T.I.M.E.
Triumphant Institute of Management Education Pvt. Ltd.

(Key and Solutions for AIMCAT1808)

Key

SECTION – I

1. 4153	9. A	17. D	25. B	33. 5
2. 2415	10. C	18. C	26. C	34. 3
3. 5432	11. 159	19. B	27. C	35. C
4. 3521	12. 347	20. A	28. D	36. B
5. C	13. 267	21. 11212	29. A	37. D
6. B	14. 369	22. 12121	30. B	38. B
7. D	15. D	23. 21211	31. 4	39. D
8. D	16. B	24. 11221	32. 2	40. C

SECTION – II

1. C	9. 2	17. C	25. D	33. B
2. D	10. 4	18. A	26. B	34. A
3. B	11. D	19. D	27. D	35. C
4. A	12. C	20. D	28. C	36. 12
5. C	13. A	21. B	29. B	37. 4
6. 4	14. B	22. D	30. C	38. 3
7. 3	15. B	23. A	31. B	39. 5
8. D	16. B	24. B	32. D	40. 4

SECTION – III

1. 126	9. C	17. C	25. D	33. A
2. 461	10. B	18. A	26. D	34. B
3. D	11. C	19. C	27. C	35. B
4. 1	12. D	20. A	28. A	36. C
5. B	13. B	21. B	29. B	37. 59
6. B	14. C	22. D	30. 12	38. 33
7. C	15. C	23. 12	31. B	39. 63
8. A	16. B	24. D	32. A	40. 5

Solutions

SECTION – I

Solutions for questions 1 to 4:

1. On a careful reading of the sentences, it can be observed that sentence 4 is a general sentence that begins the para. It introduces the term: brain dominance theory – and the background: A great deal of research has been conducted for decades. Sentence 4 (A great deal of research) is followed by sentence 1 (The findings indicate). Also "each hemisphere of the brain tends to specialize" in sentence 1 links with "brain dominance theory" given in sentence 4. Sentence 5 begins to explain the differences and features of "each hemisphere of the brain ..." given in sentence 1. "the left hemisphere ..... the right hemisphere" in sentence 5 points to "each hemisphere of the brain" in sentence 1. "more logical, verbal one ..... more intuitive, creative one" in sentence 5 is parallel to "preside over different functions and process different kinds of information" in sentence 1. Sentence 3 concludes the para in the same vein. So, 4153. Sentence 3 progresses much further to talk about getting from one brain environment to the next (left to right hemisphere or vice versa). It can come much further in the flow.
Note: It must be kept in mind that the word 'essentially' is used to mean 'basically, fundamentally, importantly' and not (as is often mistakenly done) 'in sum, to sum up'.
Ans: (4153)

2. On a careful reading of the sentences, it can be observed that sentence 2 is a general sentence that begins the para. It introduces the background: we must anticipate change. Sentence 4 follows with the contrast conjunction 'however'. "notion that one's personal future can be anticipated flies in the face of persistent folk prejudice" contrasts "we must anticipate change" given in sentence 2. Sentence 1 follows sentence 4 as it gives a reason for the point of view mentioned in sentence 4. "The belief that the future is a blank" in sentence 1 links with "one's personal future cannot be anticipated" as expressed in sentence 4. Sentence 5 with the contrast conjunction 'yet' concludes the para. "we can assign probabilities to some of the changes" in sentence 5 contrasts "the future is a blank" in sentence 1. Also "we can assign probabilities to some of the changes that lie in store for us" in the conclusion sentence 5 mirrors the introduction "we must anticipate change" (sentence 2). So, 2415. Sentence 3 does not fit in with the flow. It needs a precedent and more substantiation. "limits to the amount of newness" would need further elaboration.
Ans: (2415)

3. On a careful reading of the sentences, it can be observed that sentence 5 is a general sentence that begins the para. It introduces the background: inner psychological states and personal histories are important in explaining our behaviour. We can infer that this para is taken from the middle of the text as 'this does not mean' in sentence 5 needs a precedent. Sentence 5 is followed by sentence 4. 'deeply disturbed backgrounds' in sentence 4 links with 'personal histories' in sentence 5. Also 'some kind of psychiatric disorder' in sentence 4 links with 'inner psychological states' in sentence 5. "engage in violent acts, for example," in sentence 4 links with "explaining our behaviour" in sentence 5. Sentence 3 follows sentence 4. 'actually committing a violent act' in sentence 3 links with 'those who engage in violent acts' in sentence 4 and the former is different from "being inclined toward violence". Sentences 3 and 2 form a mandatory pair. Sentence 2 (For a crime to be committed) provides a condition for "actually committing a violent act" given earlier in sentence 3. "tip a troubled person toward violence" links with "actually committing a violent act". So, 5432. Sentence 1 does not fit in with the flow and is the odd sentence out.

Ans: (5432)

4. On a careful reading of the sentences, it can be observed that sentence 3 is a general sentence that begins the para. It introduces the charge which judges in the first-century Celtic legal system received. Sentences 3 and 5 form a mandatory pair. "This Celtic charge" in sentence 5 links with "first-century Celtic legal system received this charge" in sentence 3. "two separate, yet complementary imperatives" in sentence 5 points to "Listen with each ear, then render judgment" in sentence 3. Sentences 2 and 1 in that order complete the para. Sentence 2 follows sentence 5. "First" in sentence 2 points to the first of "two separate, yet complementary imperatives" given in sentence 5. Also, "faculties when gathering and absorbing information; keep all your senses open" in sentence 2 links with "Listen with each ear" mentioned earlier in sentence 3. Sentence 1 follows sentence 2. "Second" in sentence 1 points to the second of "two separate, yet complementary imperatives" given earlier in sentence 5. "only after listening, not during or before." in sentence 1 links with "then render judgment." mentioned earlier in sentence 3. So, 3521. Sentence 4 runs tangent to the text as it discusses another point of view (withholding judgment ... counter to human instinct." It needs further elaboration and can be a part of another para. Ans: (3521)

Solutions for questions 5 to 10:

Number of words and Explanatory notes for RC:

Number of words: 628

5. The passage refers to bullionism in the second paragraph. According to the passage, "Boiled to its essence mercantilism is "bullionism"". But the passage mentions Mr Grampp who states that "we should stop confusing mercantilism and bullionism". Further, "Mercantilist thinkers were most concerned with maximising employment".
Option A: The essence of mercantilism is bullionism. Hence, bullionism is a core principle of mercantilism. But we cannot say that mercantilism is a part of bullionism. Hence, this is not the correct answer.
Option B: We can say that bullionism is the core precept of mercantilism. But we cannot infer from the passage that it is its only precept because the passage refers to mercantilist thinkers who consider employment to be important. Hence, this is not the correct answer.
Option C: The author mentions that bullionism is the idea that "the only true measure of a country's wealth and success was the amount of gold that it had". However, mercantilism, as pointed our by Mr Grampp is different from bullionism. Maximizing employment was important for mercantilist thinkers. Further, mercantilists "were alarmed by the idea of hoarding gold and silver". Hence, mercantilist thought did not advocate for increasing gold reserves but placed importance on other aspects like maximizing employment. Choice C is the correct answer.
Option D: We cannot infer from the passage that the principles of bullionism led to the formation of mercantilism. Hence, this is not the correct answer.
Therefore, the correct answer is option C.

Choice (C)

6. The author talks about Keynesian economics in the seventh paragraph of the passage. Mr Grampp suggests that "Keynesian economics "has an affinity to mercantilist doctrine"".
Option A: The passage does not suggest that Keynesian economic principles are based on mercantilism. According to Mr. Grampp, Keynesian economics has an "affinity" to mercantilism. This is not sufficient to infer that most of the Keynesian principles are based on mercantilism. Hence, this is not the correct answer.
Option B: Keynes approved of mercantilists because "an ample supply of precious metals could be key… to ensuring **adequate workforce utilisation**". Also, "many mercantilist thinkers were most concerned with maximising employment". Hence, both these schools of thought placed importance on maximizing employment. Therefore, this is the correct answer.
Option C: We cannot infer from the passage that the primary objective of Keynesian economics is obtaining ample supply of precious metals. Ample supply of precious metals helps in achieving the objective of adequate workforce utilization. Therefore, this is not the correct answer.
Option D: From the sixth paragraph of the passage, we can infer that mercantilist thought was not based on bullionism. Further, Keynesian economics only refers to bullionism (as it talks about "an ample supply of precious metals") and is not based on the principle of bullionism. Hence, this is not the correct answer. Therefore, the correct answer is option B. Choice (B)

7. The passage mentions Adam Smith in the last two paragraphs of the passage. Adam Smith was "concerned with the effects of some mercantilist policies". His objections were "the damage that overweening government intervention could do", "greedy barons could earn "wages or profit, greatly above their natural rate"" and "legislators could use mercantilist logic to justify stifling regulation".
The first point is discussed in the next paragraph and it is clarified that he "was not opposed to regulation per se" but was concerned about individuals and governments abusing the positions of power.
Hence, regarding all the three points, Smith's objection is related to misuse of power by individuals in the name of mercantilism.
Option A: Smith was more concerned with the effects of mercantilism. We cannot infer from the passage that he was against the principles that mercantilism was based on.
Option B: This option is incorrect because of two reasons. First, we cannot infer from the passage that mercantilist policies "advocate" creation of monopolies (we can infer that it advocates government interventions because of the trade restrictions that it places). Second, Smith was not opposed "to regulation per se" but was concerned about abuse of power. Hence, this option is incorrect.
Option C: The passage does not talk about Smith trying to explain the economic situation of his time. Hence, this is not the correct answer.
Option D: The objections mentioned by Smith are against the persons who misuse the power (barons being greedy, legislators to justify stifling regulation and individuals abusing power for personal gain). Hence, this is the correct answer. Choice (D)

8. The first paragraph of the passage talks about how mercantilism has become the "whipping boy" in history of economics and it has become a "historical artefact".

