33. A
2. A	10. B	18. A	26. C	34. B
3. B	11. B	19. C	27. A	35. 9
4. D	12. C	20. C	28. C	36. 8
5. B	13. 1056	21. B	29. C	37. B
6. B	14. D	22. A	30. C	38. 1512
7. C	15. 56	23. B	31. A	
8. A	16. 35	24. B	32. B	

Solutions

SECTION – I
SUB-SECTION: RC

Solutions for questions 1 to 6:

Number of words and Explanatory notes for RC:

Number of words : 706

1. Option A: Refer to para 2. The raw milk used to make Emmenthaler cheese is partially skimmed It is Emmenthaler's pasteurized-milk imitators, such as Norwegian Jarlsberg and Wisconsin Alpine Lace, that have reduced the status of this fine cheese. From this, we can infer that Swiss Emmenthaler cheese is made out of raw or unpasteurized milk. Hence choice A is true and is not the answer.

Option B: Refer to para 5. Baby Swiss (made from whole milk) and Lacy Swiss (made from low fat milk) – have smaller holes than the original Emmenthaler cheese produced in Switzerland. Hence option B is true and is not the answer.

Option C: Choice C is incorrect. The flavour of the Swiss Emmenthaler cheese is attributed to the acetate and propionic acid released by the propionibacteria used in manufacturing the cheese. The carbon dioxide released contributes to the holes or "eyes" in the cheese. Hence choice C is the answer.

Option D: Refer to para 4. As the cheese ages, the bacteria continue to eat away at it. The more the cheese ages, the more pronounced is the flavour of the cheese and the bigger the bubbles get. Hence choice D is true and is not the answer.

The correct answer is choice C. Choice (C)

2. Option A: The last para tells us that Mr. Hans Bieri's farm perches at the upper reaches of the Emmenthal valley in Switzerland persevered in making Mozzarella cheese. But Emmenthal is famous for Emmenthaler, a particular type of cheese with holes in it. Emmenthal is not famous for Mozzarella cheese. So choice A is negated.

Option B: Refer to the last sentence of the passage.Their success turned tiny Schangnau, population 954, into the mozzarella capital of Switzerland, and mozzarella into the favorite Swiss cheese. Today, the lion's share of mozzarella consumed by the Swiss is made using cow's milk by big Swiss food distributors like Emmi; but Schangnau remains the boutonniere on the lapel.

Option C: We know from the penultimate para that water buffalo milk (And probably mozzarella cheese) was earlier associated with Naples. But choice C is not the specific answer for the question. So choice C is negated.

Option D: Neuchatel is another famous place for cheese made from cow's milk. So choice D is eliminated.

Choice (B)

3. Refer to para 5. Researchers say that the holes are also caused by hay particles that fall into milk-collecting buckets in barns. They also say that modern milking is very clean and eliminated debris such as hay dust, thereby playing a role in reduced hole size in Emmenthaler Swiss cheese. The researchers were able to alter the number of holes in Emmenthaler cheese by changing the amount of hay dust they added to milk. Hence we can infer that modern industrial milking methods that don't expose the milk to open barn environments can play a role in reducing the size of the holes in Emmenthaler cheese. This eliminates choices B and C and makes choice A correct. The passage has not mentioned that hay dust affects the flavour of the cheese. So choice D is incorrect.

Choice (A)

4. Schangnau which still depends on water buffalo milk for its cheese manufacturing process remains the boutonniere on the lapel.

Option A: From the context, it is clear that 'boutonniere' does not refer to a person. 'boutonniere' is used in reference to 'Schangnau'. So choice A is eliminated.

Option B: For the same reason as mentioned for choice A, choice B gets eliminated.

Option C: For the same reason as mentioned for choice A, choice C gets eliminated. Between option C and D, choice D is a better fit.

Option D: The word 'lapel' that follows 'boutonniere' in the last sentence of the last paragraph means an extension of a collar. 'boutonniere' refers to a flower or small bunch of flowers worn in a buttonhole. Hence choice D is correct.

Choice (D)

5. Option A: Choice A is the central idea of the last paragraph of the passage. Hence choice A is true.

Option B: Refer to the first sentence of the last paragraph persevered in getting the mozzarella cheese recipe borrowed from Italian mozzarella cheese makers right. The Italian recipe, borrowed by the Swiss, uses Buffalo milk, and the Swiss producer persevered in 'getting it right' ie. in replicating it as accurately as possible. So the converse of choice B is correct. Choice B is not the answer.

Option C: The first part of choice C is true of Emmenthaler cheese. Emmenthaler cheese is the typical pale yellow medium-hard cheese with a mild sweet, nutty taste. It is distinguished by large holes that are formed by pockets of gas during a fermentation Mozzarella cheese is the creamy white soft cheese, best made of water buffalo milk. So choice C is incorrect.

Option D: There is no data in the passage to infer choice D.

Choice (A)

6. Option A: Choice A distorts the facts given in the fourth para. *Propionibacterium shermani* consumes the lactic acid excreted by the other types of bacteria (*Streptococci*

and *Lactobacilli*) and, in turn, releases acetate, propionic acid and carbon dioxide. The carbon dioxide forms the bubbles that develop the "eyes".

Option B: The passage does not talk about high fat and protein content of the dairy cow's milk used in making the cheese. Coffee cream" is not a term used to describe the taste of any cheese in the passage. In another context, in the penultimate para, it is used to refer to the high fat content of the water buffalo's milk used in making Mozzarella cheese. So choice B is not specific to the question.

Option C: Choice C has been clearly stated in the first sentence of para 5. "newer cheese slicing equipment was tearing large-eyed Emmenthaler cheese apart. Hence choice C is the answer.

Option D: The first part of choice D is out of scope. The second part of choice D does not make any sense because we are not discussing the future of the cheese industry in Switzerland. Choice D is not the answer.

Choice (C)

Solutions for questions 7 to 9:

Number of words and Explanatory notes for RC:

Number of words : 413

7. Option A: Children should not only learn to read and write, they must also learn some family skills, the usage of which would make them independent and self-reliant. So education, according to Gandhiji, should also include teaching of family skills. "foreign languages" has not been mentioned. So choice A is not true.

Option B: True education, Gandhiji said, should help develop all three dimensions of the human personality viz body, mind and spirit in an integrated way. Hence choice B is incorrect.

Option C: Education and life for Gandhiji were co-extensive. Co-extensive means having the same limits, boundaries, or scope. Hence choice C is the answer.

Option D: Refer to the last sentence of the passage (..... true justice as fairness prevails, where there is no unnatural division between the 'haves' and the 'have-nots' and where everybody is assured of a living wage and the right to live and the right to freedom). All work is not equal and hence same pay is not fair. Also, in the third paragraph it has been mentioned that Gandhiji believed that basic education should be made compulsory for all children upto the age of fourteen. We cannot say that providing all children upto the age of 14 free education in similar schools would amount to an application of Gandhiji's idea of justice as fairness. Hence choice C is correct.

Choice (C)

8. Option A: Gandhiji has not advocated that free education be given to students. So we cannot say that choice A would weaken Gandhiji's argument.

Option B: Gandhiji said that basic education should be made compulsory for all children upto the age of fourteen and that Education should not end with childhood. Choice B does not weaken Gandhiji's argument.

Option C: The need for special training is not so much of an impediment in educating a person. The need can be fulfilled. The second half of choice C does not weaken Gandhiji's argument. Hence choice C is not the answer.

Option D: One of Gandhiji's argument as mentioned in the last paragraph is: The ultimate objective of education should be, Gandhiji said, to deliver **its unique function** of creating not only a balanced and harmonious individual but also a balanced and harmonious society where true justice as fairness prevails. So if creation of a equitable and compatible society is dependent on other extraneous factors besides congenial and balanced individuals, then it will weaken Gandhiji's argument.

Choice (D)

9. Gandhiji understood that engaging students on one level alone left them with an incomplete understanding of the course content. Traditional teacher-centered methods did not ensure a deep understanding of the content taught as

more learning was left to happen by chance than by a conscious effort geared towards it.

The third para says that Gandhi believed that good teaching involved engaging the students on four levels. If the current methods emphasized on only one level and did not induce students to draw parallels between course content and their personal lives, then it means that they isolate life from learning.

Option A: With respect to Gandhi's views on education, the third para does not comment on anything other than traditional teacher-centered methods and it also does not say that contemporary methods are more effective. So choice A is incorrect.

Option B: Nothing is mentioned in the third para about learning by rote. Choice B is out of scope.

Option C: The third para discusses Gandhiji's view on deep and lasting learning but has nothing to say about his view on intuitive learning. Gandhiji also does not pass any judgements regarding learning by serendipity and how it reflects on an instructor's skills. Gandhiji says that traditional teacher-centered methods leave deep learning (not just learning) more to serendipity than to conscious effort. Hence choice C is not the answer.

Option D: Choice D is correct. Since the third para mentions Gandhiji's view: "our teaching failed to move beyond the cognitive level", thereby leaving students with no understanding of the connections between what is learnt and what they experienced, this statement can be inferred.

Choice (D)

Solutions for questions 10 to 15:

Number of words and Explanatory notes for RC:

Number of words : 371

10. Today in the techno-societies there is an almost **ironclad consensus** about the future of freedom. The word "ironclad" means rigid, fixed or inflexible. They conjure up a dark vision of the future, in which people appear as mindless consumer-creatures, surrounded by **standardised** goods, educated in **standardised** schools, fed a diet of **standardised** mass culture, and forced to adopt **standardised** styles of life.

