XAT-2015

EXPLANATORY

ANSWERS

SECTION I: VERBAL AND LOGICAL ABILITY

1. 1 talks about the world of cinema being a strange and baffling (which means 'confusing') one. This links it to R as it mentions why cinema is baffling (fortunes are made and unmade). There is a clear Q-P link as Q mentions that Pundits predict doom while P mentions the viewpoint of the optimists. This should be followed by S as it mentions why some people still believe in the future of cinema (it has its own attractions). The S-6 link is also correct as it mentions that a positive approach is what is needed for cinema. Thus the correct order is 1-R-Q-P-S-6. Hence, [C].

2. In this question, 'disapproval' is referred in social terms and the given terms have to express negative evaluation of an individual or a group in a social context. 'Infantile' means 'relating to infancy' or 'childishly immature'. 'Charlatan' means 'a person who pretends to have more knowledge than he or she possesses' or 'a fake'. 'Imbecile' means 'mentally deficient' or 'an extremely stupid person'. 'Childlike' means 'like a child' and 'awful' means 'extremely bad' or 'terrible'. Thus from all the given options, only 'childlike' is not a term of 'disapproval'. Hence, [D].

3. There is a very clear III-II link as III mentions that the reviewers come close enough to being the effective allies of commercial theatre and II negates the closeness by mentioning that they are not close enough. Thus only [A] and [B] can be considered as the correct options since they have the III-II link in them while [C], [D] and [E] can be negated since that link is absent in these options. IV is a better opening sentence of the paragraph since it introduces the main topic of the paragraph i.e., 'critics'. It is correctly followed by V which reveals the public's perception of critics. This is followed by I since it defines 'critics'. III and II complete the rest of the paragraph. Thus the correct order is IV-V-I-III-II. Hence, [B].

4. According to the paragraph, the Universe was not in existence forever and was created at a particular moment in time. Thus, [A] which mentions that the Universe has a finite existence correctly completes the paragraph. [B] is incorrect, as according to our sense, the Universe is eternal while according to the paragraph, it has a finite beginning and end. Though the second part in [C] is correct according to the passage, 'however' does not complete the sentence meaningfully as it is used to mention a point of view that is different from the one mentioned in the preceding part of the sentence. Since both the parts i.e., the one mentioned in the first part and the last part in [C] have the same idea, 'however' is incorrect and thus [C] can be negated. Nothing has been mentioned about the universe being an intense ball of energy. Thus [D] can also be negated. Since all the previous sentences in the paragraph clearly mention that the Universe was created, [E] can be negated as it mentions that the Universe could not have been created. Hence, [A].

5. The main point of the paragraph is to show how two different mathematical formulations gave rise to modern quantum mechanics. [A] is incorrect since it talks about the beginnings of the two approaches which have already been mentioned as being dissimilar. Thus it is a repetition of the previous sentence. [B] is correct since it mentions how they were synthesized i.e., brought together in the transformation theory. [C] talks about a third mathematical formulation which has not been mentioned in the paragraph and can be negated. [D] talks about the evolution of quantum mechanics while the preceding sentences are about the different mathematical formulations. Thus [D] can be the first sentence of the passage which introduces quantum mechanics but it cannot follow the last sentence. Thus it can be negated. [E] is contradictory to the given information in the paragraph and can be negated. Hence, [B].

6. In order to weaken the given argument, we need to show that Ranu was good at sports. [A] further strengthens the given argument and can be negated. [B] weaken the argument since if Ranu is a national shot-put champion, she cannot be an ordinary sportsperson. [C] gives a reason for the bad performance of Ranu but does not weaken it. Though [D] and [E] indicate Ranu's performance in the college sprint events, it does not throw light on how she is as a sportsperson and can be negated. Hence, [B].

7. 'Eminent' means 'distinguished or noteworthy', 'imminent' means 'likely to occur at any moment' or 'impending', 'immanent' means 'inherent' or 'inborn' and 'eminence' means 'of high rank or repute'. A speaker can be 'eminent' i.e., 'distinguished' but other options do not fit the first blank. Thus [B] and [E] can be negated. Justice can be 'immanent' i.e, 'inherent' while other words do not fit in context to justice. Thus [A] can also be negated as justice cannot be 'impending'. People will not come to the lecture if the rain is likely to occur or 'imminent'.

Thus only 'imminent' fits the third blank correctly. People in the audience can reach high rank or achieve 'eminence' in various fields. Thus only [C] correctly fits all the blanks. Hence, [C].

8. 'Cacophonic' means 'harsh discordance of sound' and 'cacographic' means 'bad handwriting' or 'incorrect spelling'. 'Calamitous' means 'disastrous' and 'catastrophic' means 'a disastrous event'. 'Contraindicative' means 'to give indication against the advisability of (a particular remedy or treatment). 'Cataclysmic' means 'disastrous'. Thus from the given meanings, only 'calamitous, catastrophic and 'cataclysmic' mean 'disastrous' and have similar meanings. Hence, [D].

9. 'Inferred' means 'derived by reasoning', 'feigned' means 'pretended'. 'Separation' means 'division' or 'keeping apart', 'deportment' means 'the manner in which a person behaves, especially in physical bearing'. 'Prescribed' means 'laid down in writing as a rule', 'forged' means 'imitated' or 'beat into shape'. 'Parting' means 'division or separation' and 'proscribed' means 'prohibited or banished'. 'Implied' means 'indicated indirectly' and 'faked' means 'tricked or deceived'. 'Demeanour' means 'conduct or behaviour' and 'cessation' means 'ending or termination '. According to the given sentence, the accused had stopped all criminal activities by conducting like a sanyasi yet the court had asked for a lie detector test. Thus 'inferred' or 'implied' both can fit the first blank correctly. Thus 'feigned' and 'faked' both can fit the second blank but not 'forged'. Thus [B] can be negated. Though 'separation', 'parting' and 'cessation' fit the third blank, 'cessation' cannot be followed by the preposition 'from' but by 'of'. Thus [E] can also be negated. Since 'deportment' is usually for 'physical bearing', 'demeanour' is a better fit in the fourth blank. Thus [A] can also be negated. The court can 'prescribe' a lie detector test but not 'proscribe' it. Thus [C] can also be negated. Hence, [D].

10. Statement 1 is a general statement which states that the present results are the causes of the past. Statement 2 talks about the specific result of Murali who secured 1st rank though he did not work hard. [A] is incorrect since Statement 1 is a valid statement. [B] is correct since both the statements contradict each other, one as a general statement and 2 as a specific example. [C] is incorrect since both the statements do not supplement each other. [D] is incorrect as nothing is mentioned about Statement 2 being a rare event. Since Statement 2 has been given as an example to show how Statement 1 can be negated, [E] is also incorrect. Hence, [B].

11. The passage talks about how 'dreams' can be interpreted with the help of psychological techniques. Thus 'dreams' are 'overt effects' ('overt' means 'open to view or knowledge'). According to the second sentence, dreams are caused by psychic forces which are 'covert' (which means 'disguised or covered'. [A] and [B] are incorrect since they mention dreams as 'overt causes' while according to the paragraph, dreams are the effects of psychic forces. [C] is incorrect as 'dreams' are not 'covert' but 'overt'. [D] is incorrect as nothing is mentioned about judging persons or dreams. Only [E] correctly captures the ideas in the first two sentence. Hence, [E].