"Whipping boy" refers to a person who is blamed or punished for the faults or incompetence of others.
Option A: The passage states that "Mercantilism is one of the great whipping boys in the history of economics". This implies that mercantilism was blamed unjustly for many economic issues that arose during the time. But this does not imply that mercantilism was the actual reason for the issues. Hence, this is not the correct answer.
Option B: The passage mentions that mercantilism is "now considered no more than a historical artefact" and "no self-respecting economist would describe themselves as mercantilist". The self-respecting economists refers to economists now and not the economists of the 16^{th} – 18^{th} centuries. Hence, this is not the correct answer.
Option C: The passage does not talk about the economists who adopted mercantilist practices during the 16^{th}, 17^{th} and 18^{th} centuries in the first paragraph. Hence, this is not the correct answer.
Option D: Since the passage states that Mercantilism is a whipping boy, we can infer that many issues were attributed to mercantilism unfairly. Hence, this is the correct answer. Choice (D)

9. The author talks about various features of mercantilism throughout the passage.
Statement I: According to Mr Grampp, "mercantilists were keen on foreign trade". Hence, this is a feature of mercantilism.
Statement II: The author mentions that "The best way of ensuring a country's prosperity was to make few imports and many exports". Hence, this is also one of the features.
Statement III: Adam Smith was opposed to government interventions. But mercantilism depends on government intervention to increase exports and reduce imports. The author provides an example in the third paragraph of the passage. Hence, mercantilists were not opposed to government interventions. Hence, this is not a feature of mercantilism.
Statement IV: Mercantilists require government intervention to increase exports. Hence, we can infer that they may be against complete absence of government interventions. Hence, we cannot say that this is definitely not a feature of mercantilism.
Hence, only III is definitely not a feature of mercantilism.
Choice (A)

10. In the fourth paragraph, the author states that "there is an important distinction between mercantilist practice and mercantilist thought". The author mentions that the opinions of the thinkers were not accurately reflected in mercantilist policies. On close observation, we can see that the second and third paragraphs talk about the mercantile practice, about how bullionism was adopted by governments. The fifth and sixth paragraphs of the passage provide the opinion of Mr Grampp, who talks about mercantilist thought (the "mercantilist thinkers" are referred to in the sixth paragraph).
Option A: The passage mentions that the mercantilist thinkers "were alarmed by the idea of hoarding gold and silver". Hence, we cannot say that mercantilist thought considers bullionism to be important. Therefore, this is not the correct answer.
Option B: This option is also incorrect because mercantilist thought does not consider bullionism to be the cornerstone of mercantilism.
Option C: Mercantilist thought considers maximizing employment to be important. The passage mentions that "many mercantilist thinkers were most concerned with maximising employment". However, in practice, this was "mangled" and led to bullionism being considered important. Hence, this is the correct answer.
Option D: Mercantilist practice considers foreign trade to be important. The passage talks about the British government placing importance on traders and about the Navigation Acts. However, according to Mr Grampp, "mercantilists were keen on foreign trade". Hence, in thought and practice, foreign trade was considered important by mercantilists.
Therefore, the correct answer is option C.
Choice (C)

Solutions for questions 11 to 14:

11. A question is posed in the first sentence and the reason is provided in the second sentence of the paragraph. Evolution did not favour complex probabilistic thinking. There are other clues in the paragraph that tell us that the first blank can be filled with the word 'confuse'. These clues include: ... we are disposed to make snap decisions, minimal evidence, than those who preferred to test this hypothesis experimentally. 'rhapsodize' is out of context. It means to write about someone or something with great enthusiasm and delight. 'embody' means to give a bodily form to, to incorporate. It is inapt in the first blank. "Embody _____ with _____" is incorrect construction. One can only say "..... that embody a/ the ....." or "embody in". Choice 1 fills the first blank.
The second blank needs a synonym of 'minimal evidence' (We are disposed to make snap decisions on the basis of minimal evidence.) The second blank will take the word 'facile' which means 'superficial'. 'Fake' (which has a very negative connotation) and 'verisimilar' (appearing to be true or real; probable) are incorrect. Choice 5 is correct for the second blank.
The third blank needs to contrast 'test this hypothesis experimentally'. It will take the words "crude assumption" which parallel "minimal evidence" and "facile theories" used earlier. "on the remote possibility" will be a structural distortion. One needs to add: based on the remote possibility. "slightest pretext" is a misfit for the third blank. Choice 9 is correct. Ans: (159)

12. Something very fundamental has happened in world history. We can say that a flood of articles have commemorated the end of the Cold war. 'Commemorated' means 'recognized', 'acknowledged' or 'honoured'. 'ruminating' means 'contemplating' or 'considering'. 'ruminating' needs to be followed by the preposition 'on'. 'mulling' needs to be used with the preposition 'over' (mulling over). So choice 3 fills the first blank.
The second blank needs a synonym for 'structure' that the superficial analyses lack. The second blank is best completed by 'conceptual framework'. Choice 4 is the correct answer for the second blank. Choices 5 and 6 do not fill the second blank correctly. 'obviation' means to keep from happening or render unnecessary.
The third blank (distinguishing between what is essential and what is _____) needs an opposite of 'essential' and a synonym of 'accidental'. The correct word would be 'contingent' which means liable but not certain to occur; possible; unpredictable. Choice 7 fills the third blank. 'plausible' does not contrast 'essential'.
Ans: (347)

13. The sentence indicates that the species being talked about are harmful to the habitat. The species end up settling in places where they don't belong because of human activity. Since it is unlikely that an entire species would be peevish, we eliminate choice 1. 'exacerbating' means to make a situation worse, but we will not use the term 'exacerbating' to describe a species. Hence the first blank is filled with the word 'invasive' which means 'tending to spread very quickly and undesirably or harmfully'. Choice 2 is correct.
The second blank needs a synonym for 'potent'. 'galvanising' means 'stimulating or motivating (someone) into taking action' and best completes the second blank. 'expunging' means to 'obliterate or remove completely (something unwanted or unpleasant)'. Appropriating' means 'allocating/ earmarking/ assigning/ budgeting' or 'seizing or taking (something) for one's own use, typically without the owner's permission'. 'Expunging' and 'appropriating' cannot be used to describe ideas. Choice 6 fills the second blank.

The para ends by saying that we can help nature heal from the damage we humans have done to it as a civilization. 'Flouting' which means showing contempt towards (or disrespecting) rules, customs, norms or traditions, cannot be applied to species or habitats.
'Supplanting' which means 'displacing' or 'replacing' can be used but not 'supplanted'. Only 'infiltrating' (to gain access surreptitiously and gradually) fits in the third blank.
Ans: (267)

14. The para gives a brief history about the diamond Lesedi La Rona. In the first blank, 'extricated' does not fit. 'extricate' means to free (someone or something) from a constraint or difficulty. 'addled' means to become mentally confused. 'Forged' fits in the first blank. Forged here means to form or make, especially by concentrated effort. Choice 3 fills the first blank. The stone was formed in molten rocks hundreds of kilometres beneath the Earth's surface. Note that the word 'unearthed' appears later in the para.
The vastness of time and the power of nature give diamonds their _____. We need a noun in the second blank. 'Baroque' and 'titillation' do not fit the second blank. 'Baroque' is a style of architecture and art originating in Italy in the early 17th century. 'titillation' means to excite or arouse agreeably. Diamonds can be characterized by their mystique (an aura of mystery or mystical power surrounding them). Hence choice 6 completes the second blank. Diamonds are associated with 'mystical properties' but the auction flopped.
The last blank needs a negative word. Diamonds cannot protect the industry from a trio of forces that are _____ businesses everywhere. The best word among the choices for the third blank is 'upending' which is a strong negative word meaning: to invalidate, destroy, or change completely; overthrow. 'Relinquishing' means to give up or abandon. It does not fit the context. 'immured' means to confine within or as if within walls; imprison. It does not fit the context. Choice 9 completes the last blank.
Ans: (369)

Solutions for questions 15 to 20:

Number of words and Explanatory notes for RC:

Number of words: 687

15. The author opines in the first paragraph of the passage that, for the World Wide Fund for Nature, "a better icon might be an elephant".
Option A: The author does mention that the cause for the endangerment of giant pandas is "a loss of habitat as Earth's human population increases". The author argues that elephants are a better icon because they are "not mere collateral damage" but are "deliberate targets" for various groups like poachers, cattle-herders and farmers. Since this option only talks about poachers, it is incomplete and is not an appropriate answer.
Option B: While the author mentions that giant pandas are endangered, he does not mention or imply that elephants are an endangered species. He only mentions that there has been a decline in the numbers of elephants. But this is not enough to support this option.
Option C: Giant pandas have become endangered because of "a loss of habitat as Earth's human population increases". According to the author, elephants "are **not mere** collateral damage". From this, we can say that they more than just collateral damage in humanity's expansion, i.e., they are **also deliberate targets**. Hence, it is incorrect to say that elephants are not collateral damage.
Option D: The author mentions that, unlike giant pandas, elephants are not just collateral damage but are also deliberate targets. Hence, we can say that humans have been a more direct cause for the dwindling numbers of the elephants. Therefore, this is the correct answer.
Choice (D)

16. In the second paragraph, the author points out that "an elephant needs a lot of room". He also mentions about conversion of bush into farmland. This brings about a competition for available land between elephants and humans.
Option A: The author talks about the competition for available land towards the end of the second paragraph. In the third paragraph, the author mentions "The question, **then,** is whether elephants and people can ever co-exist **peacefully**." We can interpret this statement as given the competition for land between humans and elephants, can humans and elephants co-exist peacefully. The issue of poaching is mentioned at the beginning of the second paragraph and is not related to why this question is posed. Hence, this is not the correct answer.
Option B: From the above explanation, we can see that the author asks the question because of the competition for available land. The people who worry that the answer may be no do so because of the loss of habitat for the elephants. Hence, this is the correct answer.
Option C: According to the passage, "many of those who worry that the answer may be "no" fear the loss of more than just another species of charismatic megafauna." Even though the author mentions that elephants are intelligent in the subsequent parts of the passage, the reason why many worry that the answer may be "no" is not the intelligence of the elephants. Hence, this is not the correct answer.
Option D: The author does not talk about the damage that the elephants do to the crops in this context. Hence, this cannot be the correct answer.
Therefore, the correct answer is option B.
Choice (B)

17. According to the passage, "the nuclei of their social arrangements are groups of four or five females and their young that are led by a matriarch".
Option A: The author mentions that the young are also a part of the group. The young includes both males and females. But males "depart their natal group when maturity beckons at the age of 12". Hence, we cannot say that elephants are not a part of a nuclei during their lifetimes.
Option B: While the author mentions that male elephants leave the natal group after attaining 12 years of age, he does not mention that they come back to their natal group after becoming a father. Hence, this is not the correct answer.
Option C: The author mentions that female elephants "usually remain in it throughout their lives". But we cannot say that a female will always be a part of a group throughout her life.
Option D: Since the author mentions that "males depart their natal group when maturity beckons at the age of 12", we can say that a male elephants will not be a part of the group after the age of 12. Hence, this is the correct answer.
Choice (D)

18. The author raises the question "whether elephants and people can ever co-exist peacefully". In the subsequent paragraphs of the passage, the author indicates what makes elephants so special (viz., their intelligence and higher levels of social organization).
Option A: The author does not try to answer the question in the subsequent paragraphs of the passage. The author does not talk about whether humans and elephants can co-exist peacefully or how they can co-exist peacefully. Hence, this is not the correct answer.
Option B: The author states that "many of those who worry that the answer may be "no" fear the loss of more than just another species of charismatic megafauna". This does not imply that majority of the people think that the answer to the question is no. It only implies that, of the people who think that the answer is no, majority of them believe that elephants are more than just another species of charismatic megafauna. Hence, this is not the correct answer.
Option C: In the subsequent paragraphs, the author highlights various features of elephants which make them

important. The author is highlighting why we should try and protect elephants. Hence, we can say that the author hopes humans and elephants co-exist peacefully, i.e., he believes that it is important that we find an affirmative answer (i.e., an answer of "yes") to the question that he posed. Therefore, this is the correct answer.
Option D: The author does not talk about the consequences of the possible answers (which can be "yes" or "no") to the question he posed. He only talks about the features which make elephants special. Hence, this is not the correct answer.
Therefore, the correct answer is option C.

Choice (C)

19. Dr Wittemyer praises elephant society for its "near-human sophistication". The author goes on to describe (from the fourth paragraph of the passage onwards) the organization of the society of elephants. Individual elephants are grouped into families, which in turn form kinship groups, each of which is part of a clan.
Option A: The author mentions how the elephants form groups in fifth paragraph of the passage. But the author states that this would "not deserve Dr Wittemyer's accolade of near-human sophistication". Hence, this is not a reason for Dr Wittemyer to argue for the human-level complexity in elephant society.
Option B: The author states that lions also "live in matriarchal family groups that eject maturing males". But elephants "have higher levels of organization" like kinship groups and clans, which are explained in the subsequent paragraphs. This is why Dr Wittemyer argues that "human beings aside, no species on Earth has a more complex society than that of elephants". Hence, this is the correct answer.
Option C: In the last paragraph of the passage, the author mentions that "All clan members are known to one another". But Dr Wittemyer was talking about the society of the elephants and not any particular feature (i.e., not just the ability to recognize other elephants). Hence, this is not the correct answer.
Option D: As explained in the option above, this is just another feature which contributes to the complexity in elephants' society and is not the reason for Dr Wittemyer's accolade. Hence, this is not the correct answer.
Therefore, the correct answer is option B.