Option A: The passage nowhere mentions the role played by future dogmatic leaders. It only refers to the future choices that human will make. Even from the last sentence of para 2 (He will live, Ellul warns, in a totalitarian state run by a velvet-gloved Gestapo), we cannot say that a future dogmatic leader will draw conclusions. "Velvet-gloved" is an idiom used to describe a person who appears gentle, but is determined and inflexible underneath. 'Iron fist in a velvet glove' is the full form of the idiom. In any case, choice A does not refer to the meaning of the phrase "ironclad consensus".

Option B: For the same reason given in choice A, choice B can be eliminated.

Option C: The phrase "ironclad consensus" as it has been used in the passage points to a perception of standardization. But 'standardization' does not mean 'unchanging'. It could very well be standardisation where the very same changes apply to everyone, everywhere and at the same time. Hence choice C is not correct.

Option D: The idea behind the word 'standardisation', in this passage, is, essentially, that there will be an absence of choice. "Absence of choice" would imply a future that is common to all. So choice D provide the correct meaning of the phrase.

Choice (D)

11. Refer to the third para. This same theme-the loss of choice runs through much of the work of Arnold Toynbee. It is repeated by everyone from hippie gurus (*religious gurus*) to Supreme Court justices (*Legislative judges*), tabloid editorialists (*Journalists*) and existentialist philosophers (*Pro-Existentialists*).

The author of the passage does not subscribe to the said view in the question. Refer to the last paragraph. If instead of blindly accepting this syllogism, we stop to

analyse it, not only is the logic itself faulty, the entire idea is premised on sheer factual ignorance The last sentence of the last paragraph of the passage states the viewpoint of the author more precisely. Hence all would support the view that science and technology will deprive humans of choices except the author.

Choice (A)

12. In the passage, the author talks about human choice and the future of **human** choice. He refers to the theory of Vanishing Choice in the second para when he says: In the future, man will apparently be confined to the role of a recording device. Robbed of choice, he will be acted upon, not active.

Loss of choice happens because science and technology have fostered standardisation. In the future, man will progressively lose his freedom of choice.

Option A: "Diversity" is obviously the opposite of standardization. In choice A, the theory of Vanishing Choice cannot be applied. A human being can choose from a wide variety of kids' wear. This choice hints at "overchoice" mentioned in the last paragraph.

Option B: A robot's schedules of doctors in the out-patient department and the operation theatre of a hospital does not include human choice. So it is the best example. Choice B is the answer.

Option C: In choice C, one is not given a choice at all. People are forced to invest only in a public sector bank. The issue of Vanishing Choice does not arise.

Option D: Choice D offers one an array of choices. The problem of Vanishing Choice does not arise.

Choice (B)

13. Option A: "He will live, Ellul warns, in a totalitarian state run by a velvet-gloved Gestapo." Here Ellul is using the term 'totalitarian' to mean ruthless dictators. A totalitarian state is one that is run in an autocratic manner, and even if it were a group of autocrats, you'd call them dictators. Then, the term 'Gestapo' certainly points to ruthlessness, the velvet glove only means that the ruthlessness would not be obvious. Hence choice A is not true and is the answer.

Option B: "Such predictions have spawned a generation of future-haters and technophobes, as one might expect. One of the most extreme of these is a French religious mystic Jacques Ellul". Hence choice B is true and is not the answer.

Option C: According to Ellul, man was far freer in the past when 'Choice was a real possibility for him.' By contrast, today, 'The human being is no longer in any sense the agent of choice.' And, as for tomorrow: 'In the future, man will apparently be confined to the role of a recording device.' Man will be robbed of choice in the future. So choice C is true.

Option D: Jacques Ellul, whose books are enjoying a campus vogue. So choice D can be inferred to be true.

Choice (A)

14. Option A: Choice A is negated because there is no mention of the author being a technophobe. The passage does not state that the author is against science and technology. Refer to the third and fourth sentences in the passage. We can infer that the author may be in favour of democracy.

Option B: From the second para, from Jacques Ellul's comments, we can infer that man had more freedom to make choices in the past. We cannot say that Jacques Ellul believed that man made better choices in the past. Hence Choice B is incorrect.

Option C: Choice C is a passing detail given in the passage. But it is not the main contention of the author. The main argument of the author is that standardization due to the advancement of science and technology will deprive human beings of their freedom of choice.

Option D: The passage deals with an aspect of human freedom – the freedom of choice. The passage talks about the importance of the freedom of choice. So choice D is true.

Choice (D)

15. Option A: This is a prediction of Jacques Ellul and not the author's conclusion. Hence choice A is not correct.
 Option B: Choice B is not a conclusion of the author. It is a statement which signifies the importance of freedom of choice which has been further discussed in the passage.
 Option C: The main conclusion of the author is given in the last sentence of the last paragraph of the passage. The answer is: (Ironically, the people of the future may suffer not from an absence of choice, but from a paralysing surfeit of it; they may turn out to be victims of that peculiarly super-industrial dilemma: overchoice.) Hence choice C is the answer.
 Option D: The statement is integral to Jacques Ellul's argument presented in para 3 but is not the conclusion of the author.

Choice (C)

Solutions for questions 16 to 18:

Number of words and Explanatory notes for RC:

Number of words : 467

16. The mentioned book in the passage is also about the spiritual growth of Dan Phillips. In addition to relating his delight with temples, shadow puppets, water buffalo, chanting priests and clove plantations, Phillips also tells us how Bali helped him grow as an artist, especially as a member of a gamelan orchestra.

Option A: The author narrates (in third person) the sights and sounds of Bali and the town of Ubud (through the eyes of Dan Phillips) in a matter-of-fact way. He mentions a few positive benefits of the short tour of Bali (reinvigorate the second half of his life and found, not a hobby, but an entire culture), their lives were changed forever helped him grow as an artist, especially as a member of a gamelan orchestra. In the third paragraph, though the author highlights the lack of real culture and artistic fervour of the people of Ubud, he does this in a neutral or dispassionate way. His tone is more positive than negative. "Ubud can also turn up some stunning finds if you have the patience to browse through So the correct answer is choice A.

Option B: Choice B is incorrect as the passage follows a story telling format (account) rather than a description of emotions, feelings and images. The author does not express doubts about the positive impact of the tour of Bali on Dan Phillips' life. So "implied skepticism" as a response is incorrect. Choice B is not the answer.

Option C: The passage is more matter-of-fact than analytical. The author is not expressing any negative features or problems about Dan Phillips' tour of Bali. So "guarded appreciation" as a response is incorrect. Choice C is not the answer.

Option D: The author refrains from delivering an argument; neither does he try to convince people of an argument. Polemical means relating to a controversy, argument, or refutation. The passage is not argumentative in style. The author's tone is not polemical. Hence choice D is incorrect.

Choice (A)

17. Option A: Choice A cannot be inferred. "fell in awe of the customs and the rituals of Bali" and "short stay in Bali" as given in choice A are out of scope.

Option B: While it is true that "he came across chanting priests" and "he was a member of a gamelan orchestra" (as given in para 2), the remainder of choice B (..... chatted with priests in a gamelan orchestra about foreign influences in paintings etc) cannot be inferred. "Foreign influences in paintings" finds a reference in another part of the passage. The paintings also betray a mélange of foreign influences, with pseudo-Impressionism and faux-Expressionism finding particular favor among local daubers targeting the tourist dollar. So choice B is incorrect.

Option C: The first part of choice C is true. In the second para, it has been mentioned that he visited clove plantations (pastoral areas). But the second part of

choice C is not true. He owned a second home outside the village of Ubud. So choice C is incorrect.

Option D: In the passage, the author is mainly describing a marketplace for paintings and other decorative articles in Bali, which is Ubud. The author is also giving an idea of the place in order to get a fair deal for money. Therefore, there is an element of patience that is required for a person to get a fair deal for money in Ubud. Also "Ubud can turn up some **stunning finds** if you have the **patience** to browse through mountainous displays in the artisan shops" (as given in the last para), suggests that choice D is correct.

Choice (D)

18. Statement 1: Ubud is a hot and raucous place – and you're more likely to run into T-shirt hawkers than artists. But the passage does not give us a time comparison of the aspects/ features (or the change in features) of the place. So "**Nowadays**", T shirt hawkers are more prevalent in Bali than artists who "**earlier had a higher stature in society**" cannot be deduced. Statement 1 is incorrect.

Statement 2: "celebrate Christmas more than others in the world and are fond of Christmas decorations" in choice B is out of scope. "Christmas decoration" is only one item for sale that one can come across for in Bali. Statement 2 is not the reason for the question.

Statement 3: From the last sentence of the penultimate paragraph, Statement 3 is true.

Statement 4: "But before you picture a tranquil artists' community, where the reverent silence of masters at work is broken only by tropical birdsong and the lilt of a distant gamelan, let us put you straight." makes Statement 4 out of scope. Statement 4 cannot be the answer for the question.

Statement 5: Visitors are also often struck by the uneven quality and random subject matter of the work on display. Hence this choice will belie Bali's tag of cultural hub. Hence Statement 5 is correct.

Ans: (35)

Solutions for questions 19 to 24:

Number of words and Explanatory notes for RC:

Number of words : 702

19. Option A: The main concern of the author in the passage is to elaborate on the new strain of H5N1 discovered in Egypt, explain some research findings as to how the new strain has become predominant and to debate the possibility that it may have equipped the quality to jump from avians to humans. The last bit has been explained towards the end of the passage. Hence choice A is correct.