12. [A] is incorrect as nothing has been mentioned about surrender since the protagonist was already in jail. [B] was one of the ideas that the protagonist was planning before the desire to live arose within him. Thus it can also be negated. [C] is incorrect as nothing has been mentioned about fighting the jailer, though the protagonist wanted to strangle the person who came to carry the corpse. [D] was another plan of action that the protagonist thought of before strengthening his will to live. Thus [D] can also be negated. [E] was the solution to his problem as the protagonist exchanged paces with his dead friend since nobody checks a corpse as mentioned in the third sentence of the last paragraph. Hence, [E].

13. 'Sarcasm' means 'harsh irony'. Since the protagonist has already lived for so long and suffered so much, if he dies now, it would mean that destiny has won over and defeated him. Only [A] correctly conveys the meaning of the given phrase. 'Destiny' has not asserted itself (which means 'insisted its rights) as long as the protagonist is willing to fight for his life. Thus [B] can be negated. [C] is incorrect as if the author gives up, his struggles would go in vain. A mockery of destiny is only possible if he escapes from the dungeon which has not yet happened. Thus [D] can also be negated. Since destiny is not his enemy, [E] is also incorrect. Hence, [A].

14. [A] does not capture the mood and is thus incorrect. Though the protagonist is despairing he is not daring anything. He does have the idea of attacking the jailers but he is not hopeful after attacking them and only looks at it as a means to end his life. Thus [B] is also incorrect. [C] correctly captures the mood of the protagonist as he goes from depression to daring by exchanging places with the dead body. This is also reflected in the last line of the second paragraph (from despair to an ardent desire). Nothing has been mentioned about going from the darkness of the dungeon to the light outside and thus [D] can also be negated. 'Loathing' means 'strong dislike' while 'yearning' means 'deep longing'. The mood of the protagonist is that of depression but not loathing though he yearns to live. Thus [E] can also be eliminated. Hence, [C].

15. 'Counterpane' means a 'bedspread' and is thus related to 'bed'. 'Dungeon' means 'a prison or cell'. 'Guillotine' means 'a device used for beheading a person' and is thus related to 'execution'. 'Shroud' means 'a cloth in which a corpse is wrapped for burial' and is thus related to 'burial'. Thus the correct match is i-b, ii-d, iii-c and iv-a. Hence, [A].

16. The first sentence of the last paragraph clearly indicates that in early stages of learning, the neural circuits are activated piecemeal i.e., in fragments or gradually. Thus only [A] can be correctly inferred for the learning of a nursery student. [B] and [E] are incorrect as the neural circuits are weak an incomplete during the early stages of learning. Thus it cannot be a pleasant or happy experience. [C] is incorrect as the behaviour does not become complex but rather the neural circuits become more complex while learning. Nothing is mentioned about which subjects create simpler neural networks or circuits. Thus [D] is beyond the scope of the passage. Hence, [A].

17. The fourth sentence of the passage clearly negates I as it mentions that the brain works together as a whole and not as separate hemispheres. II is correct according to the first sentence of the third paragraph which mentions that connections are formed not only with adjacent neurons, but with neurons in other part of the brain. III can also be inferred from the same sentence. Though the paragraph mentions learning relate to the 'sound of words', nothing has been mentioned about receiving inputs from multiple sources. Thus IV can be negated. The last sentence of the paragraph negates V. Hence, [B].

18. According to the passage, new things can be learnt slowly and steadily to increase your knowledge and learning. [A] is incorrect since new learning is usually done at a very small age and thus the learner is not wise enough to know that he/she is ready. [B] means that man is the product of his habits and behaviour developed in the childhood. Though it seems right, the passage is only limited to learning new things and not to habits or behaviour in general. Thus it can be negated as it encompasses a broader outlook than the one in the passage. [C] means that problems that occur along the way do not matter as long as the outcome is happy. This cannot be applied in case of new learning and can thus be negated. [D] means people who have long been used to doing things in a particular way will not abandon their habits and has no relation to the passage as it is about learning new things. Thus it can also be negated. [E] means many small amounts accumulate to make a large amount which is consistent with the theme of the passage. Hence, [E].

19. According to the third sentence of the second paragraph, less time is required to activate established connections. Also according to the third sentence of the last paragraph, more is the experience or exposure, less is the time required to activate the neural network. Thus [A] and [C] are incorrect as the father would have more exposure and would require less time to activate neural networks. Thus [B] is correct. [C] is also incorrect as the father has more experience with age since both have been learning since they were 15. Thus the son would have only 10 years of exposure while the father would have 45 years more experience than the son. [E] is also incorrect according to the paragraph. Hence, [B].

20. The fourth sentence of the paragraph clearly states that 'orchids' are less-numerous. It means that in comparison with dandelions, orchids have lower numbers. However, this does not mean that they are insufficient or scarce in number. Thus, though [A] is close, it is incorrect. The penultimate paragraph only states what can happen to 'orchid' children if they are given greenhouse care or are ignored. Thus [B] and [E] are incorrect. [C] is also incorrect as the fourth sentence clearly states that orchids can excel in environments which suit them and hence are not weaker than 'dandelions'. In [D], 'anaesthetised' conditions mean 'with love and care' which is correct according to the third sentence of the penultimate paragraph. Thus [D] is correct according to the passage. Hence, [D].

21. According to the first sentence of the paragraph, persons carrying 'risk allele' are more likely to suffer from certain mood, psychiatric or personality disorders. However [A] is incorrect since it mentions that all people with 'risk allele' are self-destructive and antisocial. In the last paragraph, the author states that the different temperaments of both 'dandelions and orchids' are needed for the evolutionary success of humankind. Thus [B] is incorrect. [C] is incorrect as the passage clearly states that though 'dandelions' can survive in any environment, 'orchids' are likely to wilt in abusive conditions. The second paragraph clearly states that though a person is susceptible to sociopathic behaviour, it can happen only if the person suffers a traumatic or stressful childhood. Thus [D] correctly states that all children with genetic vulnerability need not necessarily be sociopaths. [E] is incorrect as the last sentence of the penultimate paragraph clearly states that it is an evolutionary bet which can have high risks or high rewards. Hence, [D].

22. 'Diathesis' means 'a constitutional tendency to a particular disease'. Hence, [A].

23. According to the information given, Mr. Evil was a self-made man. Thus he can be said to be an 'orchid'. Nothing can be inferred about Mr. Good since he was brought up in a protective environment. He would have thrived in any environment if he was a 'dandelion' and if he was an 'orchid', he would still thrive since his environment was protective. Thus [A] can be negated as Mr. Evil cannot be a dandelion as he was arrested for fraud. [B] is correct according to the information given in the passage. [C] is incorrect as Mr. Evil can be inferred to be an 'orchid'. [D] is incorrect as Mr. Good cannot be necessarily confirmed to be an 'orchid'. [E] is also incorrect. Hence, [B].

24. Since the paragraph clearly states that markets cannot be efficient for public goods, only 'air' is a 'public good'. All the others are private goods from which an individual can be excluded for various reasons. Hence, [C].

25. [A] can be concluded from the third sentence which clearly states that markets fail for pure public goods and so public intervention is needed. According to the second sentence, market competition solves adverse selection and moral hazard problems. Thus [B] can also be concluded from the paragraph. [C] cannot be concluded since the voting mechanisms are mentioned to be non-monetary mechanisms and not strategic voting. [D] can be inferred from the fourth sentence of the paragraph which states that the incentive problem of acquiring private information must be solved. [E] can be inferred from the last sentence of the paragraph. Hence, [C].