Choice (B)

20. The author says that most adult females "have, at any given moment, a single, dependent calf" and "will not give birth again until this offspring is self-sufficient".
Option A: We can infer from the passage that sexually receptive females are considered rare by male elephants because they "will not give birth again until this offspring is self-sufficient, which takes about four years." Hence, we can say that they are not sexually receptive for significant periods.
Option B: The author did not compare the number of male and female elephants in a group in the passage. Hence, this is not the correct answer.
Option C: While the author states that a male will be lucky to achieve fatherhood "before he is in his 20s", this is because of competition with other males rather than the sexual receptivity of the females. Hence, this is not the correct answer.
Option D: During the dry seasons, the clans come together because "the amount of habitat capable of supporting elephants is restricted". However, this need not be true of families and individuals. Hence, this is not the correct answer.
Therefore, the correct answer is option A.

Choice (A)

Solutions for questions 21 to 24:

21. (a) Mopped means 'to wipe with a piece of cloth'. 'Moped' means 'felt miserable'. (1) is suitable.
(b) 'Punitive' means harsh or intended to punish and 'puny' means small or weak. Hence (1).
(c) 'To clamour' means 'to raise an outcry' whereas 'to clamber' means 'to climb with effort or difficulty'. The stress on the awkward positioning of the pile of shoes makes 'clamber' more appropriate. Hence (2).
(d) 'skittered' is to move lightly and quickly. 'scuppered' is an attempt to spoil something. Here (1) is correct.
(e) The first sentence talks about an antique wall clock which must be expensive; hence the correct phrase is 'a king's ransom' which means very expensive. 'a pretty dollar' is an incorrect idiom. It should be replaced by 'a pretty penny'. Hence (2).
The final correct answer is 11212. Ans: (11212)

22. (a) 'Mastery' of a particular skill shows that you have learned or understood it completely and have no difficulty using it. 'Masterly' is an adjective – a masterly performance. It also means highest level of ability and skill. In this context, 'mastery' – the uncountable noun – is appropriate. Hence 1.
(b) The adjective 'vigilant' means to give careful attention, while 'vigilante' are people who organize themselves into an unofficial group to protect their community. Hence 2.
(c) 'Concussion' is damage to the brain caused by a blow, whereas 'concision' is conciseness. Hence 1.
(d) 'Unapologetic', which means unwilling to apologize is the correct usage and not non-apologetic for the first part of sentence d. Hence 2.
Autocracies function by asserting their view as the dominant view. So, 'assertive' fits the latter part. 'Affirmative' is to give assent and does not make any sense here, as the object of 'affirmative' is absent. Hence 1.
The final answer is 12121. Ans: (12121)

23. (a) 'Rigorously' means carefully and thoroughly. 'Vigorously' means done with great energy and enthusiasm. Here 'vigorously' is apt. So 2 is correct.
(b) 'Reverent' means showing great respect and 'reverend' is a title used before the name of an officially appointed religious leader. Hence 1.
(c) *Loath* is an adjective meaning unwilling and is the appropriate word for the first sentence. *Loathe* is a verb (used with an object, Eg. He *loathes* liars) meaning intense hatred. So (2) is appropriate.
(d) 'deprecate' means to criticize and 'deprecate' is to lose value. Hence 1 is apt.
(e) *Complacent* means self-satisfied and hence unconcerned; *complaisant* means inclined to please or oblige. It also means you are willing to accept what other people are doing without complaining. *Complacent* has a negative connotation to it while *complaisant* is a positive feature. *Complacent* best fits the second blank. Hence, [1].
The final answer is 21211. Ans: (21211)

24. (a) *perspicacity* is discernment or clearness of understanding whereas 'perspicuity' is lucidity or clearness of expression. Hence 1.
(b) 'pining' is feeling sad. 'pinning' means fastening. Hence 1.
(c) 'plaintive' expresses sorrow or melancholy, whereas a 'plaintiff' is a person who brings suit in a court. Hence 2.
(d) Nonchalant means casual, not to worry or care about things. Noncommittal means deliberately not to express opinion or intention. Therefore 'nonchalant attitude' is apt. Hence (2).
(e) Credible means believable, reliable and creditable means deserving credit or praise; *credible* fits into the sentence since it is used as believable or reliable. Hence 1.
The final answer is 11221. Ans: (11221)

Solutions for questions 25 to 30:

Number of words and Explanatory notes for RC:

Number of words: 696

25. Option A: Choice A is partly stated in the passage. The conventional means of correction - a letter to the journal concerned - may take months. But there is now an

alternative. PubPeer is a website that allows people to comment anonymously on research papers and so, in theory, helps purge the scientific literature of erroneous findings more speedily. But choice A is not the assumption behind which PubPeer operates.
Option B: But it has also attracted criticism, not least from journal editors, some of whom argue anonymity's cloak lets vendettas flourish unchecked. Now the site is embroiled in a court case that tests the limits of free speech under America's First Amendment, and may define what is permissible for researchers to say online and anonymously about science. ..... It is impossible to contact PubPeer's commenters to establish what they know about allegations without knowing their identities, Nick Roumel, Dr. Sarkar's lawyer says. ..... The anonymity of PubPeer's commenters is protected by American law. .... The supporters of PubPeer argue that the First Amendment protects "unfettered scientific discourse". Hence choice B is the hidden assumption behind which PubPeer sought to operate.
Option C: "pay the website for peer reviewing scientific papers and exposing cases of scientific misconduct" is not indicated in the passage. Choice C is not the answer.
Option D: While it is true that PubPeer sought to help purge the scientific literature of erroneous findings quickly, this is through reviews by peers and not by the common man. Choice D is not the assumption made by PubPeer in its working.
The correct answer is choice B. Choice (B)

26. Nick Roumel is the lawyer representing Dr. Sarkar in the case.
Option A: Choice A is not true of Nick Roumel but it is true of Alex Abdo, the lawyer of the American Civil Liberties Union which has taken over the case on PubPeer's behalf. Mr. Abdo asserts that the comments identified by Dr. Sarkar are not defamatory. Therefore PubPeer should not be forced to disclose the commenters' identities. Hence choice A is logically incorrect and not applicable to Nick Roumel.
Option B: Choice B has not been indicated in the passage and is not the answer.
Option C: It is impossible to contact PubPeer's commenters to establish what they know about allegations without knowing their identities, Nick Roumel says. PubPeer objects to revealing the identity of the last commenter who had confirmed on the site that s/he had reported Wayne State University's problems with Dr. Sarkar's papers. Mr Roumel wants to know the identities of all of them. Choice C is the answer.
Option D: Dr Sarkar's lawyer, Nick Roumel, argues that the law should not provide anonymous commenters with more protection than it gives those who post under their real names. Choice D would not be a stance taken by Dr. Sarkar's lawyer. Choice (C)

27. Option A: The PubPeer site is embroiled in a court case that tests the limits of free speech under America's First Amendment, and may define what is permissible for researchers to say online and anonymously about science. But choice A is not specific to the views of Harold Varmus and Bruce Alberts. Choice A cannot be inferred from the passage.
Option B: By contrast, Dr Sarkar's lawyer, Nick Roumel, argues that the law should not provide anonymous commenters with more protection than it gives those who post under their real names. But we cannot infer from the passage that Harold Varmus and Bruce Alberts are furious with Nick Roumel. Choice B cannot be inferred from the passage.
Option C: Two giants of science: Harold Varmus, a Nobel Prize-winning cancer researcher, and Bruce Alberts, a former president of the National Academy Of Sciences also supported PubPeer. They argued that the First Amendment protects "unfettered scientific discourse". Hence choice C is the answer.
Option D: Choice D is out of scope and is not the answer to the question. Choice (C)

28. PubPeer is a website that allows people to comment anonymously on research papers and so, in theory, helps purge the scientific literature of erroneous findings more speedily. So choice C is incorrect. PubPeer has also attracted criticism, not least from journal editors, some of whom argue anonymity's cloak lets vendettas flourish unchecked. Now the site is embroiled in a court case that tests the limits of free speech under America's First Amendment, and may define what is permissible for researchers to say online and anonymously about science. .... Dr. Sarkar sued the commenters for defamation and subpoenaed Pubpeer to disclose their identities. Hence choice D is the correct answer. Choices A and B are not specific to the question. Choice (D)

29. Option A: Philip Cunningham, who convened the Wayne State panel that investigated Dr. Sarkar, said all evidence was carefully considered and the university stands by the integrity and accuracy of the report. So Philip Cunningham cannot be on Dr. Sarkar's side. Nick Roumel is the lawyer of Dr. Sarkar. Choice A is not true and is the answer.
Option B: The American Civil Liberties Union has taken over the case on PubPeer's behalf. Its lawyer, Alex Abdo, says that the anonymity of PubPeer's commenters is protected by American law unless Dr Sarkar can provide evidence that their statements are false and have damaged his reputation. Hence choice B is correct and is not the answer.
Option C: A prolific pseudonymous whistle blower named Clare Francis is known to have e-mailed Wayne State in November 2013, to notify it of concerns with Dr Sarkar's work aired on PubPeer, adding in her email (if, indeed, "Clare Francis" Is a woman) that, in some cases, they amounted to "what many think of as scientific misconduct." So choice C is true and is not the answer.
Option D: Dr Sarkar claims that certain commenters insinuated he was guilty of scientific fraud. The comments, along with anonymous e-mails sent to the University of Mississippi, cost him the offer of a professorship there. In October 2014 he sued the commenters for defamation. … Dr. Sarkar's reputation has been destroyed. Therefore choice D is correct and is not the answer.
Choice (A)

30. Option A: Choice A is ruled out because the passage does not attack an entire industry or line of work.
Option B: The passage elaborates on a court case which may define the limits of anonymous scientific criticism as allowed by PubPeer. Dr. Sarkar is the principal character in this case. Other specific details of the case are also mentioned. Hence choice B is the answer.
Option C: While the first part of choice C may appear to be true (..... the anonymity's cloak adopted by PubPeer may let vendettas flourish unchecked .....), the second part of choice C is not justified by the passage. The passage does not advocate a return to the conventional means of scientific journal correction viz. a letter to the journal concerned. Hence choice C is not the answer.
Option D: Choice D is ruled out by 'startling revelation' which is a little melodramatic, and by 'countered'. Hence choice D fails to explain the correct organization of the passage. Choice (B)

Solutions for questions 31 to 34:

31. The highlighted sentence is too specific to be upstream of the given para. So (1) is not the answer.
The highlighted sentence does not belong to blank (2). The highlighted sentence would interfere with the thought flow if placed in blank (2). The sentences preceding blank (2) talks about essential difference between living things and inanimate clumps of carbon atoms.. Also "former tend to be much better at capturing energy" as mentioned in the sentence following blank 2 points to "living things" as given in the sentence preceding blank 2.
The sentences preceding blank 3 talk positively about living things (at capturing energy ....). There is even talk of a

mathematical formula. The sentence succeeding blank 3 again discusses the mentioned formula. So if the highlighted sentence is placed in blank 3, it would interfere with the thought flow.
The highlighted sentence best fits in blank (4) as it connects well with the penultimate sentence. "under certain conditions" as given in the highlighted sentence refers to "when a group of atoms is driven by an external source of energy (like the sun or chemical fuel) and surrounded by a heat bath (like the ocean or atmosphere)"as given in the penultimate sentence. "dissipate increasingly more energy" in the penultimate sentence of the para links with "acquires the key physical attribute associated with life" in the highlighted sentence and resonates with dissipating that energy as heat" in the sentence after blank (2). The highlighted sentence best concludes and completes the given paragraph.
Hence (4) is the location where the highlighted sentence could be inserted.
The highlighted sentence, if placed downstream of the paragraph, would mean that the given para would remain incomplete. Hence (5) is not the answer.