Option B: The passage is presented to us as a case study. Statistical evidence of deaths caused in humans is just a part of the passage. Hence choice B is not the primary concern of the author.

Option C: Choice C is incomplete and is not the main focus of the author.

Option D: Choice D is incomplete and is not the main focus of the author.

Choice (A)

20. Option A: Three other mutations in the strain are associated with increased binding to human-type flu virus receptors, but these mutations had been seen in earlier clade 2.2.1.2 viruses in Egypt. Choice A does not explain the difference between the predominant strain of H5N1 and the non-predominant strain of H5N1. Hence choice A is incorrect.

Option B: An analysis of the HA sequence revealed one amino-acid change, K373R, that appeared to be characteristic of the emerging strain, in that it had been seen only rarely in the past. The team also found four amino-acid changes in the new strain's NA gene. Three of these were at sites on the protein that induce B- or T-cell responses by the immune system. So choice B is true.

Option C: "Four amino acid changes in the HA sequence," as given in choice C is incorrect. There is only one amino acid change of interest in the case. Therefore choice C is not true.

Option D: The mutations spoken about in choice D are not exclusive to the new H5N1 strain. These mutations had been seen in earlier clade 2.2.1.2 viruses in Egypt.

Choice (B)

21. We can say that the new H5N1 virus has become predominant in Egypt. The older strain was also found in Egypt but it was not predominant i.e. there was no evidence or sign of it affecting human beings. After some time, the older strain was transformed into the newer strain (through mutation). the new viruses represent a distinct cluster that originated from previously circulating viruses of clade 2.2.1.2. This makes choice A true.

Option B: Choice B is not true. The difference between the predominant strain and the non-pre-dominant strain of the H5N1 virus cannot be really pinpointed in terms of detection in Egypt. But, both the pre-dominant strain and the non-predominant strain of the H5N1 virus have been observed in Egypt. Both of them belong to the same clade but different cluster. It has also been mentioned in para that none of the older viruses from that clade have been detected in Egypt **since last October**. This means that in the past the older viruses from the clade 2.2.1.1 were observed in Egypt.

Option C: We can say that the newer predominant virus is an upgraded or mutant version of the older non-predominant virus. But they don't belong to clade 2.2.1.1. The clade 2.2.1.1 has been mentioned in para 11 to tell us another story. A strain that was designated as clade 2.2.1.1 emerged in late 2007 and expanded in poultry, but then disappeared until the end of 2010. It did not replace 2.2.1.2 viruses, and it apparently caused only one human case.

Option D: Choice D is not a point of difference between the predominant strain and the non-predominant strain of the H5N1 virus. Like the non-predominant strain, the newer predominant virus is a part of the clade 2.2.1.2 **but** belongs to a **different cluster**. Also the second part of choice D is not entirely a point of difference. Refer to para 8: Three other mutations in the strain were associated with increased binding to human-type flu virus receptors, but these mutations had also been seen in earlier clade 2.2.1.2 viruses in Egypt.

Choice (A)

22. Option A: The authors comment that a new H5N1 cluster emerged in Egypt once before but did not become predominant. A strain that was designated as clade 2.2.1.1 emerged in late 2007 and expanded in poultry, but then disappeared until the end of 2010. It did not replace 2.2.1.2 viruses, and it apparently caused only one human case. Hence choice A is not correct.

Option B: Choice B is not true. Human H5N1 cases first occurred in Egypt in 2006, and a total of 204 confirmed cases were reported from 2006 through 2014, with a case-fatality rate of 35.8%, the researchers say. This year, the case total reached 116 as of March 21, with 36 deaths, or **more than half the count for the preceding 9 years**. Hence we cannot say that the H5N1 strain was predominant right from the start.

Option C: The H5N1 strain was present but not predominant but it has evolved and become more predominant after mutations. Hence choice C is true.

Option D: Choice D is not true as human deaths have been recorded.

Choice (C)

23. Option A: Choice A is not true. The author is making an analysis based on research findings by different scientists. The passage has an analytical style. Also the passage is reporting findings from medical journal *Eurosurveillance*.

Option B: A flu virus infects a cell by linking its hemagglutinin gene – the H in H5N1 – with chemical receptors on the surface of the cell, like a key fitting a lock. Hence Choice B is not true.

Option C: From the third paragraph, we can understand that biostatistical or demographic studies have been done. In the fourth para, it has been mentioned that the researchers sequenced the entire genomes of four isolates. Hence we can include the field of Genetics. Phylogenetic analysis, to see where the viruses fit on the H5N1 family tree, has also been mentioned in para 5. The field of Virology has also been included in the study. But we cannot say that the research findings belong to the field of ornithology (which is the study of birds). Hence Choice C is not correct.

Option D: From the seventh paragraph of the passage: The team found that two H5N1 viruses collected from infected humans last November "are part of the same expanding cluster," with similar mutation patterns. The two are the only publicly available sequences of viruses from recent human cases in Egypt. Hence Choice D can be understood.

Choice (D)

24. Statement (a): Refer to the last sentence of the passage. The findings don't prove that the new strain jumps to humans more easily, they add, but the possibility can't be ruled out. The words 'potential' and 'risk' in statement (a) make it clear that he's not talking of something that **will** happen, but something that **can** happen. Hence statement (a) is correct.

Statement (b): Statement (b) sounds very conclusive and does not gel with the speculative tone of the last sentence of the passage.

Statement (c): From the last sentence of the passage, statement c is true. "zoonotic potential" in statement (c) refers to the potential for animal infections to be transmissible to humans.

Statement (d): The first part of statement (d) is incorrect. Refer to the last paragraph. The observed recent rise in outbreaks in poultry **probably** resulted in increased exposure risks for humans in contact with poultry, which may have caused an increased incidence in human cases.

Choice (B)

Difficulty level wise summary - Section I	
Sub Section: RC	
Level of Difficulty	Questions
Very Easy	-
Easy	2, 4
Medium	1, 3, 5, 6, 7, 8, 11, 12, 13, 15, 16, 17, 18, 19, 20, 22
Difficult	9, 10, 14, 21, 23, 24
Very Difficult	-

SUB-SECTION: VA

Solutions for questions 1 to 4:

1. In sentence 1, the pronoun 'its' needs to be replaced with 'their'. 'their' refers to the plural 'Olympic games'.
In part 2, the verb 'finding' needs to be replaced with 'founding'.
In part 3, there is a need for the definite article 'the'. "playing fields" needs to be preceded by the definite article 'the'.
Part 4 has no errors.
In part 5, the preposition 'on' needs to be replaced with 'into'.
Ans: (4)

2. In part 1, there is an error of "incorrect comparisons". The part should read: between the government's budget and that of a household.

In part 2, there is an error of subject verb agreement. The plural noun 'households' needs a plural verb 'borrow'. The adverb 'exclusively' is misplaced. The part should read: households **borrow exclusively** from outside sources.

Part 3 has no errors.

In part 4, there are errors of punctuation. "thirteen strong" should be hyphenated. The part should read: Mr Trump's thirteen-strong team of economic advisers, announced on Friday,

Part 5 has no error. 'a background relevant to economics', in this context, means that their background is relevant to their roles as economic advisers. Also while we normally used 'packed with' for people and 'packed full of' for things or substances, it would be appropriate in this context if we mean that, to Trump, people are mere pawns.

Ans: (35)

3. In part 1, "Aegean Bronze Age civilization" needs to be preceded by the indefinite article "an".

Part 2 has no errors. 'Belongs in' has a valid use – when you identify something as in the right place or category.

In part 3, there is a sentence construction error. The correlative conjunction "both and" needs to be used. So "as well as" is incorrect and needs to be replaced with "and".

In part 4, the word "as" is redundant. The part should read: Historian Will Durant dubbed the Minoans "the first link in the European chain,"

Part 5 is error free.

Ans: (25)

4. In part 1, "straddle across" is incorrect. The correct usage is: three waterfalls that **straddle** the international border between Canada and the United States.

In part 2, there is an error of parallelism. The definite article 'the' needs to be repeated throughout. The sentence should read: From largest to smallest, the three waterfalls are **the** Horseshoe Falls, **the** American Falls and **the** Bridal Veil Falls.

In part 3, the adverb 'entirely' is misplaced. The part should read: and the American Falls **entirely** on the American side

Part 4 has no errors.

In part 5, the superlative form of the adjective 'high' is needed. The part should read: the combined falls form the **highest** flow rate of any waterfall in the world.

Ans: (4)

Solutions for questions 5 to 8:

5. The logical structure of the argument in the stimulus is that a yardstick applied in one circumstance is not being applied in another similar circumstance, thus rendering the rationale suspect. This structure is presented again in choice C. Choice A is inappropriate because it is not the rationale of the principle that it is being questioned, but the extent of belief in the principle. As a matter of fact, it's actually the difference between the principle being applied to someone else and the principle being applied to oneself. Choice B is inappropriate since 'most handwriting is difficult to read' provides for the possibility that the professor's handwriting is not so. Choice D is inappropriate since the two situations looked at are dissimilar.