26. According to the paragraph, market failure is for public goods. Thus statement 1 is an example of market failure for public goods but statement 2 does not corroborate (which means 'confirms') it but negates it. Hence, [A] can be negated. Though 'adverse selection' is correct for statement 1, statement 2 reduces the moral hazard problem and is not an example of it. Thus [B] can also be negated. [C] is correct as granting tax benefits will incentivise companies to adopt eco-friendly practices. [D] is incorrect as giving 'tax benefits' is not a private good. [E] is not in the scope of the passage. Hence, [C].

27. The second paragraph is not an example which supports brainstorming. Rather it is an explanation of why the technique is useful. Thus [A], [B] and [C] can be negated. [D] is only partially correct as the second paragraph also gives an explanation to why the technique is useful. So [D] can also be negated. [E] states the relationship between the two paragraphs perfectly. Hence, [E].

28. According to the author, brainstorming is necessary for enriching idea generation. Viewing students in various roles would not help in creating new ideas. Thus [A] can be negated. Playing multiple roles in organizations is not the same as brainstorming. Thus [B] can also be negated. The author has used brainstorming in relation to management teams which are not the same as a sports team. Thus [C] can also be negated. [D] is correct according to the last sentence of the paragraph. [E] is incorrect as nothing has been mentioned about the number of people involved in effective brainstorming. Hence, [D].

SECTION II: Decision Making and Analytical Reasoning

29. [A] is incorrect as not taking an action against Mr. Loyal would adversely affect the image of NPP but it would not have any effect on Mr. Loyal. [B] is incorrect as suspending Mr. Loyal's son would adversely affect only Mr. Loyal but would improve the image of the party. [C] would adversely affect both Mr. Loyal (since he will be expelled from the party) and NPP (since it can lead to a split in the party). Only banning Mr. Loyal from entering party premises does not have any effect on Mr. Loyal. However, if found guilty, it can tarnish the party's image. [E] is incorrect as an internal inquiry would better the image of the party. Hence, [C].

30. [A] is incorrect as it would adversely affect the party's image for supporting Mr. Prodigal. [B] is incorrect as if Mr. Prodigal is expelled, Mr Loyal might lead to a split in the party. For the same reason, [E] is also incorrect. [C] is correct as the party can still keep Mr. Loyal and his son as members and yet better their image. Though [D] is also close, [C] is the better option as if found guilty, the party will still have the threat of Mr. Loyal splitting the party. Hence, [C].

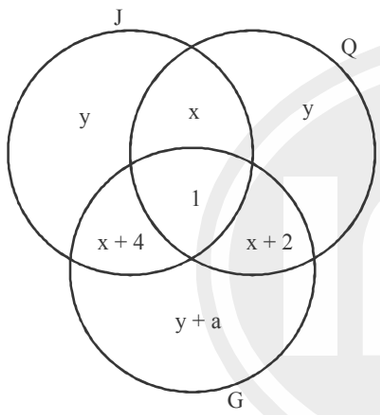
31. I is a valid point at the paragraph clearly mentions that supporting Mr. Loyal is adversely affecting NPP's image. Disowning Mr. Loyal does not give a reason for increasing the chances of Mr. Opportunist's candidature. Hence, II is not correct. III is incorrect, as it talks about Mr. Loyal getting re-elected. But it does not give a reason

to favour Mr. Opportunist's candidature in the party. Thus [A], [C] and [D] can be eliminated. IV is correct since Mr. Opportunist can rightly claim that since he has many followers in the constituency, he has a good chance of winning the election. V does not have any relation to the given argument. Thus [E] can also be eliminated. Hence, [B].

32. Since the chance of winning is high, Mr. Loyal should join the opposition party to resurrect his political career. [B] is incorrect since not participating in the campaign is not going to make any difference to his political career. [C] is incorrect as even if it proves Mr. Loyal's loyalty, it will not help his political career in any way since he has been suspended from the party. Though [D] is also an option that Mr. Loyal can consider, he should not follow it as his chances of winning are low. [E] will also not help Mr. Loyal's political career though he can still wield political influence indirectly. Hence, [A].

Answers to questions 33 to 35:

Let 'y' be the number of only J electives or only Q electives.
Let 'y + a' be the number of only G electives.
Let 'x' be the number of JQ electives, then 'x + 2' will be the number of QG electives and 'x + 4' will be the number of JG electives.
The information given in the question can be represented as given below:



$\therefore$ y + y + y + a + x + x + 2 + x + 4 + 1 = 20
$\Rightarrow$ 3x + 3y + a = 13 .... (I) [such that x, y a $\geq$ 1 and are all integers]

33. Number of G type electives
$\Rightarrow$ y + a + x + 4 + x + 2 + 1
$\Rightarrow$ 2x + y + a + 7 ..... (II) such that x, y, a $\geq$ 1 and are all integers
Now putting x = 1 (I) we get
3y + a = 10 ..... (III)
Further if we put y = 1, 2, 3 in (III)
we get a = 7, 4, 1 respectively
Putting x = 2 in (I) we get
6 + 3y + a = 13
$\Rightarrow$ 3y + a = 7 ..... (IV)
Putting y = 1 and y = 2 in (IV) we get a = 4 and a = 1 respectively
Putting x = 3 in (I) we get
3y + a = 4 ..... (V)
The above equation is only satisfied with y = 1 and a = 1.
Now, number of G type electives is to be calculated using 6 sets of possible values of x, y and a.
(1) x = 1, y = 1, a = 7

$2x + y + a + y \Rightarrow 2 + 1 + 7 + 7 = 17$

(2) $x = 1, y = 2, a = 4$

$2x + y + a + 7 \Rightarrow 2(1) + 2 + 4 + 7 = 15$

(3) $x = 1, y = 3, a = 1$

$2x + y + a + 7 \Rightarrow 2(1) + 3 + 1 + 7 = 13$

(4) $x = 2, y = 1, a = 4$

$2x + y + a + 7 \Rightarrow 2(2) + 1 + 4 + 7 = 16$

(5) $x = 2, y = 2, a = 1$

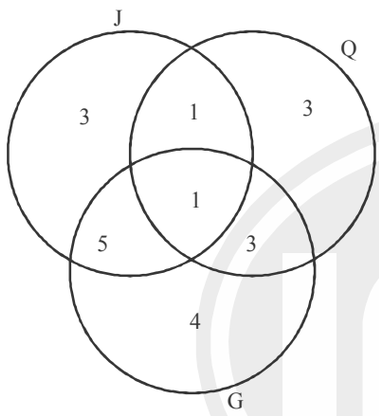
$2x + y + a + 7 \Rightarrow 2(2) + 2 + 1 + 7 = 14$

(6) $x = 3, y = 1, a = 1$

$2x + y + a + 7 \Rightarrow 2(3) + 1 + 1 + 7 = 15$

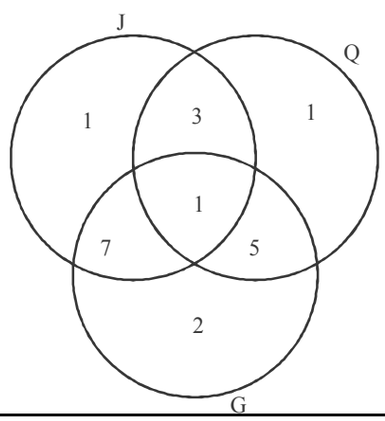
So the number of G type electives can be 13/14/15/16/17 i.e. a total of 5 values.
Hence, [B].