Ans: (4)

32. The paragraph begins by saying that ammonia is repulsive to animals as it is toxic. The highlighted sentence has the contrast conjunction 'but'. We need to place this highlighted sentence ahead of a sentence which speaks positively about ammonia.
The highlighted sentence can be placed only in blank (2). "actually attracted" and "Far from being repelled" in the sentence after blank (2) contrasts "repulsive" in the sentence before blank (2). The highlighted sentence forms a bridge between the sentence preceding blank (2) (It is extremely toxic) and the sentence succeeding blank (2) (Sharks are actually attracted to it). So sharks are an exception to the rule that ammonia is toxic to most marine animals and land-lubbing ones. The highlighted sentence will disrupt the thought flow if it is placed in blank 3 and blank 4.
The highlighted sentence would need other specific information along with it to be placed upstream or downstream of the paragraph. Hence (1) and (5) are not the answers. Ans: (2)

33. On a reading of the paragraph, one can understand that the paragraph talks about decision making and the stress related to it – overall, a para presenting a somewhat negative state of things. The highlighted sentence, on the other hand indicates a neutral (and potentially positive) consequence of this state.
On a careful reading of the paragraph, it can be inferred that the highlighted sentence does not belong to blank (2). The sentence is completely out of place in blank (2), as it interrupts the flow of thought. "third form of overstimulation – decision stress" in the sentence before blank (2) needs to be followed immediately by "require them to make faster and more complex decisions" as given in the sentence after blank (2).
The highlighted sentence is a misfit in blank (3). The sentence preceding blank (3) has some facts "yearn to break out into new jobs or roles that require them to make faster and more complex decisions." The highlighted sentence interferes with the thoughtflow if placed in blank (3). "But among the people of the future, the problem is reversed." needs to be placed immediately after the sentence "individuals tapped in ***dull or slowly changing environments*** yearn to break out into new jobs or roles that require them to make ***faster and more complex decisions***.." The first three sentences of the paragraph, as given, need to run continuously without any extraneous sentences being placed in locations (2) and (3).
The highlighted sentence cannot be a part of blank (4). If the highlighted sentence is placed in blank (4), then there will be a complete distortion of thoughtflow as "feel harried and upset" in the last sentence of the para as given, links perfectly with "race anxiously from task to task" in the sentence prior to blank 4. Also the highlighted sentence in the question has the contrast conjunction '**yet**' and this does not continue well after the sentences "**But** among the people of the future, the problem is reversed. "Decisions, decisions ..." they mutter as they race anxiously from task to task.
We can say that the para ends perfectly with the sentence "The reason they feel harried and upset is that transience, novelty and diversity pose contradictory demands and thus place them in an excruciating double bind."
The highlighted sentence can be best placed in a para succeeding the given para. "that transience, novelty and diversity pose contradictory demands" in the last sentence of the para brings the para to an end. The highlighted sentence can be the first sentence of the very next para. It would need further elaboration. "very newness of the circumstances" in the highlighted sentence runs parallel to "transience, novelty and diversity" given in the last sentence. "contradictory demands and thus place them in an excruciating double bind"given in the last sentence links with "revolutionary change in the nature of the decisions" in the highlighted sentence.
Hence the correct answer is (5). Ans: (5)

34. On a cursory reading of the paragraph, one can understand that the paragraph talks about the cold environment and the view outside the window.
The highlighted sentence is a poor example of an introductory statement of the paragraph or even as an upstream statement. The paragraph best begins with the general sentence: Dr. Robert Stadler paced his office, wishing he would not feel the cold. The highlighted sentence can only be placed after a reference to views such as "Beyond the window, the dead gray of the hills ..... a distant patch of hillside flared into a silver-yellow .... etc".
The sentences preceding blank 3 talk about the view outside the window. The sentence just preceding blank (3) is: It was not cold in the office, thought Dr. Stadler. So the highlighted sentence "It was that view that froze the place" can be best placed in blank 3. The sentence succeeding blank 3 reinforces the fact that it was not cold in the office. "It was that view that froze the place" in the highlighted sentence links with "the chill was in his bones (even though it was not cold)" in the sentence after blank (3).
The highlighted sentence does not fit in blank (4) as it would interfere with the thought flow. The last two sentences of the paragraph need to run continuously as they refer to Dr. Robert Stadler's thoughts. "growing intrusion of the accidents of nature into the affairs of men" in the last sentence refers to "such a matter as inadequate heating and people had talked about conserving fuel" in the penultimate sentence of the para. Ans: (3)

Solutions for questions 35 to 37:

Number of words and Explanatory notes for RC:

Number of words: 378

35. Sweden is a victim of its own generosity and success. No European country has a larger proportion of refugees in its population and in 2015 none welcomed a larger flow of asylum-seekers, proportionate to its population, than Sweden did. Employment rates for refugees are no lower than in most European countries.
Option A: No European country has a larger proportion of refugees in its population and in 2015 none welcomed a larger flow of asylum-seekers, proportionate to its population, than Sweden did. The first part of choice A is true but the second part of choice A cannot be inferred from the passage.
Option B: The economy is growing, vacancies are plentiful, only 5% of 15-74-year-old native-born Swedish workers are jobless and the unemployment rate is falling. But foreign-born workers are three times as likely to be unemployed. So "resulting in unemployment problems for the native Swedes" as given in choice B is incorrect.

Option C: But foreign-born workers are three times as likely to be unemployed, and the ratio is rising. Hidden discrimination, housing problems and a Swedish reliance on informal networks help explain the gap. But many refugees simply lack the skills for Sweden's job market. Highly educated migrants also lag behind their Swedish born peers in finding work. Fewer than 5% of jobs are now low-skilled, requiring less than a high-school qualification, compared with 9% in Germany and 16% in Spain. Hence choice C is the answer.
Option D: Choice D is out of scope of the given passage.
Choice (C)

36. Option A: Only 5% of 15-74-year-old native-born workers are jobless and the unemployment rate is falling. But foreign-born workers are three times as likely to be unemployed, and the ratio is rising. Hidden discrimination, housing problems and a Swedish reliance on informal networks help explain the gap. Choice A is stated in the passage but is not attributed to Magnus Henrekson.
Option B: Fears are mounting about the social impact of the two-tier labour market that is developing. Magnus Henrekson, an academic, fears further ghettoisation and alienation. "to ghet·to·ize" means to confine or restrict to a particular area, activity, or category; to isolate; to set apart. Hence choice B is the specific answer.
Option C: Fears are mounting about the social impact of the two-tier labour market **that is developing.** Hence choice C which is futuristic with reference to the development of the two-tier labour market is incorrect.
The correct answer is choice B. Choice (B)

37. Statement (a): Statement (a) sounds paradoxical. But it has not been mentioned in the passage.
Statement (b): Many refugees simply lack the skills for Sweden's job market. But (b) is besides the point and is not an answer to the question.
Statement (c): The paradox, says Thomas Liebig, from the OECD, is that Sweden has among the most advanced refugee-integration policies. But we cannot say that refugees **do not wish to work** in Sweden. Hence (c) is incorrect.
Statement (d): Nearly all Swedes have high school diplomas, yet only half of new arrivals do, according to government statistics. This is not according to Thomas Liebig. Hence (d) does not answer the question.
Statement (e): The paradox, says Thomas Liebig, from the OECD, is that Sweden has among the most advanced refugee-integration policies. A two-year programme is meant to make refugees "job-ready", but is often too long for educated refugees and too short for those lacking basic literacy and numeracy. Only 22% of low-educated foreign-born men and 8% of women found work in the year after completing the programme. On average it takes seven to eight years for newcomers to find employment. Hence statement (e) is the answer. Choice (D)

Solutions for questions 38 to 40:

Number of words and Explanatory notes for RC:

Number of words: 468

38. Does such a world in which morality would have been transmitted into inherited instinct exist? You may answer – In heaven and nowhere else. But the world of insects actually furnishes examples of such moral transformation. Writers such as Sir John Lubbock and Herbert Spencer say that certain kinds of social insects have immensely surpassed men, both in social and in ethical progress. Hence choice B is the answer. Choices C and D are far-fetched. Choice A is incorrect. From the part "certain kinds of social insects have surpassed men", we cannot infer that insects **seem to make better use** of a moral compass than humans do. Hence choice A is ruled out.
Choice (B)

39. Refer to the first para of the passage. As I address you today, it seems to me a lecturer's duty to tell you .....
Option A: I have not the slightest sympathy with his ideas; they seem to be either misinterpretations of evolutionary teachings or simply undeveloped thoughts. But choice A is inappropriate because the idea is not amorphous or indeterminate (The idea that the speaker is mentioning is not nonsense at all, but fact). So choice A is not the correct answer.
Option B: It is most extraordinary that these ideas (that I am going to discuss) never occurred to him, for he was an eminent man of science before writing his probably insane books. But choice B is besides the point and is not an answer to the question
Option C: ... tell you about any remarkable thoughts at this moment engaging the attention of western philosophers and men of science – partly because without a knowledge of them you might form incorrect ideas in relation to a philosophic character's utterances. But a specific philosopher's name, that of Nietzche, is not brought into the lecture by the speaker for this reason. Hence choice C is not the answer.
Option D: I am not going to discourse about Nietzche, though the title of this lecture is taken from one of his books. You will not find the ideas that I will discuss in his books. ..... But the title of one of his books, and the **idea which he tries always unsuccessfully to explain**, that of a state above mankind, a moral condition "beyond man", is worth talking about. It is not nonsense at all, but fact. Choice D is the answer. Choice (D)

40. Refer to para 1. Leaving Nietzsche alone, let us ask if it is possible to suppose such a state? A state above mankind, a moral condition "beyond man", that is worth talking about? It is not only possible but has also been predicted by thinkers like Herbert Spencer. ...
From para 2 onwards, the speaker poses a series of questions beginning with: Could a world exist in which the nature of all inhabitants would be so moral that the mere idea of what is immoral could not exist?
Option C: The speaker attempts to answer such questions in the third para: Does such a world in which morality would have been transmitted into inherited instinct exist? You may answer – In heaven and nowhere else. But the world of insects actually furnishes examples of such moral transformation. Writers such as Sir John Lubbock and Herbert Spencer say that certain kinds of social insects have immensely surpassed men, both in social and in ethical progress. So we can say that in the world of insects, morality has been transmitted into inherited instinct. So choices A and B are rendered incorrect. Choice C is the answer.
Option A & B: Choices A and B are incorrect. Can we suppose such a state? It is not only possible but has also been predicted by thinkers like Herbert Spencer. ... In the world of which I am speaking, no time would be wasted in such education, for every child would be born with full knowledge of what is right and wrong. You may ask if such a state is possible? You may answer – In heaven and nowhere else. But it currently exists in the world of insects.
Option D: Choice D is not the answer. With us, unfortunately, what is wrong often gives pleasure; and what is good to do, commonly causes pain. But in the world which I am asking you to all the pleasure would be in right-doing. Such a human world does not currently exist.
Choice (C)