Choice (C)

6. The claim of the author of the paragraph is that organic produce is more healthy and beneficial because it's more eco-friendly, less exposed to pesticides, and more often flavourful. Since the author has mentioned benefits of organic produce, any choice which negates those benefits will weaken the para. In this case, statement (d) which puts organic produce in a negative light (harmful bacteria and certain illegal pesticide residue levels) will weaken the claim for inclusion of organic produce. Statements (a) and (c) support the reason for inclusion of organic products in the diet. Statement (b) does not disprove the claim of the author. Statement (e) is incorrect because there are no monetary claims about organic produce in the paragraph. Hence choice D (Only statement d) is the answer.

Choice (D)

7. Maps have played a limited role in teaching efforts and textbooks in India, for some reason. The next sentence in the paragraph provides an example in support for the argument. Therefore option A is a valid inference as it states that it is possible to increase the usage of maps **in the sphere of education** in India. Choices B and C are speculative in nature and are beyond the scope of this paragraph. Choice D contradicts the first sentence of the paragraph.

Choice (A)

8. The premise is about the execution of the project, i.e. the carrying out of the plan – for this, the objective needs to be clear and the plan feasible. The argument does deal with the clarity of the objective, but with its appropriateness. Thus it does not relate to the premise. This flaw is indicated in choice B.

The author seems to be of the view that the original objective was 'venue for baseball' and the means to that objective was 'stadium project'. According to the para, the project continues (same means) though the objective is now 'venue for hockey' (different end) and the author is of the view that this is a needless objective, causing him to say that the stadium plan should be shelved. Seen this way, only choice B is correct. The main objective has changed (from baseball to hockey).

Option A: The first statement is that there needs to be a clear set of objectives (but this now exists – venue for hockey) supported by a feasible plan. But the author does not say that the new scheme does not fit this 'ideal', ie. the second part (feasible plan) is in place. Seen this way, choice A is wrong.

Option C: Choice C looks at the author's disapproval of the objective and not the nature of the flaw.

Option D: Choice D is easily ruled out as it is irrelevant.

Choice (B)

Solutions for questions 9 to 11:

9. On a careful reading of the sentences, it can be observed that sentence 4 is a general sentence that begins the paragraph. It states an important point that though animals have a system of communication, they are not capable of spoken language. Only humans are capable of spoken language. Sentence 4 is followed by sentence 2. "capable of spoken language" in sentence 4 is followed by "Effective spoken communication is essential" in sentence 2. Sentence 2 tells us the uses of spoken communication. Sentences 2 and 5 form a mandatory pair. "For humans in particular, spoken communication is also vital" in sentence 5 links with "Effective spoken communication is essential" in sentence 2. Sentence 5 is followed by sentence 1. Sentence 1 tells us about the evolution of mankind and our means of communication over the centuries. Sentences 1 and 3 form another mandatory pair. "**means** of communication have followed suit" in sentence 1 links with "endless variety of **ways** to express oneself" in sentence 3. Sentence 3 concludes the paragraph. Hence, 42513.

Ans: (42513)

10. On a careful reading of the sentences, it can be observed that sentence 3 is a general sentence that can begin the paragraph. It introduces the background of the narrative, mentioning the place Amsterdam and the painter. Sentence 2 follows sentence 3. It tells us more about the work of the painter. He had made one large canvas which is in the National Museum. Sentence 5 follows sentence 2. "second major work, a triptych of the war" in sentence 5 links with "one large canvas which is in the National Museum" in sentence 2. Sentence 5 (I went to see) is followed by sentence 1 (We spoke of war). Sentences 1 and 4 form another mandatory pair. "The huge canvases were white destroyed them that day" in sentence 4 links with "opened the door of his studio to let me go in first" in sentence 1. He had done a lot of work (which he had destroyed) though the world only knows that he had produced a few drawings and one large canvas, as mentioned earlier in sentence 2 (as far as the world knows). Hence 32514.

Ans: (32514)

11. On a careful reading of the sentences, it can be observed that sentence 5 is a general sentence that begins the paragraph. It introduces the Aristotelian tradition that pure thought and not 'observation' were required to work out all the laws that govern the universe. It can also be seen that all the remaining sentences have a reference to Galileo. Hence sentence 5 is best placed at the beginning of the paragraph. Sentences 5 and 4 form a

mandatory pair. "not necessary to check by observation" in sentence 5 links with "no one until Galileo Galilei bothered to see" in sentence 4. Sentences 4 and 2 form another mandatory pair. "Galileo Galilei saw whether bodies of different weight fall at different speeds" in sentence 4 links with "It is said that demonstrated that Aristotle's belief was false by dropping weights" in sentence 2. So, 542. Sentence 2 is followed by sentence 1. "It is said that Galileo leaning tower of Pisa" in sentence 2 links with "The story is untrue" in sentence 1. Sentence 3 concludes the paragraph. Sentence 3 (Galileo's measurements indicated that each ball) links with "he rolled balls of different weights" in sentence 1. So, 54213.

Ans: (54213)

Solutions for questions 12 to 14:

12. The author discusses the Bhagavad Gita as a source of inspiration for Indian managers. He says that the Bhagavad Gita is a wise and wonderful poem and explains how one should conduct one's life. He goes on to say that the text is too great to be treated as a source of inspiration for leadership and that doing so devalues the influence of the Bhagavad Gita. Choice C correctly summarizes the essence of the text. Choice B is incomplete as a summary and focuses on minor details. The first parts of choice A and choice D are correct but the second parts of choice A and choice D are incorrect. The author neither emphasizes nor denies the influence of the Bhagavad Gita. Choices A and D are also incomplete as summaries. Choice (C)
13. Though Choice A is wordy, it is a better summary than choice B. The para states an important point – "Do people know what their religious concepts are? This may seem an absurd question, but it is in fact an important question in the psychology of religion." Choice A does imply that there is a need to know, and this is not indicated in choice B. Further, the paragraph only speaks of 'conscious inspection'. So 'consciously aware' in choice A is correct. Choice B speaks of 'inspection' which would mean all examination – a distortion. Choice C is wrong because nowhere is it mentioned in the paragraph that one must know one's religious concepts to understand the psychology of religion. The first part of Choice D simply repeats a sentence from the paragraph. The second part of choice D changes the meaning – it implies that we have no objective knowledge of the workings of the brain, as opposed to the subjective type of knowledge implied in the paragraph. Choice D is also unnecessarily wordy. Choice (A)
14. It is not stated anywhere in the passage that knowledge systems cannot be learned. Also, the passage says musicians should communicate with each other if they want to build bridges, it does not say they have to adopt different musical genres. Hence, choice B can be negated. Choice C does not talk about the different training processes. Also, the passage uses the example of Western and Indian music to illustrate a point that different schools of training and instruments lead to a difference in the approach to music. This is not explained in Choice C. Choice D is correct but incomplete, as it does not talk about musicians finding a common ground to communicate with each other. Only choice A contains all the points, thus summing up the passage. Hence, choice A. Choice (A)

Difficulty level wise summary - Section I					
Sub Section: VA					
Level of Difficulty	Questions				
Very Easy	–				
Easy	6, 7				
Medium	8, 12, 13				
Difficult	1, 2, 3, 4, 5				
Very Difficult	9, 10, 11, 14				

SECTION – II

SUB-SECTION: DI

Solutions for questions 1 to 5:

1. The population decreased by more than 20% in 1953, 1969, 1976 and 1978, i.e., for 4 years. Choice (D)
2. By observing the graph, we can see that the percentage increase was the highest in 1982 (100%). Choice (B)
3. Number of years in which the population was 10 = 4
Number of years in which the population was 15 = 7
Number of years in which the population was 20 = 10
Number of years in which the population was 25 = 9
Number of years in which the population was 30 = 3
Number of years in which the population was 35 = 8 (including 1990)
Average
$$\frac{4 \times 10 + 7 \times 15 + 10 \times 20 + 9 \times 25 + 3 \times 30 + 8 \times 35}{41} = 22.93$$
 Choice (B)
4. $x = 20$
Required percentage = $\frac{20}{41} = 48.78\%$ Choice (A)
5. In 1950, there were 20 tortoises. However, 1978, the number of tortoises reduced to 10. Hence, only 10 tortoises would have survived for the entire duration. Choice (B)

Solutions for questions 6 to 9:

Since A has 7 points, it would have won two matches and drawn 1 match.
Since B has 3 points, it could have drawn three matches OR won one match.
Since C has 1 point, it would have drawn one match.
Since D has 6 points, it could have won 1 match and drawn three matches OR won two matches.
Since E has 12, points, it would have won all the 4 matches.
If E won all the three matches, each of the other teams must have lost at least one match. Hence, D could not have won 1 match and drawn 3 matches (since it cannot lose any more matches in this case). Therefore, D won 2 matches and lost 2 matches.
B would also have lost against E. If B drew 3 matches, it must have drawn against A, C and D. However, D did not draw any match. Hence, B must have won 1 match and lost 3 matches.
The only teams that drew a match are A and C. hence, they would have drawn the match against each other. Since A drew against C and lost to E, it must have won the two remaining matches. Now, D lost against A and E. Hence, it would have won against B and C. Since B won one match, it must have won the match against C.
The following table gives the result of each match (with the winner of each match inside each cell):

	A	B	C	D	E
A	X	A	Draw	A	E
B	A	X	B	D	E
C	Draw	B	X	D	E
D	A	D	D	X	E
E	E	E	E	E	X

6. Only one match was drawn. Choice (A)

7. A must have scored one goal each against B and D. hence, it would not have scored any goals against C. Therefore, C also would not have scored any goals against A (since the match was drawn).