34. Using the data from the answer to the previous question, if the number of only J type electives (i.e. y) = 3, then x = 1 and a = 1. The Venn diagram is represented as below:



Since Raj prefers G type electives and Simran prefers J type electives, we need to choose maximum JG electives (i.e. 5)
Raj can choose 2 of the remaining 3 only J electives and Simran can choose 2 of the 4 only G electives to complete their minimum 7 electives.
Hence, [C].

35. Since the number of only G electives (i.e. y + a) is 2 and since a and y both have to be at least 1 $\Rightarrow$ y = a = 1. Referring to data from answer to question 33, x = 3
Venn Diagram can be represented as below:



Since Vijay is interested only in J type electives he can choose his 7 electives from 1 only J elective and 7 JG electives.
Further, as Raj is interested only in G type electives, he can choose 2 only G electives and 5 GQ electives.
So there is a possibility of them both not sharing any common elective.
Hence, [A].

36. [A] is incorrect as even if Mr. Patel is transferred to another department, the person who will come in his position will still follow up the matter with Dipangshu. [B] is incorrect since the email talks about his behavioural improvement and not about his work. So even if Dipangshu gets transferred to a new team in the same project, it would not have any effect on his behaviour which needs to change. [C] is also incorrect due to the same reason as a change in project would not necessarily entail a change in behaviour. [D] is incorrect as it might be the reason for his change in behaviour but it does not give a reason for focussing on the job. Only [E] makes sense as failure to perform in the client meet would make things worse for Dipangshu. Hence, [E].

37. The last time around, Mr. Patel had not allowed Dipangshu to speak. There is no indication to show that things have changed for the better than the last time. Hence, [A] is incorrect. Since Dipangshu could not think of a life without a job, rejecting the offer from the start-up is not a good idea as there is nothing else lined up for him. Thus [B] can also be rejected. [C] is also incorrect as Dipangshu has not yet accepted the start-up's offer and he would not have any job till he accepts the offer. [D] is correct as it will help Dipangshu to have both the job in the start-up or else use the next three months to search for other jobs. [E] limits Dipangshu's options and does not tell what to do if his request is rejected. Hence, [D].

38. I is a better option than II as the latter does not given any reasons for why Dipangshu is important to the organisation. Thus [B] can be negated. Only chatting with Dipangshu does not necessarily convey to him what Mr. Patel is thinking about him or how he wants Dipangshu to rethink his idea of quitting the job. Thus III is not the correct action. This eliminates [A] and [E]. Since I and II only talk about Mr. John without taking Dipangshu in the picture, it can also be eliminated. IV is correct as Mr. Patel can convey his thoughts to Dipangshu. V is also correct as it will help to sort out any differences between Mr. John and Dipangshu. Thus the correct steps are I, IV and V. Hence, [D].

39. Since there is heavy initial investment without any chances of success, [A] will help to reduce Mr. Arbit's enthusiasm as in this case only the cost is known but not the benefits. [B] and [C] will increase his enthusiasm as they look at the prospect when the new technology is successful. [D] will also not decrease his enthusiasm as if technology risks can be controlled, there is a chance of the technology being successful which is not mentioned in the paragraph. [E] is a general statement and would not have any bearing of the success or failure of new technology. Hence, [A].

40. Giving them information about competitors using risky technologies would not decrease the uncertainty faced by both the partners since they do not have any information about the kind of technologies that their competitors are using. Thus [A] is incorrect. [B] is also incorrect as it does not guarantee the success of the technology. [C] is not correct as it talks about the probability of the technology's success. [D] is correct since if the R&D team is working to counter any downside of the technology, they will be assured of getting solutions to any problems that might crop up while using the new technology. [E] is a general statement and does not concern the problem of investment in a technology whose outcome is unknown. Hence, [D].

41. Difference between expected foregone earnings of Mr. Arbit and Mr. Boring will be the same as the difference between the expected earnings from the business with the new technology as earnings from business without new technology is deducted from expected earnings as calculated by both individuals.
Expected earnings as per Mr. Arbit = $150000\ (1.1^4 + 1.1^3 + 1.1^2 + 1.1 + 1)$ ..... (I)
Expected earnings as per Mr. Boring = $150000\ (1.1^4 + 1.1^3) + 50000\ (1.1^2 + 1.1 + 1)$ .... (II)
Subtracting II from (I) we get
$100000\ (1.1^2 + 1.^1 + 1)$
$\Rightarrow$ 1,21,000 + 1,10,000 + 1,00,000
$\Rightarrow$ 3,31,000 million rupees. Hence, [B].

42. Let us assume that 51% of the total sales volume of LSP is from outside India, so 49% of the sales volume will be from India.
Let us further assume 51% of sales is from generic drugs.
So 49% of the sales will be from patent drugs
option

[A] Clearly, if sales volume of patented drugs in India is 43%, sales volume of generic drugs in India will be 100 – 43 = 57%
So this statement is not true.

[B] Sales volume of Generic Drugs in Foreign Countries = $\frac{24}{100} \times 51 = 12.24\%$
Sales volume of Patent Drugs in Foregin Companies = 51 – 12.24 = 38.76
Sales Volume of Patent drugs in India = 49 – 38.76 = 10.24
Percentage Sales Volume = $\frac{10.24}{49} \times 100 \cong 20.8\%$
So this statement also may not be true.

[C] Sales Volume of Patent Drugs in India = $\frac{54}{100} \times 49 = 26.46$
Sales volume of Generic Drugs in India $\Rightarrow$ 51 – 26.46 = 24.54
Sales Volume of Generic Drugs outside India = 51 – 24.54 = 26.46
Percentage Sales Volume of Generic Drugs outside India = $\frac{26.46}{51} \times 100 \cong 51.8\%$
So this statement also may not be true.

[D] Sales Volume of Generic Drugs in India = $\frac{100-29}{100} \times 49 = \frac{71}{100} \times 49 = 34.79$
Sales Volume of Generic Drugs in Foreign countries = $\frac{51-34.79}{51} \times 100 \cong 31.7\%$
So this statement is true.

[E] Sales volume of patent drugs in India = $\frac{100-60}{100} \times 49 = 19.6$
Sales volume of patent drugs in foreign countries = 51 – 19.6 = 31.4
Percentage of patent drugs in foreign countries = $\frac{31.4}{51} \times 100 \cong 61.5\%$
So this statement may also be true.

Let us assume another scenario represented by the grid below:

	Generic	Patent	Total
Outside India	97	1	98
India	1	1	2
Total	98	2	100

As per this scenario, sales volume percentage of Patent Drugs in foreign countries = $\frac{1}{97} \times 100 \cong 1.3\%$ which is less.
So statement [E] may or may not be true.
Only statement [D] is definitely correct.
Hence, [D].

43. Developing new drugs is not going to improve the business. Thus I is an incorrect option. This eliminates all the options except [D]. Increasing sales of cough syrup, trying to cut costs and recruiting more medical representatives in the rural areas will all help to increase the sales in rural areas. Hence, [D].