Difficulty level wise summary - Section I	
Level of Difficulty	Questions
Very Easy	–
Easy	5, 6, 27, 29, 30, 40
Medium	4, 7, 8, 9, 10, 11, 14, 20, 21, 22, 25, 28, 32, 35, 36, 37, 38, 39
Difficult	12, 13, 15, 16, 17, 18, 19, 23, 26, 31
Very Difficult	1, 2, 3, 24, 33, 34

SECTION – II

Solutions for questions 1 to 5:

1. For the combination of clothes that Suraj wore, he can secure three modelling contracts, i.e., from B, I and J.
Choice (C)

2. Since the colours of four pieces of clothing are fixed, we can eliminate all the designers where their preference for each of these pieces of clothing does not match with the colours worn by Suraj (since they can have a maximum of only two pieces of clothing matching with Suraj's). We can see that Suraj cannot secure a contract with A, E, G and K.
Further, he will definitely secure a contract with D since three of the four pieces of clothing that Suraj wore matches with the preferences of D.
The designers with which only one piece of clothing matched are B, C, F, I and J.
The designers with which two pieces of clothing matched are H and L.
If he wants to secure a contract with B, he must wear Blue Blazer and Black Shoes. But he will secure only one additional contract. If he wants to secure a contract with C, he must wear a Grey Blazer and Pink Shoes. In this case, he will secure a contract with C, H and L.
We can check for the other cases and we can see that the highest will be if he wears a Grey Blazer and Pink Shoes.
Choice (D)

3. Suraj wore a Blue Shirt, a Grey Blazer and Black Shoes. None of these matches with the preference for D. Hence, Suraj must have worn the other three pieces of clothing according to D's preference, i.e., Yellow tie, Grey Trousers and Brown Socks. The number of modelling contracts that he can secure with this attire is 3 (with D, C and J).
Choice (B)

4. With the given combination of colours, Suraj will not secure any modelling contracts. Choice (A)

5. For Suraj to secure modelling contracts wearing same colour for all pieces of clothing, that colour must appear in at least three pieces of clothing. We can see that the colours Blue, Black, Brown, Grey and Red appear in at least three pieces of clothing, while Yellow, Orange and Pink appear only in two.
Hence, we can check the first five colours only. For Blue, he will secure modelling contracts with K.
For Black, he will secure modelling contracts with A. For Brown, he will secure modelling contracts with D and I. For Red, he will secure modelling contracts with no one.
Hence, he can secure a maximum of 2 contracts.
Choice (C)

Solutions for questions 6 to 10:

6. The populations (in mn) of the states A, B, C, D, E, F and G are 59, 45.6, 62.7, 71.3, 55.7, 63.6 and 60.1 respectively.
The total population of the country = 418 mn
The states which have less than 15% of the country's population, i.e., which have less than 0.15 × 418 = 62.7 mn, are A, B, E and G. Ans: (4)

7. The total number of males in the country = 222.2
The total number of females = 195.8
Ratio of the number of females in the country to that of males = 0.8812
We can see that for A and E, the ratio is greater than 1.
For C, the ratio is more than 0.9. For all the other states, the ratio is less than 0.88.
Hence, the answer is 3. Ans: (3)

8. Number of illiterates in state A = 0.4 × 26.5 + 0.6 × 32.5 = 30.1
Number of illiterates in state B = 0.4 × 25.1 + 0.6 × 20.5 = 22.34
Number of illiterates in state C = 0.4 × 32.5 + 0.6 × 30.2 = 31.12
Number of illiterates in state D = 0.4 × 38.5 + 0.6 × 32.8 = 35.08
Number of illiterates in state E = 0.4 × 24.5 + 0.6 × 31.2 = 28.52
Number of illiterates in state F = 0.4 × 38.7 + 0.6 × 24.9 = 30.42
Number of illiterates in state G = 0.4 × 36.4 + 0.6 × 23.7 = 28.78
Hence, the third highest number of illiterates are in state F.
Choice (D)

9. In state A, since there are 26.5 mn males and 32.5 mn females, there can be a maximum of 26.5 mn married couples, i.e., a total of 53 mn married persons. Hence, the remaining 6 mn persons will be unmarried. This is the minimum number of persons who will be unmarried.
Similarly, in state B, a minimum of 45.6 – 20.5 × 2 = 4.6 mn persons will be unmarried.
In states C, D, E, F and G, the number of unmarried persons in the state will be at least 2.3 mn, 5.7 mn, 6.7 mn, 13.8 mn and 12.7 mn.
Comparing this with the population of each state, we can see that only in state C and state D, the number of unmarried persons can be at most 10% of the population.
Hence, only two states can satisfy the given condition.
Ans: (2)

10. Total number of males in the country = 222.2 mn
15.46% of 222.2 = 35.35212 mn. All the states in which the number of males is less than this will satisfy the given condition. Four states (i.e., A, B, C and E) satisfy the given condition. Ans: (4)

Solutions for questions 11 to 15:

Given that Akbar and Barry are at the same level. They can be at first or second level. Also, they are not at the same level as Chand. Dhruv is also not at the same level as Chand. Since Himesh is standing at the top (from (ii)), Dhruv, Akbar and Barry must be at the first level and Chand and Gaurav must be at the second level.

From (iii), weight of Dhruv is 100 kg. From (v), the total weight of Chand, Gaurav and Himesh must be 210 kg. This is possible in two ways. They can weigh 50 kg, 70 kg and 90 kg or 60 kg, 70 kg and 80 kg. If they weigh 50 kg, 70 kg and 90 kg, then one among Himesh and Gaurav must weigh 90 kg (since Chand has a lower weight than Gaurav). In this case, Barry cannot have a weight greater than Himesh and Gaurav.

Hence, the weights of Chand, Gaurav and Himesh must be 60 kg, 70 kg and 80 kg in any order. From (iii), Barry must weigh 90 kg. Hence, Akbar must weigh 50 kg. Therefore, Gaurav's weight must be 70 kg. Chand must weigh 60 kg and Himesh, 80 kg.

11. Gaurav is standing at the second level. Choice (D)

12. Himesh weighs 80 kg. Choice (C)

13. Akbar weighs only 50 kg. Choice (A)

14. Only Akbar supports a weight greater than his weight (70 kg and 50 kg respectively). Choice (B)

15. For Akbar, Barry and Chand, the difference is 20 kg which is the minimum. Choice (B)

Solutions for questions 16 to 20:

The mileages of Raghav's car from July 2nd till July 15th are 13.75, 13.25, 13, 13.5, 14, 14.75, 15, 14.75, 15.25, 15.5, 15, 15.25, 15.5 and 15.25 respectively.
The mileages of Raman's car from July 2nd till July 15th are 14.75, 15.25, 14.5, 13.75, 14.25, 14.75, 14.5, 14, 14.5, 15.25, 15.5, 15.25, 15.5 and 15 respectively.

16. The maximum mileage that any car gave on any day was 15.5 kmpl. Choice (B)

17. Raghav's car gave a better mileage than Raman's car on five days (on 8th, 9th, 10th, 11th and 15th).
Choice (C)

18. Since the mileages of both the cars are in the range of 13 to 15.5, for the mileage to increase by 5%, it must increase by at least 0.65 and at most 0.775. In the graph, the only values above 0.65 are the ones at 0.75. Hence, we need to check for only those days when the mileage increased by 0.75.
The mileage of Raghav's car increased by 0.75 on 2nd and 7th as compared to the previous day, and on the previous days, the mileage was less than 15. Hence, on these two days, the mileage of Raghav's car increased by more than 5%. Similarly, the mileage of Raman's car increase by more than 5% on 11th.
Hence, the mileage of at least one car increased by more than 5% on three days. Choice (A)

19. The distance travelled by Raghav's car on July 1st = 2 × 13 km
Similarly, we can find the distance travelled by Raghav's car on each day.
The total distance travelled by Raghav's car = 2 × (13 + 13.75 + 13.25 + 13 + 13.5 + 14 + 14.75 + 15 + 14.75 + 15.25 + 15.5 + 15 + 15.25 + 15.5 + 15.25) = 433.5 km
The total distance travelled by Raman's car = 2 × 221.75 = 443.5 km Choice (D)

20. Given that Raman's car and Raghav's car travelled the same distance on each day. Let this distance be x.
Total fuel consumed by Raghav's car during the given period = $\frac{x}{15.5}+\frac{x}{15}+\frac{x}{15.25}+\frac{x}{15.5}+\frac{x}{15.25}$
Total fuel consumed by Raman's car during the given period = $\frac{x}{15.25}+\frac{x}{15.5}+\frac{x}{15.25}+\frac{x}{15.5}+\frac{x}{15}$
We can see that the total fuel consumed by the two cars is the same. Hence, the required ratio is 1.
Choice (D)

Solutions for questions 21 to 25:

From (ii), Qureshi subscribes to Rogue. From (iv), Tim subscribes to a Fortnightly magazine.

From (v), Men is a monthly magazine. Pavan does not subscribe to it since Pavan does subscribe to a monthly magazine. Qureshi does not subscribe to it since he subscribes to Rogue. From (v), Rajesh does not subscribe to it. Tim does not subscribe to it since he subscribes to a fortnightly magazine. Hence, Sravan must subscribe to Men.

From (iii), since Sravan subscribes to a Monthly magazine, Rajesh must subscribe to a Quarterly magazine. Since Qureshi does not subscribe to a Weekly magazine, Pavan must be subscribing to the Weekly magazine. Qureshi must be subscribing to the Daily magazine.

From (iv) and (vi), Tim does not subscribe to Comicdust or Reader. Hence, Tim subscribes to Filmware. Form (i), Pavan does not subscribe to Reader. Hence, Rajesh subscribes to Reader and Pavan subscribes to Comicdust.