Choice (A)

8. Only the statement given in option C is true.

Choice (C)

9. Three teams (B, C and D) lost at least two matches.

Choice (C)

Solutions for questions 10 to 13:

10. Divya must have applied to at least 8 colleges from A (since she was rejected from 8 colleges). In this case, the total number of colleges would be 26.67, i.e., 27. Similarly calculating for B, C and D, we find that the maximum is 27. However, if the number of colleges are to be integers, the minimum number of colleges must be a multiple of 20. Hence, the minimum number of colleges will be 40.

Choice (D)

11. Divya would have applied to 6 colleges in C. The total number of colleges that she would have applied to will be 40.

Choice (B)

12. Divya would have applied to 12 colleges in D. Hence, 8 colleges in D would have rejected her.

Choice (D)

13. If Divya was rejected from 12 colleges, she would have applied to 16 colleges in D. Number of colleges in C that she would have applied to will be 12. Required

$$\text{percentage} = \frac{10}{12} = 83.33\%. \quad \text{Choice (A)}$$

Solutions for questions 14 to 17:

Piyush attended for a total of $16.2 \times 5 = 81$ days. Hence, he would have attended for $81 - 11 - 17 - 22 - 19 = 12$ days in September.

In September, the total number of days that the students would have attended school would be $15.45 \times 20 = 309$.

Number of days attended in September by all the students except Amar = 295

Amar would have attended for $309 - 295 = 14$ days in September. In October, he would have attended for 15 days in October.

Similarly, Ramya would have attended for 21 days in October. Total number of days attended by all the students in October will be $17.2 \times 20 = 344$

Gaurav would have attended for 11 days in October. In June, he must have attended for 19 days in June. Krishna would have attended for 14 days in June and 23 days in July.

14. 11 students attended school for less than 15 days in September.

Ans: (11)

15. In June, Krishna attended school for 14 days.

Ans: (14)

Solutions for questions 5 to 8:

From (ii), Milk, Strawberries and Mangoes should be added one after the other. From (iv), none of these are the first ingredient. From (iii), Cream and Caramel also cannot be the first ingredient. From (i), only Sugar can be the first ingredient. The last ingredient cannot be Bread (from (i)). It also cannot be Cream or Caramel (from (iii) and (iv)). Hence, the last ingredient can only be Mangoes. Bread can be added immediately after Sugar or after Caramel. Hence, two cases are possible.

Case 1	Sugar	Cream	Caramel	Bread	Milk	Strawberries	Mangoes
Case 2	Sugar	Bread	Cream	Caramel	Milk	Strawberries	Mangoes

5. The first ingredient that must be added is Sugar.

Choice (A)

16. Students who attended for at least 20 days in July are Abhinav, Kamal, Krishna, Pavan and Wasim. Of these students, only Kamal, Krishna and Wasim attended school for more than 90 days.

Ans: (3)

17. Amar attended for 15 days in October.

Ans: (15)

Difficulty level wise summary - Section II	
Sub Section: DI	
Level of Difficulty	Questions
Very Easy	-
Easy	1, 2, 5, 6, 7, 8, 9, 11, 12, 13
Medium	3, 4, 10, 14, 15, 16, 17
Difficult	-
Very Difficult	-

SUB-SECTION: LR

Solutions for questions 1 to 4:

1. If he installs apps of the smallest sizes, he can install the maximum number of apps in his phone. If he installs Run Run, he must install Calendar. He can install Kart and Metube as the other two apps. This will add up to a total of 12 GB. He can install only one more app using the 4 GB remaining. Hence, Ravi can install a total of 5 apps in his phone.

Ans: (5)

2. If he installs Monument, he can install Postbox, Kart and Audiocloud.

If he installs Clash of the Villagers, he must install Amazin (from (iv)). The remaining 7 GB can be filled in only one way: Audiocloud and Postbox (since he cannot install Calendar).

If he installs Run Run, he has to install Calendar. The remaining space will be 11 GB. If he installs Kart, he will have a remaining space of 8 GB. This can be filled only if he installs Metube and Clash of Villages. But this will violate condition (iv). Hence, he cannot install Kart.

If he installs Amazin, he can install Metube and Postbox which will add up to a total of 16 GB. Hence, Ravi can install the apps in 3 ways.

Ans: (3)

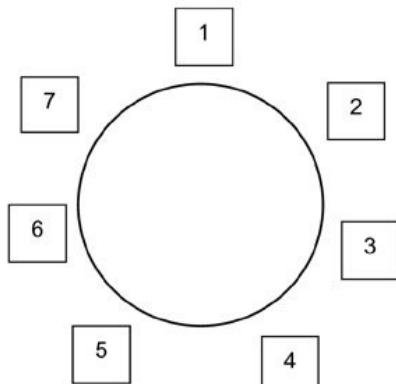
3. If Ravi installs Office in his phone, he has to install either Run Run and Calendar or Clash of Villagers. In either case, he cannot install two apps from the other two categories. Hence, Ravi cannot install Office in his phone.

Choice (C)

4. Ravi can install Run Run, Calendar, Kart and Metube. In this case, the remaining storage in his phone will be 4 GB. This is the maximum space that will be available in his phone.

Ans: (4)

Solutions for questions 9 to 12:



Let the adjacent diagram represent the positions of the ships. Given that the British ship was visible at 10:05 p.m. and the Indian ship was visible at 10:15 p.m. Let the British ship be at position 1. Since the light completed one full revolution in seven minutes, the British ship would have been visible at 10:12 p.m. Then the Indian ship has to be at position 4 (since it takes exactly one minute for the light from the lighthouse to move from one position to the next). Since the French ship was visible at 10:30 p.m., it has to be immediately to the left of the Indian ship at position 5 (since the Indian ship would have been visible at 10:15, 10:22 and 10:29). The German ship has to be at position 3, since it was visible at 10:56 p.m. From (iii), the American ship cannot be at 7 or 2. Hence, it can only be at 6. The Chinese ship has to be at 7 and the Japanese ship at 2.

9. The French ship was to the left of the Indian ship.
Choice (A)
10. At 11:00 p.m., the Chinese ship would have been visible.
Choice (B)
11. The German and Japanese ships were anchored adjacent to each other.
Choice (D)
12. The distance between British and French ships would be the highest.
Choice (A)

Solutions for questions 13 to 17:

Note on Logical Connectives:

Consider any two statement p and q.

- If the statement "**p AND q**" is true, then both p and q are true.
- If the statement "**p AND q**" is false, then at least one statement among p and q must be false.
- If the statement "**p OR q**" is true, then at least one statement among p and q must be true.
- If the statement "**p OR q**" is false, then both p and q are false.
- If the statement "**NEITHER p NOR q**" is true, then both p and q are false.
- If the statement "**NEITHER p NOR q**" is false, then at least one of the two statements must be true.

From (vii), Umesh must be a lawyer. From (i), either Rakesh or Wasim or both must be lawyers. Since Umesh is a lawyer, only one among Rakesh and Wasim can be a lawyer. From (iv), Rakesh must play Badminton and Wasim must play Football. From (vi), the lawyers must be playing the same sport. If Rakesh is the lawyer, Umesh and Rakesh must be playing Badminton. In this case, none of the doctors can play Badminton. This will make condition (ii) true. Hence, this is not possible.

If Wasim is the lawyer, Umesh and Wasim must play Football. Since Satish and Tarun cannot be engineers (from (iii)), Rakesh and Virat must be engineers. From (v), since Virat is an engineer, Tarun must play Hockey. Also, Tarun and Satish

must be Doctors. From (ii), Satish must play Badminton. Virat must play Hockey.

The following table provides this information:

Person	Profession	Sport
Rakesh	Engineer	Badminton
Satish	Doctor	Badminton
Tarun	Doctor	Hockey
Umesh	Lawyer	Football
Virat	Engineer	Hockey
Wasim	Lawyer	Football

13. Wasim is a lawyer.
Choice (C)
14. Rakesh and Virat are Engineers. Hence, the answer is option C.
Choice (C)
15. Except for the statement given in option D, the rest are true.
Choice (D)
16. Satish is the only person who plays Badminton and is not an Engineer.
Choice (A)
17. Rakesh plays Badminton.
Choice (B)

Difficulty level wise summary - Section II	
Sub Section: LR	
Level of Difficulty	Questions
Very Easy	-
Easy	1, 5, 6, 7, 8, 9, 10, 11, 12
Medium	2, 3, 4, 13, 14, 15, 16, 17
Difficult	-
Very Difficult	-

SECTION – III: QA

Solutions for questions 1 to 38:

1. $x^{2x} = (2x)^x$
 $\Rightarrow (x^2)^x = (2^x)^x$
 $\Rightarrow x^2 = 2^x$
 $\Rightarrow x = 0 \text{ or } 2$
 $\Rightarrow x = 2$
 $\therefore y = 2x = 4$
 $\therefore xy = 8$
Ans: (8)
2. Clearly, the ages of A, B and C are in A.P., with A being the middle term. The average of B, A and C will be equal to A itself. Hence A's age = 19 and B's age = 19 - 5 = 14.
Choice (A)
3. Let us suppose everyday Supandi crossed the bus at 7 a.m. at point A (say). On the specified day Supandi was late, he crossed the bust at 7:05 am at point B (say).