44. [A] is incorrect as it would mean that the couple would have to stay apart which they would be unwilling to accept as mentioned in the third sentence of the paragraph. [B] is a better option as it would allow Mr. Jose to be transferred to the Luxembourg office and also allow Mrs. Jose to work and be with him simultaneously. [C] and [E] are incorrect as the given information clearly mentions that the Luxembourg office is important and the company wants someone for the office as early as possible. Both [C] and [E] are correct from the point of view of the couple being together but leaves the position of Luxembourg office vacant at least in the near future. [D] is incorrect as it would mean that Mrs. Jose would have to leave her job. This will be a double loss for the company as it will lose an employee (Mrs. Jose) and hire a new one to replace her. Hence, [B].

45. I is incorrect as it does not have any guarantee that Mrs Khan will get the same job if required. Thus though her family life will be settled, her professional life will suffer. II is incorrect as it is talking about only spending two months in New York with Mr. Khan and then coming back to join her job. Thus her professional life will not suffer, but her family life will suffer as both the spouses will be in different countries. III is correct as it will help Mrs. Khan to balance both work and family. IV is incorrect as it does not guarantee a job for Mrs. Khan though her family will be complete. V is also a good option as it will help Mrs. Khan to strike a balance between work and family. Hence, [E].

46. I is correct since low awareness about organic vegetables means that Ram can skip their use without the customers knowing about the difference. II is incorrect as the business was doing well and hence so cannot be used as an argument against Ram. III is also correct as if using organic vegetable is not a differentiating factor, then there is no point in using them. IV is also correct as the price difference in Delhi and Panipat was also a deciding factor to stop using organic vegetables. V is also correct as Ram would have to procure the organic vegetable from far which would further increase the cost of these vegetables which in turn will be passed on to the customers. Thus the correct options supporting Ram's argument are I, III, IV and V. Hence, [C].

47. [A] is a good option as it will help Kishan be trained in the Connaught Place branch which he can replicate in Panipat. [B] is incorrect as according to Businessman 4, the tastes of the Panipat customers might change one day. [C] is incorrect as bringing Ram to Delhi will not solve the problem of running the Panipat branch effectively. [D] is incorrect as only changing the name of the business will not help Mohan's business. [E] is also incorrect as if Kishan is asked to run the Panipat branch without any training, he too may run the Panipat branch of Mohan's differently. Hence, [A].

48. Creating awareness about organic vegetables will be a general step and not necessarily help Mohan's become more profitable. Thus [A] can be negated. Since Mohan is worried about how the Panipat branch is run, he should look after its working himself. [C] is incorrect as the paragraph clearly mentions that the Panipat branch had grown fast. [D] is only partly correct as sending Kishan to Panipat did not automatically guarantee that the Panipat branch will be run the same way as that of Connaught Place though bringing Ram back might change the workings of the Panipat branch. [E] is also incorrect as hiring a new person does not guarantee that the Connaught Place model will be replicated in Panipat. Hence, [B].

49. Having a combined score of the two parts would not solve the problem of getting more entrepreneurial mind-set students since students who have done exceedingly well in Part A will be selected even if they have not scored very well in Part B . II is the correct option to choose more students with entrepreneurial mind-set since both Part A and B will have separate cut-offs. III is also correct as getting more marks while solving application-based problems will incentivise students to solve more of them. IV is incorrect as it would not be ethical for the institute to withhold information about marking system without mentioning in the question paper. Hence, [D].

50. I and II will help Balaji to prepare a strategy for solving application-based problems. III is incorrect as it will not help Balaji in preparing for the exam. IV and V are also correct options as they will help Balaji in preparing for the formula-based questions. VI is also wrong as it mentions information after completing the MBA and not while preparing for the exam. Hence, [E].

SECTION III: QUANTITATIVE ABILITY & DATA INTERPRETATION

51. The first step is conducting an initial energy audit to explore where IIB can reduce carbon footprints. Once they carry that audit, then they can start implementing the recommendations of the audit. Both I and III are concrete steps that can be taken by IIB to reduce carbon footprints. However, organizing a seminar is easier than replacing street lights with solar panels as it requires getting the required permission from the respective authorities. II cannot be carried out easily and will also require more funds to replace buildings. Thus it is not a preferred step. Also introducing a course on sustainability does not in any way change the carbon footprint of IIB. Thus the correct steps are V, III and I. Hence, [E].

52. The given series is an A.P. with a difference of –2.

There are $\frac{-64-(-100)}{2} + 1$

$= \frac{36}{2} + 1 = 19$ terms in the entre series

Sum of the given A.P. $= \frac{19}{2}[-64 + -100]$

$= \frac{19}{2} \times (-164) = -1558$

Hence, [B].

53. Volume of the solid metal cylinder $= \pi r^2 h$

$= \frac{22}{7} \times 7 \times 7 \times 10 = 1540 \text{ cm}^3$

Surface area of flat surface of cylinder $= 2\pi r^2 = 98\pi$

Now this cylinder is recast into 2 cones in the ratio 3 : 4. So volume of 2 cones is 660 cm^3 and 880 cm^3.

Let the radii of the 2 cones be 'R_1' and 'R_2' respectively.

$\therefore$ the height of both cones is 10 cm.

$\pi R_1^2 = 66$ and $\pi R_2^2 = 88$

$\Rightarrow R_1^2 = 21$ and $R_2^2 = 28$

$\therefore \pi R_1^2 = 21\pi$ and $\pi R_2^2 = 28\pi$

Combined surface area of flat surface of both cones $\Rightarrow 21\pi + 28\pi = 49\pi$

Change in flat surface area $= \frac{98\pi - 49\pi}{98\pi} = 50\%$

Hence, [D].

54. Let us say the manufacturing cost of the product is Rs.100. The M.R.P. of the product will be Rs.155

Since the retailer gives a 10% discount on the M.R.P. he sells it at $\frac{90}{100} \times 155 =$ Rs.139.5

Let the C.P. of the retailer be 'x'

Now percentage profit $= \frac{(139.5 - x) \times 100}{x}$

$\Rightarrow \frac{139.5 - x}{x} \times 100 = 23$

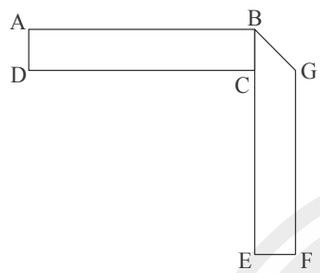
$\Rightarrow 13950 - 100x = 23x$

$123x = 13950 \Rightarrow x \simeq 111.3$

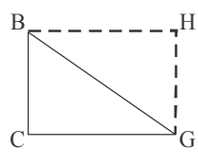
Profit percentage of manufacturer = 111.3 – 100 = 11.3. which is closest to option [E].
Hence, [E].

55. Probability of receiving the gift in time
$\Rightarrow$ 1 – Probability of not receiving the gift in time
$\Rightarrow$ 1 – [P(A not delivering the gift) × P(B not delivering the gift) × P(C not delivering the gift) × P(D not delivering the gift)]
$\Rightarrow$ 1 – [(1 – 0.6)(1 – 0.8)(1 – 0.9)(1 – 0.5)]
$\Rightarrow$ 1 – 0.4 × 0.2 × 0.1 × 0.5
$\Rightarrow$ 1 – 0.004 = 0.996
Hence, [E].