The following table provides the magazines and the type of magazines that the five friends subscribe to:

Person	Magazine	Frequency
Pavan	Comicdust	Weekly
Qureshi	Rogue	Daily
Rajesh	Reader	Quarterly
Sravan	Men	Monthly
Tim	Filmware	Fortnightly

21. Pavan subscribes to Comicdust. Choice (B)

22. Reader is a Quarterly magazine. Choice (D)

23. Qureshi will receive more number of magazines in a month as compared to Pavan. Choice (A)

24. Sravan subscribes to a Monthly magazine.
Choice (B)

25. Sravan subscribes to Men. Choice (D)

Solutions for questions 26 to 30:

26. Ranjit can send the convoy in the following ways (left to right indicates front to back): (C, C, J, J), (C, J, J, C), (C, J, C, J), (J, J, C, C), (J, C, C, J), (J, C, J, C). The length of the convoy in each case will be 45, 50, 55, 55, 60 and 65 respectively. Hence, the length of the convoy will be the minimum of these values, i.e., 45. Choice (B)

27. For the given vehicles, there are two combinations for which the distance between vehicles is 10 ft., i.e., (J, J) and (V, J).
There is one combination for which the distance is 15 ft. which is (J, V).
There are three combinations for which the distance is 20 ft., i.e., (T, J), (V, T), (V, V).
For the other combinations, the distance is 25 ft.
Since there are five vehicles, the length of the convoy will depend on four values (distances between adjacent vehicles).
All the four values cannot be 10 (since it is not possible to have trucks in the convoy for 10 ft distance).
At least one value must be 20, since the minimum distance for a truck is 20.
It is not possible to have three 10s in the convoy with two vans and two jeeps.
Hence, there must be two 10s.
We can try for a combination with two 10s, one 15 and one 20. If a convoy with this combination of distances is possible, then that will be the minimum length of the convoy.
Two 10s are possible if the convoy has (V, J, J). To have a 15 in this, we can have (V, J, J, V). The truck can be added to the end of the convoy, i.e., the convoy will be (V, J, J, V, T). Hence, the minimum length of the convoy will be 10 + 10 + 15 + 20 = 55. There will be four vehicles in front of the truck. Choice (D)

28. Let the other vehicle be X. Along with a Truck, the following combinations will result in distinct lengths of the convoy: (T, X, X, X); (X, T, X, X); (X, X, X, T). (the combination (X, X, T, X) will have the same length as (X, T, X, X)).
Let X be Car. The lengths of convoys for the three combinations in that order will be 15 + 20 + 20 = 55, 25 + 15 + 20 = 60, 20 + 20 + 25 = 65. Hence, the minimum length of convoy will be 55 ft. Therefore, the other vehicle cannot be Car.
Let X be Jeep. The lengths of convoys for the three combinations are 40, 55, 45. Hence, the length of convoy if the other vehicle was Jeep is 40 ft. Hence, X cannot be Jeep.
Let X be Van. The lengths of convoys for the three combinations are 65, 65, 60. If the three vehicles were Vans, the length of the convoy will be 60 ft. Hence, X is Van. Choice (C)

29. Since there are four vehicles, we need three values. The lowest three values from the table are (ignoring the values along the diagonal since there is only one vehicle of each type) 10, 15, 15. If we can find an order of convoys for which this is the length of the convoy, then this will be the minimum possible length of the convoy.
Since there is a 10, Van must be in front of Jeep.
15 ft is possible for the following combinations: (C, J), (J, V), (T, C). But it is not possible to form a convoy combining these with (V, J) (for 10 ft). The next lowest numbers, i.e.,

15, 15, 15, which is possible if the convoy is in the order (T, C, J, V). Hence, the length of the convoy will be 45 ft.
Choice (B)

30. As we observed in the previous problem, there will only be three combinations for which the length is distinct. Extending that to five vehicles in the convoy with a Jeep, we will get three combinations: (J, X, X, X, X), (X, J, X, X, X), (X, X, X, X, J).
If X is car, the convoy with minimum length will be (C, C, C, C, J) with 75 ft.
If X is Truck, the convoy with minimum length will be either (T, J, T, T, T) OR (T, T, T, T, J) both with lengths of 95 ft.
If X is Van, the convoy with minimum length will be (V, J, V, V, V) with length of 65 ft.
The maximum number of vehicles that be behind the Jeep is 3 (since in none of the cases, the Jeep was at the front of the convoy). Choice (C)

Solutions for questions 31 to 35:

Let A, T, S, B, H, P and L represent the six friends (indicated by the first letter of their names).

Since 2 is a prime, on Jan 2nd, he will call them in the following order – PLATSBH.

Since 3 is also prime, he will them in the following order on Jan 3rd – BHPLATS.

On 4th, he will them in the order – SBHPLAT.

Since the order can be determined by the person that he calls first, we can just notice the first person that he calls and the date.

From 5th to 31st, the first person he will call will be A, L, P, H, B, S, A, L, P, H, B, S, A, L, P, H, B, S, A, L, P, H, B, S, A, L, P.

31. On four days, Raj will call Hari first. Choice (B)

32. Raj will call Piyush first on six days. Choice (D)

33. On all the days that Piyush is not last, this condition is satisfied. Piyush will be last when Lokesh is first. Hence, Lokesh is first on five days. On the remaining 26 days, Raj will call Lokesh immediately after he calls Piyush.
Choice (B)

34. Lokesh will be the third person that Raj calls when Hari is the first person that Raj calls. Among the give options, Raj callsHari first on Jan 20th. Choice (A)

35. On January, Raj will not call Tarak first. On Feb 4th, he will call Tarak first. Choice (C)

Solutions for questions 36 to 40:

Let Manish select Toda from the first group. If he selects Toda, he can select Hausa or Amharic from Afro-Asiatic languages. In either case, he cannot select Catalan (from (iv)). If he selects Hausa, he can select either Latin or Romanian, i.e., 2 ways. If he selects Amharic from the Afro-Asiatic languages, he cannot select Latin from Romance languages (from (v)). He must select Romanian, i.e., 1 way.

Let Manish select Tulu from Dravidian languages. If he selects Catalan from Romantic languages, he can select any of the three languages from Afro-Asiatic languages, i.e., 3 ways. If he selects Romanian, he must select Amharic (from (iii)), i.e., 1 way. If he selects Latin, he can select Hausa or Oromo, i.e., 2 ways.

Let Manish select Gondi from Dravidian languages. He cannot select Catalan from the Romantic languages (from (ii)). He also cannot select Hausa (from (ii)). If he selects Romanian, he can select Amharic or Oromo, i.e., 2 ways. If he selects Latin, he must select Oromo, i.e., 1 way.

36. Manish can select the three languages in 12 ways.
Ans: (12)

37. If Manish selects Hausa, he can select the other languages in 4 ways: (Toda, Latin), (Toda, Romanian), (Tulu, Catalan), (Tulu, Latin). Ans: (4)

38. If Manish selects Amharic and not Romanian, he can select the other two languages in one way, (Tulu, Catalan).
If he selects Romanian and not Amharic, he can select the other two languages in two ways, (Toda, Hausa), (Gondi, Oromo).
Hence, he can select the languages in 3 ways.
Ans: (3)

39. If Manish selects Tulu but not Catalan, he can select the other two languages in 5 ways, (Catalan, Hausa), (Catalan, Amharic), (Catalan, Oromo), (Latin, Hausa), (Latin, Oromo).
Ans: (5)

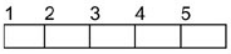
40. If Manish wants to select Latin, he can select the other languages in 4 ways, (Toda, Hausa), (Tulu, Hausa), (Tulu, Oromo), (Gondi, Oromo). Ans: (4)

Difficulty level wise summary - Section II	
Level of Difficulty	Questions
Very Easy	–
Easy	6, 7, 10, 16, 17, 21, 22, 23, 24, 25
Medium	1, 3, 4, 8, 9, 18, 19, 20, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40
Difficult	2, 5, 11, 12, 13, 14, 15, 26, 27, 28, 29, 30
Very Difficult	–

SECTION – III

Solutions for questions 1 and 2:

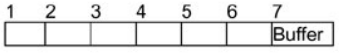
1. We need to find $N_5^5 - N_4^5$, that is (All the numbers with at most five digits and sum of digits as at most 5) – (All the numbers with at most five digits and sum of digits as at most 4). This is simply the number of numbers and with at most five digits and sum of digits as exactly 5. To find this, consider the five boxes shown below, representing five digits.



Now consider five identical balls to be in these boxes, such that number of balls is equal to the digit in that place.

For example, if the first three boxes have no balls, then it would result in a 2-digit number whose digits add up to five.
The total number of natural numbers having at most five digits and sum of digits as exactly five is equal to the number of ways of distributing 5 identical balls in the 5 places
$= {}^{5+5-1}C_{5-1} = {}^{9}C_4 = 126.$ Ans: (126)

2. We need to find the number of numbers with at most six digits and sum of digits as at most 5. To find this, consider the seven boxes shown below representing six digits and one buffer box.



Now consider five identical balls to be distributed in these seven boxes, such that the number of balls in each of the first six boxes is equal to the digit in that place.
For example, if the 2nd box has two balls in it, then the digit 2 is assumed in that place.

Now, the sum of the digits of the seven places is always 5, but the sum of the places from 1 to 6 can vary from 0 to 5 (depending on the digit or the number of balls in the buffer box)
Thus, the number of natural numbers with at most six digits and the sum of digits as at most five is simply the number of ways of distributing 5 identical balls in these seven places –1 (for the case when all five balls are in the buffer box)
$= {}^{(7+5-1)}C_{(7-1)} - 1 = {}^{11}C_6 - 1 = 461.$

Ans: (461)

Solutions for question 3:

3. Since they are running in the same direction with their speeds in the ratio n : 1, (and n is a natural number) they meet at $(n-1)$ distinct points. (At $\frac{L}{n-1}, \frac{2L}{n-1}, \frac{3L}{n-1}$ .....L, where L is the length of the track.) They meet at each of these points once every $(n-1)$ times that they meet.
So, $(n-1)$ has to be a factor of the difference (17 – 5) or 12. Except for $n = 6$, for all other values of n, this is true.

Choice (D)

Solutions for question 4:

4. Consider $13 \times 5 = 65 = 2^6 + 1$

First, find the remainder of $\frac{2^{1500}}{65} = \frac{(2^6)^{250}}{2^6+1}$, the remainder of which is $(-1)^{250} = 1$
Since the remainder of 2^{1500}, when divided by 65 (which is a multiple of 13, is 1), the remainder when 2^{1500} is divided by 13 will also be 1.

Alternative Solution:

Since, 2 and 13 are co-primes we can apply 'Little Fermat's theorem'

i.e., $\text{Rem}\left[\frac{a^{p-1}}{p}\right] = 1$ where a, p are co-primes.

$\Rightarrow \text{Rem}\left[\frac{2^{13-1}}{13}\right] = \text{Rem}\left[\frac{2^{12}}{13}\right] = 1.$

$$\text{Rem}\left[\frac{N}{13}\right] = \left[\frac{2^{1500}}{13}\right] = \left[\frac{\left(2^{12}\right)^{125}}{13}\right] = 1$$

Ans: (1)

Solutions for questions 5 to 15:

5. $17\log_{30}x - 3(\log_x 5 + \log_x 6) + 20(\log_x 10 + \log_x 3)$
$17\log_{30}x - 3\log_x 30 + 20\log_x 30$
$= 17\log_{30}x + 17\log_x 30$
$= 17(\log_{30}x + \log_x 30)$
Since $x > 1$, $\log_{30}x > 1$
$\Rightarrow \log_{30}x + \log_{30}x \geq 2$
$\therefore$ Minimum value of the given expression is $17 \times 2 = 34$.

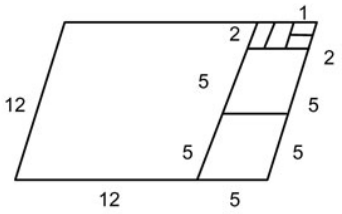
Choice (B)

6. Let the numbers of senior lecturers and junior lecturers be s and j respectively.

Using alligation, $\frac{j}{s} = \frac{250-160}{160-100} = \frac{3}{2}$

$\therefore$ 60% of the lecturers were juniors. Choice (B)

7.