Supandi, being 15 minutes late, will reach point A at 7:15. Thus Supandi takes 10 minutes to go from B to A (7:00 to & 7:05).
The bus is on time and so it takes 5 minutes to go from A to B (7:00 to 7:05)
Thus the speed of the bus is twice that of Supandi.
Choice (B)
4. Let the cost prices of the items A and B be a and b respectively.
Their selling prices are 1.25a and 1.2b.

It is given that $\frac{1.25a}{1.2b} = \frac{2}{3}$
 $\Rightarrow \frac{a}{b} = \frac{16}{25}$
Choice (D)
5. Since $40^2 + 42^2 = 58^2$, it is a right angled triangle
Now area of the triangle = inradius \times semiperimeter

$$\frac{1}{2}(40)(42) = r \left(\frac{40 + 42 + 58}{2} \right)$$

$$\Rightarrow r = 12$$

Choice (B)

6. The five boys can be arranged amongst themselves in 5! i.e., 120 ways. Now among P, Q and R, there are 3! arrangements possible and each of these 6 possibilities are equally likely to occur.

1. P Q R
2. P R Q
3. Q P R
4. Q R P
5. R P Q
6. R Q P

Of these only the first case satisfies the criterion asked.

So $\frac{120}{6}$ i.e., 20 ways are there in which the given condition will be satisfied.

Alternative Solution:

If the order P, Q and R is fixed, then one of the remaining two (say S) can come in four possible places as shown below

___ P ___ Q ___ R ___.

The last person (T) can then be arranged in any of five possible places (similar to that above).

Hence, $4 \times 5 = 20$.

Choice (B)

$$7. \left[\frac{3^{252}}{11} \right] = 3^2 \left[\frac{\left(3^5 \right)^{50}}{11} \right] = 9 \left[\frac{(243)^{50}}{11} \right] = 9 \left[\frac{(242+1)^{50}}{11} \right] \\ = 9 \left[\frac{242K + 1^{50}}{11} \right] = 9 \left[\frac{1^{50}}{11} \right] = 9$$

Thus 3^{252} when divided by 11, will leave a remainder of 9.

Alternative solution 1:

By Fermat's Little Theorem

$$\text{Remainder} \left[\frac{a(p-1)k}{p} \right] = 1$$

$$\text{Rem} \frac{3^2 \times 3^{250}}{11} = \text{Rem} \left[\frac{3^2}{11} \right] \times \text{Rem} \left[\frac{3^{(11-1)25}}{11} \right] \\ = 9 \times 1 = 9$$

Alternative Solution 2:

It is easy to observe that the pattern of remainders for $3^1, 3^2, 3^3, 3^4, 3^5, \dots$ is 3, 9, 5, 4, 1, 3, 9, 5, 4, 1,

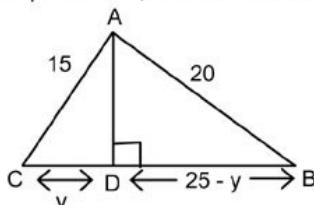
That is, it repeats with a period of 5.

Now, $3^{252} = 3^{5(50)+2}$

\therefore required remainder = remainder of 3^2 , when divided by 11, i.e., 9.

Choice (C)

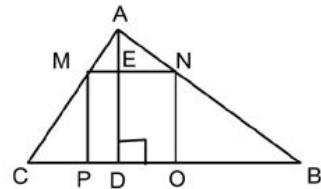
8. Let D be a point on BC, such that $AD \perp BC$.



Let $CD = y$

$$\text{Now } AD^2 = AC^2 - CD^2 = AB^2 - DB^2 \\ \Rightarrow 15^2 - y^2 = 20^2 - (25 - y)^2 \\ (25 - y)^2 - y^2 = 20^2 - 15^2 \\ (25 - 2y)(25) = 5(35) \\ 25 - 2y = 7 \\ \Rightarrow y = 9$$

$$\therefore AD = \sqrt{AC^2 + CD^2} = \sqrt{15^2 - 9^2} = 12$$



Let the measure of the side of the square be x .
Now, using similarity of triangles AMN and ACB,

$$\text{We have } \frac{AE}{AD} = \frac{MN}{CB} \\ \Rightarrow \frac{12-x}{12} = \frac{x}{25} \\ \Rightarrow 300 - 25x = 12x \\ \Rightarrow 37x = 300 \\ \Rightarrow x = \frac{300}{37} = 8\frac{4}{37}$$

Choice (A)

$$9. S_{100} = \frac{100}{2} [T_{23} + T_{78}] \\ = \frac{100}{2} \left[7\frac{11}{91} + 12\frac{80}{91} \right] \\ = 50[20] \\ = 1000$$

Choice (C)

10. The number of factors less than the square root of a number is always equal to the number of factors more than the square root of the number.

Let $P = N^2$

No. of factors less than $N = 11$

No. of factors more than $N = 11$

Again N itself is a factor of N^2

Therefore the total number of factors of N^2 is $11 + 11 + 1 = 23$

$\therefore N^2 = p^{22}$ where p is a prime number.

$\therefore P^2 = N^4 = p^{44}$

Number of factors of $P^2 = (44 + 1) = 45$

Choice (B)

11. A quadratic equations of the form $ax^2 + bx + c = 0$ with the roots being reciprocals of each other will have the product of its roots as 1, i.e., $\frac{c}{a} = 1$.

$$\text{In, } 11x^2 - (3m+5)x + (2m+3) = 0, \frac{c}{a} = \frac{2m+3}{11}$$

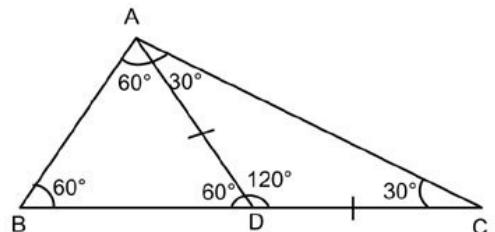
As the roots are reciprocals of each other.

$$\frac{2m+3}{11} = 1$$

$$\Rightarrow m = 4$$

Choice (B)

- 12.



As $\triangle ABD$ is an equilateral triangle each of its interior angles is 60°

$\therefore \angle ADC = 120^\circ$

Again, as $AD = DC$

$\angle DAC = \angle DCA = 30^\circ$

Therefore ABC is a right angled triangle right angled at A.

Choice (C)

13. We can start by either taking the husbands or the wives. Let us take the five husbands. First, the five husbands can be arranged in $(5 - 1)!$ ways. Now, there are five positions in between the husbands where the wives needs to be seated. Again, the wives needs to be seated in such a way such that no wife sits opposite her husband. This is similar to derangement of 5 letters and 5 envelopes where no letter goes to its corresponding envelope. It can be done in

$$\left[\frac{1}{0!} - \frac{1}{1!} + \frac{1}{2!} - \frac{1}{3!} + \frac{1}{4!} - \frac{1}{5!} \right] 5! = 44 \text{ ways.}$$

Therefore, the total number of ways = $(5 - 1)! (44)$
= 1056 ways.

Ans: (1056)

14. The median of the set 4, 15, 23, 42 and x will lie in the range [15, 23], depending on the value of x .

If $x \leq 15$, then the median is 15

If $15 < x < 23$, then the median is x

If $x \geq 23$, then the median is 23.

Now the mean of the given data set is

$$\frac{4 + 15 + 23 + 42 + x}{5} = \frac{84 + x}{5}$$

$$\text{Now } \frac{84 + x}{5} > 16$$

Let us consider that x lies between 15 and 23.

$$\text{Then } \frac{84 + x}{5} = x$$

$$\Rightarrow x = 21$$

If $x \geq 23$, the median is 23 and so the mean must also be 23.

i.e., Mean Median

$$\frac{84 + x}{5} = 23$$

$$\Rightarrow x = 31$$

Thus x can assume two values for which the given condition is satisfied, i.e., 21 or 31. Choice (D)

15. The common difference of prime numbers in AP can only be an even number.

The common difference of four prime numbers in AP cannot be 2 or 4 as one of the four numbers will then be divisible by 3.

For example if we take the prime nos as P, P + 2, P + 4, P + 6 or P, P + 4, P + 8, P + 12 where P can be of the form 3K, 3K + 1 or 3K + 2. we will not get all of them as prime numbers.

Now, if the common difference is 6, then we have

P	P+6	P+12	P+18
(1) 3K	3K+6	3K+12	3K+18
(2) 3K+1	3K+7	3K+13	3K+19
(3) 3K+2	3K+8	3K+14	3K+20

We observe that (1) is not possible.

The minimum value of a prime number of the form $3K + 1$ is 7 and substituting this we get the values as 7, 13, 19, 25 (not possible). The minimum value of a prime number of the form $3K + 2$ is 5 and substituting this we get the values as 5, 11, 17, 23. Thus the minimum sum is 56.