56. Let us represent the question figure as:



Suppose the original rectangle was AEFD
Now the rectangle is folded along BG.
$\therefore$ the overlapping part BCG would have been a square, had the rectangle not been folded.
BCG would appear as below (if unfolded) (i.e. it would be square BCGH)



So BCG is an isoceles right angled triangle, where BC = CG = 6 m

Area of BCG = $\frac{1}{2} \times 6 \times 6 = 18$ sq.m

Now the additional area on unfolding would be the second equal part of square BCGH i.e. triangle BGH.
So on unfolding, 18 sq.m gets added to the area of the entire figure.
Area of original unfolded rectangle = 144 + 18 = 162 sq.m.
Hence, [C].

57. At x = 0, y $\cong$ –3.9 and y $\cong$ 2.4
Since the given graph is in the shape of a parabola, the curve will be of the form
$x = ay^2 + by + c$
This leaves us only option (C) and (E)

Using option (C), at x = 0 we get $2y^2 = 40 \Rightarrow y^2 = 20$ or $y = \pm 2\sqrt{5}$
So option (C) is incorrect
Using option (E)

$2y^2 + 3y - 19 = 0$

The roots of the equation (say α and β) are $\frac{-3 \pm \sqrt{9+152}}{4}$

$\Rightarrow \frac{-3 \pm \sqrt{161}}{4}$

$\sqrt{161} \simeq 12.6$

$\Rightarrow \alpha = \frac{-3+12.6}{4}, \beta = \frac{-3-12.6}{4}$

$\Rightarrow \alpha = \frac{9.6}{4}, \beta = \frac{-15.6}{4}$

So, $\alpha = 2.4$ and $\beta = -3.9$, which is satisfies the given equation.
Hence, [E].

58. Let the quantity of chemical X be '5a' units
and the quantity of chemical Y be '4a' units.

So quantity of material B in chemical X is $\frac{15a}{4}$ units

and quantity of material B in chemical Y is '$\frac{8a}{3}$' units

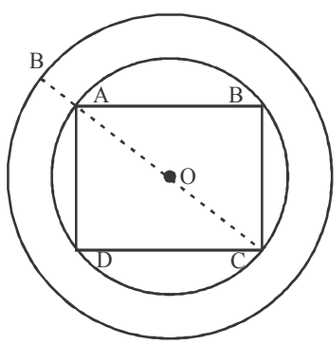
Total quantity of material B in product M = $\frac{15a}{4} + \frac{8a}{3} = \frac{77a}{12}$ units

Total quantity of M $\Rightarrow$ 9a = 864 $\Rightarrow$ a = 96 units

Total quantity of material B in product M $\Rightarrow \frac{77}{12} \times 96 = 616$ units

This is half of the final mixture.
$\therefore$ Final mixture will contain $616 \times 2 = 1232$ units
Quantity water in the final mixture = 1232 – 864 = 368 units
Hence, [B].

59. The figure as described in the question can be depicted as below:



Let ABCD be the square field circumscribed by a circular road
$\therefore$ Perimeter of the field = 200 sq.ft

Length of the field will be 50 ft and diagonal AC = $50\sqrt{2}$ sq.ft

'O' is the centre of both the circles and midpoint of AC

$\therefore$ AO = $\frac{1}{2}$ AC = $\frac{1}{2} \times 50\sqrt{2} = 25\sqrt{2}$ sq.ft

Area occupied by the circular road

$\Rightarrow \pi\left[\left(32\sqrt{2}\right)^2 - \left(25\sqrt{2}\right)^2\right]$

$\Rightarrow \pi\,(2048 - 1250)$

$\Rightarrow \frac{22}{7} \times 798$

$\Rightarrow 2508$ sq.m

Since half the road is constructed, cost of constructing the road is $\frac{1}{2} \times 2508 \times 100$

$\Rightarrow$ Rs.1,25,400

Hence, [B].

60. In ΔAED, Area = $\frac{1}{2} \times$ ED $\times$ AD

Now AD = AB + BC + CD

In ΔABF (which is a 30°-60°-90° triangle)

$\Rightarrow$ AB = $10\sqrt{3}$ units

In ΔCDE (which is also a 30°-60°-90° triangle) ED = $10\sqrt{3}$ units

In ΔBCF

$\Rightarrow \angle$ECD = $\angle$BCF = 60° ($\because$ they are vertically opposite)

So ΔBCF is a 30°-60°-90° triangle (where $\angle$B = 90°, $\angle$C = 60° and $\angle$F 30°)

Also BC = $\frac{10}{\sqrt{3}}$ units

Length of AD = $10\sqrt{3} + \frac{10}{\sqrt{3}} + 10$

Area of ΔAED = $\frac{1}{2} \times 10\sqrt{3} \times \left(10\sqrt{3} + \frac{10}{\sqrt{3}} + 10\right)$

$\Rightarrow \frac{1}{2} \times (300 + 100 + 100\sqrt{3})$

$\Rightarrow \frac{1}{2} \times (400 + 100\sqrt{3})$

$\Rightarrow 200 + 50\sqrt{3}$

$\Rightarrow 50(\sqrt{3} + 4)$ sq.units

Hence, [D].

61. The point of intersection of the two diagonals in the mid point of both diagonals.
Half the length of the 1st diagonal

$= \sqrt{(17.5 - 5.5)^2 + (23.5 - 7.5)^2}$

$= \sqrt{12^2 + 16^2}$

$= \sqrt{400} = 20$

Length of the 1st diagonal = 40 units

Half the length of the second diagonal

$= \sqrt{(17.5 - 13.5)^2 + (23.5 - 16)^2}$

$= \sqrt{16 + 56.25}$

$= \sqrt{72.25}$

= 8.5 units

Length of the 2nd diagonal = 17 units

Hence, [D].

62. Let x = 0

$\therefore\ f(0^2 - 1) = 0^4 - 7(0)^2 + R_1$

$\Rightarrow f(-1) = R_1$ .... (I)

Let x = 1

$f(1^3 - 2) = (1^3)^2 - 9(1)^3 + R_2$

$= 1 - 9 + R_2$

$= R_2 - 8$

$\Rightarrow f(-1) = R_2 - 8$ .... (II)

Equating (I) and (II)

Now $R_1 = R_2 - 8$

$\Rightarrow R_2 - R_1 = 8$

Hence, [B].

63. $P\left(1 + \frac{R}{100}\right)^6 - P = 25000$ ..... (I)

$P\left(1 + \frac{R}{100}\right)^3 - P = 10000$ ..... (II)

$P\left(1 + \frac{R}{100}\right)^6 - P\left(1 + \frac{R}{100}\right)^3 = 15000$

$P\left(1 + \frac{R}{100}\right)^3 \left[\left(1 + \frac{R}{100}\right)^3 - 1\right] = 15000$

$\Rightarrow P\left[1 + \frac{R}{100}\right]^3 \left[\frac{10000 + P}{P} - 1\right] = 15000$

$\Rightarrow \left[1 + \frac{R}{100}\right]^3 [100000 + P - P] = 150000$

$\Rightarrow \left[1 + \frac{R}{100}\right]^3 = 1.5$

$P\left[1 + \frac{R}{100}\right]^6 - P = 25000$

$\Rightarrow P\left[1+\frac{R}{100}\right]^3\left[1+\frac{R}{100}\right]^3 - P = 25000$

$\Rightarrow P(1.5)(1.5) - P = 25000$

$\Rightarrow 2.25P - P = 25000$

$\Rightarrow 1.25P = 25000 \Rightarrow P = \text{Rs.}20000$

Hence, [C].