A parallelogram whose angles are 60^0 and 120^0 and for which the ratio of the sides is a rational number, can be perfectly split into equilateral triangles. First we split up the parallelogram into smaller parallelograms, in which the length is k times the breath (where k is a positive integer). For each such parallelogram there are k such parallelograms whose length and breadth are equal and for each of these k parallelograms, there are 2 equilateral triangles. Thus, the number of equilateral triangles into which the parallelogram can be perfectly out is given by

$N = 2\left(\left[\frac{17}{12}\right] + \left[\frac{12}{5}\right] + \left[\frac{5}{2}\right] + \left[\frac{2}{1}\right]\right)$

Where $\left[\frac{p}{q}\right]$ is the greatest integer less then or equal to p/q. In the expression above, the numerator of each term (from the second onwards) is the denominator of the previous term and the denominator is the remainder obtained in the division indicated in the previous term.
$\therefore N = 2(1 + 2 + 2 + 2) = 14$ Choice (C)

8. Let the cost of a burger, a pastry and a pizza be ₹x, ₹y and ₹z respectively.
Bill amount of Ram: $3x + 4y + 2z = 1050$ ..... (1)
Bill amount of Shyam : $2x + y + 3z = 950$ ..... (2)
Multiplying equation (1) with 2 and equation (2) with 3 and solving them to eliminate x, we get $5z - 5y = 750$ or $z - y = 150$ i.e., pizza costs ₹150 more than a pastry.
Hence Shyam owes Ram a sum of ₹150. Choice (A)

9. Let the earnings of Achyut be ₹100. Then his savings will be ₹30. Ranjit's savings will be 150% of ₹30, i.e., ₹45. If Ranjit's earnings are ₹45, then the least value of the sum of their earnings = ₹145.
Hence, the percentage mentioned will be a minimum of 145%. Choice (C)

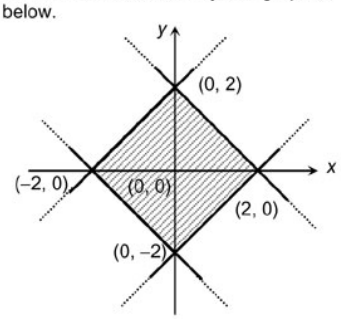
10. The total work to be done is $2N^2$ mandays (md). On the first day $(2N - 1)$ md is done on the second $2N - 2$ md is done and so on.
On the $(2N-1)^{th}$ day 1 md is done
$\therefore$ The total work completed in $2N - 1$ days is $(2N - 1)(2N)/2 = N(2N - 1) = 2N^2 - N$
So, the work is not completed at the end of $(2N - 1)$ days and $2N^2 - (2N^2 - N)$, i.e., N mandays of work is left. This is completed by the person, who could not join the group at the beginning, in N days. So, the work took a total of $(2N - 1) + N$ i.e. $(3N - 1)$ days.

Alternative solution:
Since $N > 5$, assume $N = 6$. Hence, total mandays of work $= 2N \times N = 72$. First 11 days we have $(11 + 10 + 9 + \ldots\ldots + 2 + 1) = 66$ mandays of work. The first person alone will work for another $72 - 66 = 6$ days. Hence, total days taken $= 11 + 6 = 17$ i.e., $3N - 1$ days. Choice (B)

11. Any quadratic function with roots as 7 and –3 can be represented as $f(x) = k(x - 7)(x + 3)$
$= k(x^2 - 4x - 21)$
$= k((x-2)^2 - 25)$
given $f(6) = -18 \Rightarrow k((6-2)^2 - 25)$
$= -18$
$\Rightarrow -9k = -18 \Rightarrow k = 2$
$\therefore f(x) = 2(x-2)^2 - 50$

Clearly as the value of x moves away from 2, f(x) increases.
∴ f(x) attains a minimum at x = 2 Choice (C)

12. Consider the area enclosed by the graph of $|x| + |y| = 2$, given below.



The area of the shaded region will be $\left(\frac{\text{The product of the diagonals}}{2}\right) = \frac{4\times4}{2}$ = 8 sq.units

This graph can be shifted in the coordinate plane (without changing its size and shape), from the origin as its centre, to any point (a, b) as its centre.
Then the new (shifted) graph will be $|x - a| + |y - b| = 2$
[Note: The area enclosed by such a graph is independent of the values of a and b].
Hence, the area enclosed by the graph $|x - 1| + |y - 1| = 2$ is also 8 sq.units. Choice (D)

13. The circle will be the smallest when the triangle is equilateral.

$\Rightarrow \frac{\sqrt{3}}{4}a^2 = 3\sqrt{3}$ sq.cm

$\Rightarrow a = 2\sqrt{3}$ cm.

$\therefore$ Circumradius $= \frac{2}{3}\times\frac{\sqrt{3}}{2}\times a$

r = 2 cm.
∴ Area of circumcircle $= \pi r^2 = 4\pi$ sq.cm

Choice (B)

14. $S = 1+\frac{1}{2}+\frac{1}{3}+.....+\frac{1}{2^{32}}$

$$\therefore S = \underbrace{(1)}_{T_0}+\underbrace{\left(\frac{1}{2}\right)}_{T_1}+\underbrace{\left(\frac{1}{3}+\frac{1}{4}\right)}_{T_2}+\underbrace{\left(\frac{1}{5}+\frac{1}{6}+\frac{1}{7}+\frac{1}{8}\right)}_{T_3}+.....$$

$$+\underbrace{\left(\frac{1}{2^{31}+1}+\frac{1}{2^{31}+2}+.....+\frac{1}{2^{32}}\right)}_{T_{32}}$$

Each term from T_2 onwards in the above series will be greater than the preceding term and also lie between $\frac{1}{2}$ and 1.

$$\Rightarrow \left[1+\frac{1}{2}+(32-1)\frac{1}{2}\right] < S < \left[1+\frac{1}{2}+(32-1)1\right]$$

i.e., S is greater than 17 and less than $32\frac{1}{2}$.

Choice (C)

15. As N should take a value between 400 and 999, N must be a three-digit number. Also, as the coins are equally distributed between three children, N should be a multiple of 3. Let N be abc. Hence, N = 100a + 10b + c
The number formed by reversing the digits of N will be cba = 100c + 10 b + a.
Sum of the two numbers = 101 (a + c) + 20b. The units digit of the sum will be the units digit of (a + c).
As the units digit of the sum is 9, (a + c) can be 9, 19, 29 ... However, as both a and c are single-digit numbers, (a + c) can have a maximum value of 18. Thus a + c must be 9.
Thus the required numbers are 4b5, 5b4, 6b3, 7b2, 8b1 and 9b0. As the number is a multiple of 3, b can take only the values 0, 3, 6 and 9. Thus the total number of values N can assume is $6 \times 4 = 24$ Choice (C)

Solutions for questions 16 and 17:

Given the employees are either JSE or SSE and they belong to exactly one area between Testing and Programming.

Also given, female SSE's = males in Testing = 200
The ratio of males in Programming to female JSE's is 3 : 2
Let males in Programming be 3x then female JSE's are 2x
Total number of employees = 700

Now $2x + 200 + 3x + 200 = 700 \Rightarrow 5x = 300 \Rightarrow x = 60$
∴The number of female JSE's = 120 and Males in Programming = 180

Hence the final table is as follows:

	JSE	SSE	Testing	Programming	Total
Male			200	180	380
Female	120	200			320
					700

16. The number of males in the company = 380.
Choice (B)

17. Total employees in Testing = 300
Females in Testing = 100
∴The number of females in Programming = 320 – 100 = 220 Choice (C)

Solutions for questions 18 to 20:

18. Let us number the spider's legs from 1 to 10, and let P_k and Q_k denote the sock and shoe that will go on the k^{th} leg. There are 20! permutations of the twenty symbols and Q_1 precedes P_1 in exactly half of these, i.e., $\frac{20!}{2}$ permutations.

Continuing this way, we can conclude that each Q precedes the corresponding P in exactly $\frac{20!}{2^{10}}$ or $\frac{5.19!}{2^8}$ permutations.

Alternative Solution:
We can analyze the situation more easily by imagining twenty boxes B_1 through B_{20}, such that the ten socks, s_1 through s_{10}, and the ten shoes, h_1 through h_{10}, are placed one each in each of the boxes. We can assume that each possible way in which this can be done corresponds to an order in which the spider wears the socks and shoes (the item – shoe or sock – in the first box worn first, the item in the second box worn second and so on.)
This arrangement must satisfy the condition that s_i is always in a box numbered less than h_i.
In order to do this arrangement, we can start by considering one set of sock and shoe, say s_1 and h_1, and select any two of the twenty boxes to put them in.
The number ways of selecting two boxes out of twenty $= {}^{20}C_2$.
After selecting the boxes, there is only one order in which s_1 and h_1 can be placed in the two boxes, i.e., s_1 must be placed in the lower numbered box.
Now consider another set, say s_2 and h_2.
This set can be similarly arranged in ${}^{18}C_2$ ways (only 18 empty boxes are now available).
Proceeding in this manner, all the ten sets (i.e., the 20 items) can be arranged in ${}^{20}C_2 \times {}^{18}C_2 \times {}^{16}C_2 \times ..... {}^{4}C_2 \times {}^{2}C_2$ ways

$$= \left(\frac{20\times19}{2}\right)\left(\frac{18\times17}{2}\right)\left(\frac{16\times14}{2}\right)\ldots\ldots\left(\frac{4\times3}{2}\right)\left(\frac{2\times1}{2}\right)$$

$$= \frac{20!}{2^{10}} = \frac{5.19!}{2^8}$$ Choice (A)

19. Add 2 to all three terms, they become $\frac{y+z-x}{x}+2$, $\frac{x+z-y}{y}+2$ and $\frac{x+y-z}{z}+2$ respectively.

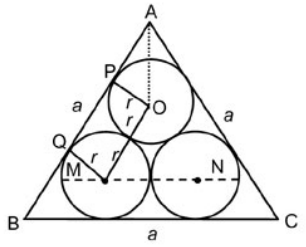
i.e. $\frac{x+y+z}{x}$, $\frac{x+y+z}{y}$ and $\frac{x+y+z}{z}$ respectively.

These resultant terms are in A.P.

So $\frac{1}{x}, \frac{1}{y}, \frac{1}{z}$ are also in A.P.

Choice (C)

20.



Consider MN = $4r$ < BC $\Rightarrow r < \frac{a}{4}$. Hence, we need to look for the choice were the denominator is greater than 4. Only choice (A) is possible.

Alternative solution:
Let the radius of the circle be r.
In the figure given above, PQ = $2r$

In ΔAPO, $\tan\angle PAO = \tan30° = \frac{r}{AP} = \frac{1}{\sqrt{3}}$

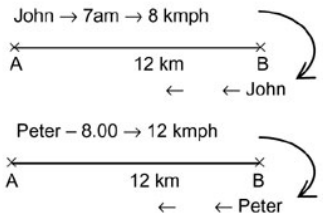
$\Rightarrow AP = \sqrt{3}r$

Similarly, $BQ = \sqrt{3}r$

$\therefore a = \sqrt{3}r + 2r + \sqrt{3}r \Rightarrow r = \frac{a}{2(\sqrt{3}+1)}$

Choice (A)

Solutions for questions 21 and 22:



21. John starts earlier than Peter by one hour.
John takes (12/8) = 1.5 hr to reach B.
$\Rightarrow$ John is at B, at 7.00 + 1.30 = 8.30a.m. ----- (1)
Peter starts at 8am from A and takes (12/12) = 1 hour, to reach B. Peter is at B at 8.00 a.m. + 1.00
= 9.00 a.m.----- (2)
The above implies that John and Peter will meet for the first time, when John is returning to A and Peter is proceeding to B.
Hence, consider their positions at 8.30 a.m.
At 8.30 John is at B
At 8.30, Peter is at a distance of
(30 minutes) × (12 kmph) = 6 km
From A
Hence, distance between them than is 12 – 6 = 6 km
Time taken, measured from 8.30 a.m. to meet for the first time = 6/(12+8) = (3/10)hrs = 18 minutes
$\Rightarrow$ they meet at 8.30 + 0.18 = 8.48 a.m.
Choice (B)

22. John turns back towards A at 8.30 a.m. Peter turns back towards A at 9.00 A.
The position of John at 9.00 a.m.
(1/2 hr) × 8 kmph = 4km, from B, hence time taken for the second meeting (counted from 9.00 a.m.) is
= (4 km)/(12-8) kmph = 1 hr
i.e, of 9.00 + 1.00 = 10.00a.m.
At 10.00a.m. both John and Peter meet at the starting point A. Choice (D)