Ans: (56)

16. Exactly 1 + Exactly 2 + Exactly 3 = 120

Let the number of students playing exactly one sport be x

∴ The number of students playing at least two sports
= $3x$.

$$x + 3x = 120$$

$$\Rightarrow x = 30$$

$$\therefore \text{Ex2} + \text{Ex3} = 90 \quad (1)$$

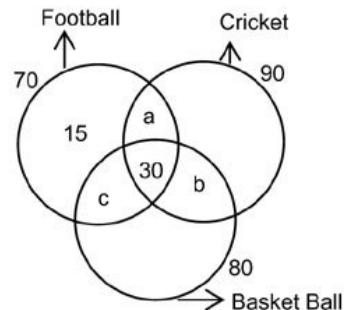
Now η (Football) + η (cricket) + η (Basket ball)

= Ex 1 + 2 (Ex 2) + 3 (Ex 3)

$$70 + 90 + 80 = 30 + 2 (\text{Ex 2}) + 3 (\text{Ex 3}).$$

$$2 (\text{Ex 2}) + 3 (\text{Ex 3}) = 210 \quad (2)$$

Solving (1) and (2), we get Ex 3 = 30 and Ex2 = 60



$$\therefore a + c = 70 - (30 + 15) = 25$$

$$\text{Again } a + b + c = 60$$

$$\Rightarrow b = 60 - 25 = 35$$

Ans: (35)

17. Let the principal and the rate of interest be denoted by P and $r\%$ per annum.

Now, it is given that,

$$P \left(1 + \frac{r}{100}\right)^{27} = 8P$$

$$\Rightarrow \left(1 + \frac{r}{100}\right)^{27} = 8$$

$$\Rightarrow \left(1 + \frac{r}{100}\right)^{9 \times 3} = 2^3$$

$$\Rightarrow \left(1 + \frac{r}{100}\right)^9 = 2$$

Raising both sides to the power of 4, we get

$$\left(1 + \frac{r}{100}\right)^{36} = 16$$

$$\therefore P \left(1 + \frac{r}{100}\right)^{36} = 16P$$

Therefore, it would become 16 times itself after another 9 years.

Alternative Solution:

Since $8 = 2^3$,

The sum must have doubled itself thrice over in 27 years, that is once every 9 years.

Hence, in another 9 years, the sum will double itself again and become $8 \times 2 = 16$ times itself.

Choice (C)

18. $f(x) = |x - 7n| + |x - 49n^2| + |x - 2401n^4|$

Now, $|x - 7n| + |x - 2401n^4|$ will be minimum when $7n \leq x \leq 2401n^4$

If $n < 7n$ or $n > 2401n^4$, $f(x)$ will increase.

Now, $|x - 7n| + |x - 2401n^4| + |x - 49n^2|$ will be minimum when $|x - 49n^2|$ is 0 i.e., at $x = 49n^2$.

Thus $f(x)$ takes a minimum value for exactly one value of x , i.e., at $x = 49n^2$. Choice (A)

19. The roots of the equations $x^2 + ax + b = 0$ are

$$\frac{-a + \sqrt{a^2 - 4b}}{2} \text{ and } \frac{-a - \sqrt{a^2 - 4b}}{2} \text{ respectively and}$$

their positive difference is $\sqrt{a^2 - 4b}$

Similarly, the positive difference between the roots of

$$x^2 - ax + b + 2 = 0 \text{ is } \sqrt{a^2 - 4(b+2)}$$

$$\text{It is given that, } \sqrt{a^2 - 4b} = 3\sqrt{a^2 - 4(b+2)}$$

Squaring both sides, we get,

$$a^2 - 4b = 9(a^2 - 4(b+2))$$

$$\Rightarrow 8a^2 - 32b - 72 = 0$$

$$\Rightarrow a^2 - 4b = 9 \quad \text{--- (1)}$$

$$\therefore f(x) = x^2 + ax + \frac{a^2 - 9}{4}$$

$$= \frac{4x^2 + 4ax + a^2 - 9}{4}$$

$$= \left(\frac{2x+a}{2}\right)^2 - \frac{9}{4}$$

As $\left(\frac{2x+a}{2}\right)^2 \geq 0$, thus the minimum value of $f(x)$ is

$$-\frac{9}{4}$$

Alternative Solution:

If α and β are the roots of a quadratic equation, then

$$|\alpha - \beta| = \sqrt{(\alpha + \beta)^2 - 4\alpha\beta}$$

Now, the two quadratic equations are $x^2 + ax + b = 0$ and $x^2 + ax + (b+2) = 0$

$$\therefore \sqrt{a^2 - 4b} = 3x \sqrt{a^2 - 4(b+2)}$$

$$\Rightarrow 4b - a^2 = -9 \quad \text{--- (1)}$$

Now, using the standard formula for the minimum value of a quadratic expression, we get the minimum value of

$$\text{the expression } x^2 + ax + b \text{ is } \left(\frac{4b - a^2}{4}\right).$$

$$\text{Using (1), we get } \frac{4b - a^2}{4} = -\frac{9}{4}. \quad \text{Choice (C)}$$

20. Between 4 pm and 6 pm, there are 120 minutes. If she called at x minutes to 6 pm, then it must have been $4x$ minutes past 4 pm.

$$\therefore 5x = 120$$

$x = 24$. She called at 5:36 pm.

Similarly if she hung up at y minutes to 7 pm, then it must have been $2y$ minutes past 5 pm.

$$\therefore 3y = 120$$

$y = 40$. She hung up at 6:20 pm.

They talked from 5:36 pm to 6:20 pm, i.e., 44 minutes.

Choice (C)

21. Let the radii of the cylinders A and B be r_1 and r_2 respectively whereas their heights be h_1 and h_2 respectively.

$$\text{It is given that, } \frac{2\pi r_1 h_1}{2\pi r_2 h_2} = \frac{2}{3}, \Rightarrow \frac{r_1 h_1}{r_2 h_2} = \frac{2}{3} \quad \text{--- (1)}$$

$$\frac{\pi r_1^2 h_1}{\pi r_2^2 h_2} = \frac{4}{5} \Rightarrow \frac{r_1^2 h_1}{r_2^2 h_2} = \frac{4}{5} \quad \text{--- (2)}$$

Now (1)² ÷ (2) gives

$$\frac{h_1}{h_2} = \frac{5}{9} \quad \text{Choice (B)}$$

22. Let the speed of A and B be v_a and v_b respectively and let the length of the track be ℓ

Let $v_a > v_b$.

Time taken by them to meet for the first time (in the same direction)

$$= \frac{\ell}{v_a - v_b} = 24 \Rightarrow \ell = 24(v_a - v_b)$$

Similarly, time taken to meet for the first time when travelling in opposite directions

$$= \frac{\ell}{v_a + v_b} = 8$$

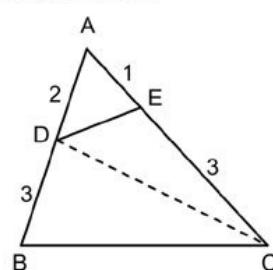
$$\Rightarrow \ell = 8(v_a + v_b)$$

$$\therefore 24(v_a - v_b) = 8(v_a + v_b)$$

$$16v_a = 32v_b$$

$v_a = 2v_b$
Therefore the speed of the faster person is twice the speed of the slower person.
Choice (A)

23. Consider the figure below.



Clearly, the area of $\triangle ADC = \frac{2}{2+3}$ of $\triangle ABC$ and

$$\Delta ADE = \frac{1}{1+3} \text{ of } \Delta ADC$$

$$\Rightarrow \Delta ADE = \frac{2}{5} \times \frac{1}{4} = \frac{1}{10}$$

$$\Rightarrow \text{Quadrilateral DECB} = \Delta ABC - \Delta ADE = \left(1 - \frac{1}{10}\right) \Delta ABC$$

$$= \frac{9}{10} \Delta ABC$$

$$\Rightarrow \Delta ABC = \frac{10}{9} \times 153 = 170.$$

Alternative Solution:

$$\text{Now, } \frac{AD}{DB} = \frac{2}{3} \therefore \frac{AD}{AB} = \frac{2}{5}$$

$$\frac{AE}{EC} = \frac{1}{3} \therefore \frac{AE}{AC} = \frac{1}{4}$$

$$\frac{\text{Area of } \triangle ADE}{\text{Area of } \triangle ABC} = \frac{\frac{1}{2}(AD)(AE)\sin A}{\frac{1}{2}(AB)(AC)\sin A} = \left(\frac{AD}{AB}\right) \left(\frac{AE}{AC}\right)$$

$$= \frac{2}{5} \times \frac{1}{4} = \frac{1}{10}$$

$$\therefore \text{Area of quadrilateral DECB} = \frac{9}{10} \text{ Area of } \triangle ABC$$

$$\text{Now, } \frac{9}{10} (\text{Area of } \triangle ABC) = 153$$

$$\therefore \text{Area of } \triangle ABC = 170$$

Choice (B)

24. Let the five-digit number be denoted by $abcde$

It is given that $2(b+d) = a + b + c + d + e$

$$\therefore b + d = a + c + e$$

$$\therefore (a + c + e) - (b + d) = 0$$

Thus the number is divisible by 11

Choice (B)

25. Denoting the day and month of birth of his sisters by D and M respectively, we get $3D + 5M = 100$.
 Substituting M = 1, we get $3D = 95$ (Not possible as M is a natural number)
 Next substituting M = 2, we get D = 30
 We know that consecutive values of M will change as per the coefficient of D and that of D will change as per the coefficient of M.
 Using this we get four possible values of M and D as follows:
- | | | | | |
|---|----|----|----|----|
| M | 2 | 5 | 8 | 11 |
| D | 30 | 25 | 20 | 15 |
- However, since February does not have 30 days, the number of sisters of Abdul can be at the most 3.