64. To get the lower limit of the tax range, we have to take maximum possible people at the lower limit of each income slab.
5 people will be in the income slab of 0 to 500, 4 people just marginally above 500, 3 people marginally above 2000 and 3 people marginally above 5000
Tax liability of 5 people in 0-500 income slab will be 0. Tax liability of 4 people with income marginally above 500 will again be slightly greater than zero. For example, if the income of these 4 people is 501, their tax liability of will work out to $4 \times 0.05 \times (501 - 500) = 0.05 \times 4 = 0.2$, which is just above zero.
Similarly, tax liability of 3 people marginally higher than 2000 will be slightly more than $3 \times (2000 - 500) \times 0.05 = 225$
Tax liability of 3 people marginally higher than 5000 will be slightly more than $225 + 3 \times (5000 - 2000) \times 0.1 = 900 + 225 = 1125$
Lowest possible tax liability of these 15 people will be slightly higher than 225 + 1125 = Rs.1350
To get the upper limit of the tax, liability we have take maximum possible people at the upper limit of each income slab.
Let us assume that 5 people are earning just slightly less than Rs.10000, 4 people are earning exactly Rs.5000, 3 people are earning exactly Rs.2000 and 3 people are earning exactly 500.
The tax liability for the 3 people earning Rs.500 is 0.
Tax liability for the 3 people earning exactly Rs.2000 is $3 \times (2000 - 500) \times 0.05 \Rightarrow$ Rs.225
Tax liability for the 4 people earning exactly Rs.5000 is $4 \times (5000 - 2000) \times 0.1 + 4 \times 75 \Rightarrow$ Rs.1500
Tax liability for the 5 people earning slightly less than Rs.1000
$\Rightarrow 5 \times 75 + 5 \times 300 + 5 \times (10000 - 500) \times 0.15$
$\Rightarrow 375 + 1500 + 3750 = 5625$
Upper limit of tax liability of the 15 people will be slightly less than $\Rightarrow 5625 + 1500 + 225 = \text{Rs.}7350$
Hence, [A].

65. For this question we need to maximize the numerator and minimize the denominator.
The denominator can be minimized such that $a + b + c - d = 0$
For example if we take $a = 1$, $b = 2$, $c = 22$ and $d = 25$
Numerator = 1+ 2 + 22 + 25 + 51
Denominator = 1 + 2 + 22 – 25 = 0

$\frac{51}{0} = \infty$.

Hence, [E].

66. Since the required number leaves a remainder of 2 when divided by 3, 4, and 5, the number will be of the form $60x + 2$
Further, the number is also divisible by 11, so it will be of the form $11y$
Now $11y = 60x + 2$

$y = \frac{60x + 2}{11}$

So, we need to find the minimum possible value of x, where y is an integer

$y = \frac{60 \times 4 + 2}{11} = \frac{242}{11} = 22$

So the required number is 11y $\Rightarrow$ 11 × 22 = 242

Since 3, 4, 5 and 11 are all co-prime, the next numbers in the series will be of the form 242 + 3 × 4 × 5 × 11 × n

$\Rightarrow$ 242 + 660n, where n = 1, 2, 3, 4, ...

So 6th number of series will be 242 + 660 × 5 = 3542.

Hence, [C].

67. The top ranked student will get all 20 questions correct. So his net score will be 30.

The 2nd ranked student will get 19 questions correct and one 1 mark question incorrect. So his net score will be $29 - \frac{1}{3} = 28\frac{2}{3}$

The 3rd ranked student will get 19 questions correct and will not attempt one 1 mark question. So his net score will be $29 - \frac{1}{2} = 28\frac{1}{2}$

The 4th ranked student will get 19 questions correct and one 2 mark question wrong. So his net score will be $28 - \frac{1}{3} = 27\frac{2}{3}$

The 5th ranked student will get 18 questions correct and two 1 mark questions incorrect. So his net score will be $28 - \frac{1}{4} \times 2 = 27\frac{1}{2}$.

Hence, [A].

68. f(1 + 1) = f(1 × 1)

f(2) = f(1) = 4

f(3) $\Rightarrow$ f(2 + 1) = f(2 × 1)

$\Rightarrow$ f(3) = f(2) = 4

Similarly f(4) $\Rightarrow$ f(3 + 1) = f(3 × 1) = 4

and so on.

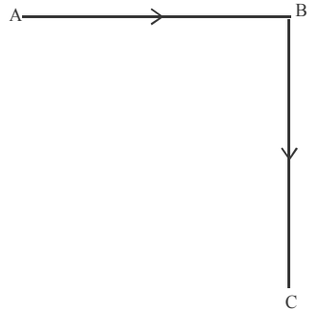
$\therefore$ f(x) = 4 for any positive integer 'x'

So f(1003) = 4

Hence, [E].

69. In scenario II, the minimum distance between Devanand and Pradeep always exceed 50 km as Pradeep is moving east so the horizontal distance between the two people is always more than 50 km.

In scenario III, the original distance between the two (which is 50 km) is continuously increasing. So the minimum distance can never be 40 km.



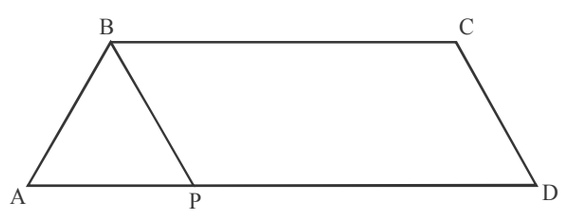
In scenario I, Devanand moves along path AB and Pradeep moves along path BC. The distance between the two of them after every hour will be as follows:

After	Distance
1 hour	$\sqrt{47^2 + 4^2} = \sqrt{2213}$
2 hours	$\sqrt{44^2 + 8^2} = \sqrt{2020}$
3 hours	$\sqrt{41^2 + 12^2} = \sqrt{1825}$
4 hours	$\sqrt{38^2 + 16^2} = \sqrt{1700}$
5 hours	$\sqrt{35^2 + 20^2} = \sqrt{1625}$
6 hours	$\sqrt{32^2 + 24^2} = 40$

So only in case of scenario I will be minimum distance between the two people be 40 km.
Hence, [A].

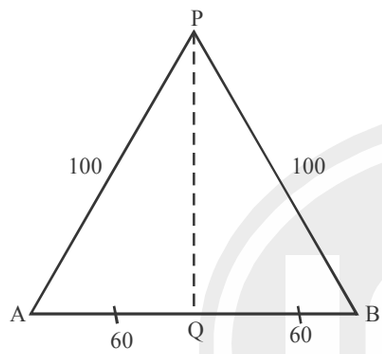
70. 8 known numbers given in the question data arranged in ascending order:
6, 8, 12, 13, 14, 15, 20, 22
Let the 3 unknown numbers be a, b, c
Now a, b, c > 15
Using statement I, difference between 4 largest and 4 smallest numbers will be 53
Sum of 4 smallest numbers = 6 + 8 + 12 + 13 = 39
Sum of 4 largest numbers = 39 + 53 = 92
Using statement I, difference between 4 largest and 4 smallest numbers will be 53
Sum of 4 smallest numbers = 6 + 8 + 12 + 13 = 39
Sum of 4 largest numbers = 39 + 53 = 92
To get the highest possible integer, we take the minimum possible values for 2 of the 3 unknown values.
Since 15 is the median, smallest possible values of the 2 unknowns will be 16 and 17
Let the highest possible integer be x
$17 + 20 + 22 + x = 92 \Rightarrow x = 33$
So, statement I alone is sufficient
Using statement II,
$6 + 8 + 12 + 13 + 14 + 15 + 20 + 22 + a + b + c = 176$
$\Rightarrow a + b + c = 66$
Now if we assume 2 of the 3 unknowns to have smallest possible value (i.e. 16 and 17) then, the value of the highest possible integer will be 66 – (17 + 16) = 33
So, statement II alone is sufficient.
Since either statement alone is sufficient.
Hence, [E].