Solutions for question 23:

23. Since x_1, x_2, x_3 and x_4 are all real, the discriminants of both the quadratic equations should be non-negative.
Hence $k \geq 2\sqrt{35}$, i.e. $\equiv$ 11.83 and also $k \leq 12.25$
Since k is a natural number, k = 12.
Ans: (12)

Solutions for question 24:

24. Let the two numbers be ha and hb, where h is the HCF of the two numbers.
Given, LCM = hab = 315
$315 = 3^2 \times 5 \times 7$
$\because$ HCF is a prime greater than 3, it has to be 5 or 7.
If h = 5, then a = 63, b = 1
OR a = 9, b = 7
$\therefore$ Sum of the numbers can be $63 \times 5 + 1 \times 5 = 320$ OR $9 \times 5 + 7 \times 5 = 80$
If h = 7, then a = 45, b = 1
OR a = 9, b = 5
$\therefore$ The sum of the two numbers can be $45 \times 7 + 1 \times 7 = 322$
OR $9 \times 7 + 5 \times 7 = 98$
Among the options, only option (D) is not possible.
Choice (D)

Solutions for questions 25 to 27:

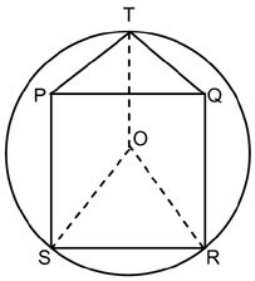
25. MMCMXCIX
= 1000 + 1000 + (1000 – 100) + (100 – 10) + (10 – 1)
= 2999 Choice (D)

26. MMLXLV = 1000 + 1000 + 50 + (50 – 10) + 5 = 2095
MMXCV = 1000 + 1000 + (100 – 10) + 5 = 2095
MMVC = 1000 + 1000 + (100 – 5) = 2095
MMCCV = 1000 + 1000 + 100 + 100 + 5 = 2205
Hence, (a), (b) and (c) are equal to 2095
Choice (D)

27. MMCCVC = 1000 + 1000 + 100 + 100 + (100 – 5) = 2295
MMMCCL = 1000 + 1000 + 1000 + 100 + 100 + 50 = 3250
DC$\alpha\beta$V = 3250 – 2295 = 955
If α & β are less than or equal to C(100), the value of numeral would be (805).
$\therefore$ α should be greater 100
The numeral is DCDLV
α = D, β= L
Value of numeral $\beta\alpha$ i.e., LD = (500 – 50) = 450
Choice (C)

Solutions for questions 28 and 29:

28.



In the above diagram let TPSRQ be the pentagon. Let us construct an equilateral triangle SOR and join OT.

OS ∥ PT and OT ∥PS. Thus PSOT is a parallelogram.

⇒ OS = PT and PS = OT

Thus OS = OR = OT.

⇒ O is the centre of the circle with radius OS.

As OS = PT = 5 cm, the radius of the circle is 5 cm.

Choice (A)

29. Let the negative marking per mistake for the first twenty mistakes be n_1 and for all the subsequent mistakes let it be n_2.

A attempted 160 questions and got only 80 correct and B attempted 150 questions and got only 100 correct.

So, $80(1) - 20(n_1) - 60(n_2) = 55$

$100(1) - 20(n_1) - 30(n_2) = 85$

$\Rightarrow 20 + 30n_2 = 30$

$\Rightarrow n_2 = 1/3$ Choice (B)

Solutions for question 30:

30. $(a^b)^c$ = bac25

As the units digit is 5, 'a' must be 5

The powers of five which have five digits are $5^6 = 15625$ and $5^7 = 78125$

In the above two numbers the second digit is 5 only in 5^6, so the number should be 5^6

$(5^b)^c = 15625$

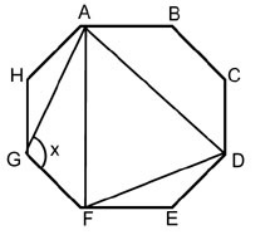
15625 = bac25

b = 1 & c = 6

a + b + c = 5 + 1 + 6 = 12 Ans: (12)

Solutions for question 31:

31. Given ∠AGF = x



Each interior angle of a regular octagon is $180° - \frac{360°}{8} = 135°$.

In ΔGHA, ∠AHG = 135° and AH = HG

$\Rightarrow \angle HGA = \angle HAG = \frac{180° - 135°}{2} = 22.5°$

∴ ∠AGF = ∠HGF – ∠HGA

= 135° – 22.5° = 112.5° = x°.

Since HAFG is a cyclic quadrilateral (they lie on the circumcircle of the octagon),

∠HAF = 180° – ∠HGF = 45°.

Since, ΔHAG is congruent to ΔEFD,

∠FDE = ∠AGH = 22.5°

∴ ∠HAF + ∠FDE = 67.5° = 180° – 112.5° = 180° – x°

Choice (B)

Solutions for question 32:

32. If by adding 12 oranges they can be put into pockets of 8, then definitely by adding 4 (12 – 8) We can put then into packets of 8 without any leftovers.

So statement I is sufficient.

From statement II alone we do not know whether by adding four more oranges, the total becomes a multiple of eight or not. Choice (A)

Solutions for questions 33 to 36:

33. Selling price = $200\left(1 \pm \frac{x}{100}\right) = 300\left(1 - \frac{y}{100}\right)$.

(x indicates profit and $-x$ indicates loss).

Using statement I, $x \geq y$.

If profit is made, $200\left(1 \pm \frac{x}{100}\right) = 300\left(1 - \frac{y}{100}\right)$

i.e $2x + 3y = 100$.

$2x + 3y \geq 2y + 3y$ ie $100 \geq 5y$ ie $y \leq 20$

In order for the selling price to be more than ₹250, $300\left(1 - \frac{y}{100}\right) > 250$ i.e. $y < 16^2/_3$. But as $y \leq 20$, y may or may not be less than $16^2/_3$ satisfied. Selling price may or may not be more than ₹250.

If loss is made, $200\left(1 - \frac{x}{100}\right) = 300\left(1 - \frac{y}{100}\right)$

$3y - 2x = 100$ i.e., $3y = 2x + 100$

$x \geq y \Rightarrow 3y \leq 3x$ i.e., $2x + 100 \leq 3x$ i.e, $x \geq 100$

If $x \geq 100$, selling price will be negative which is not possible. This case is ruled out. I alone is not sufficient.

Using statement II, $x \leq y$.

If profit is made $200\left(1 + \frac{x}{100}\right) = 300\left(1 - \frac{y}{100}\right)$. It can be shown as shown in statement A that this means that $y \geq 20$.

y cannot be less than $16\frac{2}{3}$.

∴ Selling price is not more than ₹250. II alone is sufficient.

Choice (A)

34. From statement I, the only possibility is each of them must get the field with same area.

∴ D gets $\frac{1}{4}$ th the area of the field.

I alone is sufficient.

A	B
C	D

So, from statement II,

From the given relations, we can find the value of D.

Let A + C = 20k

⇒ D = 4k

B = K

II alone is sufficient. Choice (B)

35. From statement I, as the team scored only 74 points in total and all the seven players scored points, the next best score of any player of the team can only be 74 – 5 (one point for each player except Ajay and the next highest scores) – 35 (i.e., Ajay's score) = 34. Hence, Ajay would have scored the highest number of points in his team.

∴ Statement I alone is sufficient.

From statement II, as the team for which Ajay played scored less than 60 points (as they lost and their opponents scored 60 points), the next best scorer in Ajay's team could have scored a maximum of 59 – 32 = 27 points. Hence, Ajay would have scored the highest in his team.
∴ Statement II alone is sufficient. Choice (B)

36. Using statement I alone, the possible values of 'm' and 'n' are
$m = 3, n = 15$
$m = 8, n = 11$
$m = 13, n = 7$
$m = 18, n = 3$
So, statement I alone is not sufficient.
Statement II alone is also not sufficient as m can be equal to n, for eg $m = 53$, $n = 53$ or m can be greater than n, for eg $m = 53$, $n = 52$
Only when $m = 18$ and $n = 3$ is $m^3 > 52n^2$
Combining both the statements, we can definitely rule out cases when m is 3 or 8.
When $m = 13$, $13 \times 13 \times 13 < 52 \times 49$
Since, $13 \times 13 < 4 \times 49$
∴ $m = 18$ and $n = 3$ Choice (C)

Solutions for questions 37 and 38:

37. If C, S are natural numbers C – S = CL/100 is also an integer.
∴C must contain a factor of 100. (∵ L < 100) and L must contain a factor (∵ C < 100)
L can be a multiple of 2 or 5. There are 49 multiples of 2 and 10 odd multiples of 5.
∴Number of different values of L = 49 + 10 = 59.
Ans: (59)

38. Since C is a multiple of 100 and less than 20 it will of the form $2^1 5^0 k / 2^2 5^0 k / 2^0 5^1 k / 2^1 5^1 k$ where k is co-prime with both 2 and 5.
(i) If C is of the form $2^1 5^0 k$ i.e., C = 2/6/14/18 for each of these values only one possible value of S exist.
(ii) If C is of the form $2^2 5^0 k$ ie., C = 4/8/12/16 for each of these values three possible values of S exist.
(iii) If C is of the form $2^0 5^1 k$ ie., C = 5/15 for each of these values four possible values of S exist.
(iv) If C is of the form $2^1 5^1 k$ i.e., C = 10 for this value of C nine possible values of S exist.
∴ The number of ordered pairs of (C, S) that are possible = 4(1) + 4(3) + 2(4) + 1(9) = 33. Ans: (33)

Solutions for questions 39 and 40:

39. If we consider all numbers upto the greatest n-digit number (in base 2), we can consider all numbers to be n-digit numbers (by filling up the initial places with 0s) The total number of digits in these numbers is $n(2^n)$
Half of these are 0's and the other half are 1's, i.e. $n(2^{n-1})$
While the actual number of 0's is less, the number of 1's is exactly $n(2^{n-1})$. The number of 1s is given to be 192.
This exactly corresponds to $n = 6$
∴ N is the greatest 6-digit number (in base 2) i.e., $(111111)_2 = 63$ Ans: (63)

40. If P's binary equivalent ends with one i.e., P is odd then P + 1 is even and its rightmost digit of its binary equivalent is 0 and the one is carried forward to the next place. If number in this place is also one then P + 1 will have 0 in this place and 1 is carried forward and if the number in this place is zero then P + 1 will have 1 in this place and there will no longer be any carry forward.
∴ The number of 1's displayed in (P +1)'s binary equivalent will depend upon the position of the rightmost zero.

For example if P's binary equivalent – 1111.
(P + 1)'s binary equivalent – 10000.
If P's binary equivalent – 11110.
(P + 1)'s binary equivalent – 11111.
If P's binary equivalent – 11101.
(P + 1)'s binary equivalent – 11110.
If P's binary equivalent – 11011.
(P + 1)'s binary equivalent – 11100.
If P's binary equivalent – 10111.
(P + 1)'s binary equivalent – 11000.
∴ The number of possible values of x are 5.
Ans: (5)

Difficulty level wise summary - Section III	
Level of Difficulty	Questions
Very Easy	–
Easy	6, 25, 32
Medium	5, 8, 9, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31, 34, 35, 36
Difficult	3, 4, 7, 10, 33, 37, 38, 39, 40
Very Difficult	1, 2, 14