Ans: (3)

26. The line parallel to $2x + 3y = 6$, will be of the form $2x + 3y = k$.
 Since, the y-intercept of $2x + 3y = k$ is given as 5, the point (0, 5) lies on $2x + 3y = k$.
 Hence, $2(0) + 3(5) = k$, i.e., $k = 15$
 \therefore required equation is $2x + 3y = 15$

Choice (C)

27. As AE is the bisector of $\angle BAC$, $\frac{AB}{AC} = \frac{BE}{EC} = \frac{3}{5}$
 Again as AD is the median to side BC, $BD = DC$
 As $\frac{BE}{EC} = \frac{3}{5}$
 Let BE = $3k$ and EC = $5k$
 \therefore BC = $8k$
 Now BD = DC = $4k$
 \therefore ED = $BD - BE = 4k - 3k = k$
 $\frac{\text{area of } \triangle AED}{\text{area of } \triangle ABC} = \frac{ED}{BC}$
 (as they are triangle on the same base, with same vertex)
 $= \frac{k}{8k}$
 Therefore the area of $\triangle ABC$ is 8 times the area of $\triangle AED$.

Choice (A)

28. As the coefficient of x^2 is positive, so it is a minima function. Therefore $f(1)$ as well as $f(3)$ are positive.
 $f(1) = p - 3 > 0 \Rightarrow p > 3$
 $f(3) = p - 3 > 0 \Rightarrow p > 3$.
 Further, as the roots of $f(x) = 0$ are real and distinct the discriminant $16 - 4p > 0 \Rightarrow p < 4$. Thus the range of P is (3, 4)

Alternative Solution:

Since sum of roots = 4, the product of roots = $\alpha(4 - \alpha)$ will be minimum as α moves faster away from 2 (where $\alpha(4 - \alpha)$ attains a maximum of $2 \times (4 - 2) = 4$)
 But it is given that $1 < \alpha < 3$. Hence, the product (i.e., p) attains a minimum of $1 \times (4 - 1) = 3$, at $\alpha = 1$ (or 3).
 $\Rightarrow p > 3$
 Also, since discriminant is positive $p < 4$.
 Hence, $p \in (3, 4)$

Choice (C)

29. It is given that
 $x^2 + y^2 = 14xy$ _____ (1)
 Adding $2xy$ to both sides of eq (1), we get
 $x^2 + y^2 + 2xy = 16xy$
 $\Rightarrow (x + y)^2 = 16xy$
 Similarly, subtracting $2xy$ from both sides of eq (1), we get
 $x^2 + y^2 - 2xy = 12xy$
 $(x - y)^2 = 12xy$

$$\text{Now } \log \frac{x^4 + y^4 - 2x^2y^2}{192}$$

$$= \log \frac{(x^2 - y^2)^2}{192}$$

$$= \log \frac{[(x+y)(x-y)]^2}{192}$$

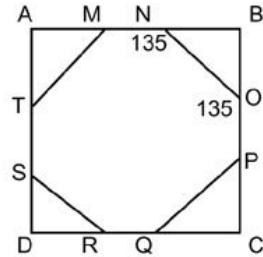
$$= \log \frac{(16xy)(12xy)}{192}$$

$$= \log(xy)^2$$

$$= 2[\log x + \log y]$$

Choice (C)

30.



Let ABCD be the square and MNOPQRST be the regular octagon. In a regular octagon, each interior angle

$$= \frac{180(8-2)}{8} = 135^\circ$$

$\therefore \angle BNO = \angle BON = 45^\circ$

Let us consider BN = BO = x

[$\because \triangle BNO$ is an isosceles triangle]

$$NO = \sqrt{BO^2 + BN^2} = x\sqrt{2}$$

Similarly $MN = x\sqrt{2}$ and $AM = x$

$$AB = AM + MN + BN = 2x + x\sqrt{2} = 4\sqrt{2}$$

$$\Rightarrow x(2 + \sqrt{2}) = 4\sqrt{2}$$

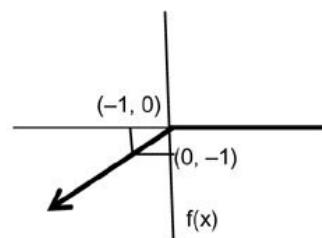
$$\therefore x = \frac{4\sqrt{2}}{(2+\sqrt{2})(2-\sqrt{2})} (2-\sqrt{2}) = 4\sqrt{2} - 4$$

$$\text{Perimeter of the regular octagon} = 8(x\sqrt{2})$$

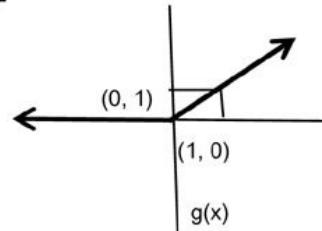
$$= 8(8 - 4\sqrt{2}) = 32(2 - \sqrt{2})$$

Choice (C)

31.



$$f(x) = \frac{1}{2}(x - |x|)$$

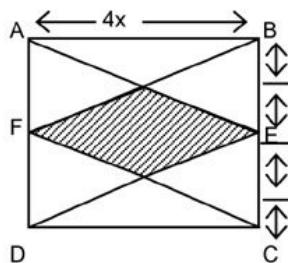


$$g(x) = \frac{1}{2}(x+|x|)$$

$$\therefore f(x) + g(x) = \frac{1}{2}(x-|x|) + \frac{1}{2}(x+|x|) = x$$

Choice (A)

32.



Let the side of the square be $4x$.

The area of the shaded region consists of two triangles,

each of whose area is $\frac{1}{2} (4x)x$

$$\frac{\text{Area of the shade region}}{\text{Area of the square}} = \frac{2 \left[\frac{1}{2} \times 4x \times x \right]}{(4x)(4x)} = \frac{1}{4}$$

Choice (B)

33. It is given that, $a \propto c d$

$\Rightarrow a = k_1 c d$, where k_1 is a constant

$$\text{Again } c \propto \frac{1}{b^2}$$

$$\Rightarrow c = \frac{k_2}{b^2}, \text{ where } k_2 \text{ is a constant}$$

$$\text{Again } d \propto \frac{1}{b^3} \Rightarrow d \propto b^3$$

$\Rightarrow d = k_3 b^3$, where k_3 is a constant

$$\therefore a = k_1 \left(\frac{k_2}{b^2} \right) (k_3 b^3)$$

$\Rightarrow a = k_1 k_2 k_3 b$ where (k_1) (k_2) (k_3) are constants

$\therefore a$ varies directly with b Choice (A)

34. The amount at the end of consecutive years as well as the compound interest for successive years form a GP series whose common ratio is $\left(1 + \frac{r}{100}\right)$

$$\text{It is given that } p \left(1 + \frac{r}{100}\right)^{10} = 1.44 \left[P \left(1 + \frac{r}{100}\right)^8\right]$$

$$\Rightarrow \left(1 + \frac{r}{100}\right)^2 = 1.44$$

$$\therefore \left(1 + \frac{r}{100}\right)^2 = \left(1 + \frac{20}{100}\right)^2$$

$$\Rightarrow r = 20\%$$

Therefore the compound interest for the 7th year will be 20% more than the compound interest for the 6th year.

\therefore The compound interest for the 6th year is $16\frac{2}{3}\%$ less than the compound interest for the 7th year.

Choice (B)

35. AM $(a, b, c) \geq$ HM (a, b, c)

$$\frac{a+b+c}{3} \geq \frac{3}{\frac{1}{a} + \frac{1}{b} + \frac{1}{c}}$$

$$(a+b+c) \left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c} \right) \geq 9$$

Therefore the minimum value is 9.

Alternative Solution:

$$\text{Assuming } a = b = c = 1 \text{ we get } \frac{(1+1+1)(1+1+1)}{1.1.1} = 9.$$

Taking any other set of values for a, b, c gives a value greater than 9.
Ans: (9)

36. Let the height of the room be h ft.

$$\begin{aligned} \text{Lateral surface area of the room} &= 2h(l+b) \\ &= 2h(15+12) \\ &= 54h \end{aligned}$$

The cost of painting the four walls = $(54h) (25)$

It is given that $(54h) (25) = 10800$

$$\Rightarrow h = 8 \text{ ft.}$$

Ans: (8)

37. A is the first letter and must be followed by a consonant. We arrange the consonants in $3!$ or 6 ways.

(say A M _ C _ T _)

Next in the three positions shown, we can arrange the remaining two vowels in $3C_2 \times 2!$ ways. Therefore the total number of arrangements is $3! \times 6 = 36$.

Choice (B)

38. Let the number be of the form $a b c d$.

Now, the thousands place i.e., a can be 2 or 3 or 4 or 5 or 6 or 7. Whereas the units place can be 1 or 3 or 5 or 7 or 9.

We have two cases:

Case I Thousands place is even

3 ways — — — 5 ways

The remaining two places can be filled in 8×7 ways.

\therefore Total number of ways = $3 \times 5 \times 8 \times 7 = 840$

Case II Thousands place is odd

— 3 ways — — — 4 ways

The remaining two places can be filled in 8×7 ways.

Total number of ways = $3 \times 4 \times 8 \times 7 = 672$ ways.

\therefore The total number of such four digit numbers = $840 + 672 = 1512$

Ans: (1512)

Difficulty level wise summary - Section III: QA	
Level of Difficulty	Questions
Very Easy	2, 12
Easy	1, 4, 7, 9, 11, 14, 17, 21, 22, 24, 26, 32, 33, 36, 37
Medium	3, 5, 6, 10, 15, 16, 18, 20, 23, 25, 27, 29, 30, 31, 34, 35, 38
Difficult	8, 28
Very Difficult	13, 19