71.



In the figure given let $\angle DAB = x°$, then $\angle BCD = 2x°$ and $\angle BPD = 2x°$

$\angle BPD = \angle BAP + \angle ABP$ ($\because$ Exterior angle is sum of interior angles)
$2x = x + \angle ABP$
$\therefore \angle ABP = x°$
$\because$ ABP is an isoceles triangle AP = BP ($\because$ $\angle ABP = \angle BAP$)
$\therefore$ In ABCD, BC : AD = 4 : 5
Let BC = 4y $\Rightarrow$ AD = 5y
Now PD = BC $\Rightarrow$ AP = y and PD = 4y
In PBCD $\Rightarrow$ 2(4y) + 2(y) = 100
$\Rightarrow$ 10y = 1000 $\Rightarrow$ y = 100
$\therefore$ AB + 500 + 400 + 100 = 1120 $\Rightarrow$ AB = 120 units
$\because$ BP = AP $\Rightarrow$ BP = 100 units
Now $\angle ABC = x + 180 - 2x = 180 - x$
$\sin\angle ABC = \sin(180 - x) = \sin x = \sin(\angle PAB)$
Let us draw ΔABP from the given figure where Q is the mid point of AB



Now since PAB is an isoceles triangle a perpendicular dropped from P to AB will bisect AB at point Q.

$\therefore$ In $\Delta AQP \Rightarrow PQ = \sqrt{100^2 - 60^2} = \sqrt{6400} = 80$

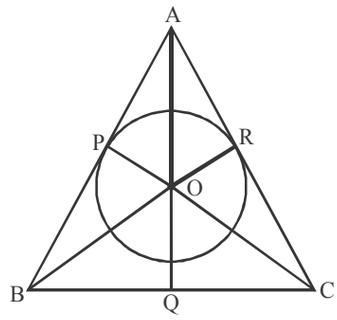
$\angle PAB = x°$

$\therefore \sin(\angle PAB) = \sin(\angle ABC) = \frac{80}{100} = \frac{4}{5}$

Hence, [A].

72. Since the original number as well as the new number are both divisible by 10, the units digit for both numbers will be 0 which implies that only the hundreds digit and ten's digit have been interchanged.
Let the original number be 100a + 10b
Then the new number will be 100b + 10a
Since the original number has digits in decreasing order, original number will be greater than new number
Difference between the original and new number
100a – 100b + 10b – 10a = 90a – 90b = 90(a – b)
Now since this number is divisible by 40
$\Rightarrow$ 9(a – b) has to be divisible by 4 where a > b
Possible values of a and b are (5, 1) (6, 2) (7, 3) (8, 4) (9, 5) and (9, 1)
Hence, [B].

73. Let depict the figure given in the question as below with O as the centre of the circle.



As per given data AO = BO = CO = 625 cm
Further OP = OR = 175 cm ($\because$ they are the radius of the circle)
Using Pythagoras Theorem

$AP^2 = \sqrt{AO^2 - OP^2}$

$\Rightarrow \sqrt{625^2 - 175^2} = \sqrt{360000}$

= 600 units
Now, PB = AR = CR = AP = 600 units
$\therefore$ AB = AC = 1200 units
In ΔAOP and ΔAOR
OA is common, OP = OR and AP = AR
So both these triangles are congruent
Let $\angle PAO = \angle OAR = x$
$\therefore \angle BAC = \angle PAR = 2x$

$$\text{Area } (\Delta ABC) = \frac{1}{2} \times AB \times AC \times \sin(\angle BAC)$$

$$= \frac{1}{2} \times AB \times AC \times \sin 2x$$

$$= \frac{1}{2} \times (1200)^2 \times 2\sin x.\cos x$$

$$= \frac{1}{2} \times 1200 \times 1200 \times 2 \times \frac{7}{25} \times \frac{24}{25}$$

= 387072

Hence, [B].

74. M! – N! = ... 999000
N![M × (M – 1) × (M – 2) ... (M – N) – 1] = ...999000
Let x = M × (M – 1) ... × (M – N)
$\therefore$ N!(x – 1) = ... 999000

$x - 1 = ... \frac{....999000}{N!}$

Case 1:
N = N + 1
N![N + 1 – 1 = N!N
N!N = (....999) × 2^3 × 5^3
The highest power of 2 that divides N!N is 2^3

$\therefore$ N has to be 5
5!(5) = 600
However this cannot be a solution.
Case 2: M > N + 1
x and N! are both even
($\because$ both are a product of consecutive numbers. So there will be at least one even number and hence product of consecutive numbers will also be even)
As x is even, x – 1 is odd
Now 'x – 1' can be odd only if N! has 3 zeros
So N can be from 15 to 19 as any factorial greater than 19 will have 4 zeros.
Now one of the values from 15 to 19 in the equation
M × (M – N) for the options should satisfy the given value

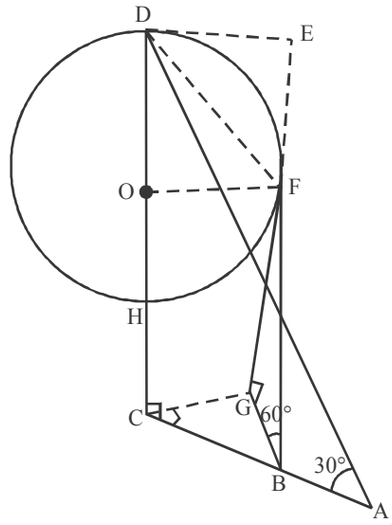
[A] $M \times (M - N) = 150 \Rightarrow M^2 - MN - 150$
By trial and error putting N = 19
$\Rightarrow M^2 - 19M - 150 = 0$
gives M = 25 or M = –6
So this is possible

[C] $M^2 - MN - 200 = 0$
Putting N = 17 $\Rightarrow M^2 - 17M - 200 = 0$. This gives M = 25 or M = –18

[D] $M^2 - MN - 225 = 0$
Putting N = 16
$M^2 - 16M - 225 = 0$
$\Rightarrow$ M = 25 and M = –9

[E] $M^2 - MN - 234 = 0$
$\Rightarrow M^2 - 17M - 234$
$\Rightarrow$ This gives M = 26 or M = –9
Now in option [B] for M – MN – 180 = 0
for N = 15 to 19, we do not get integral values of M
So M × (M – N) = 180 is not possible.
Please note that error is a error in the question as difference between 2 factorials can never end in 999000

75.



Let A be the initial position of the person.
AC is the horizontal distance of the person from the bottom of the tower.
Let D be the initial position of the minute hand at 5:00 pm and F be the position of the minute hand at 5:10 pm.
ΔACD is a 30°-60°-90° triangle
Given AC = 1800 m

$\therefore$ DC = $\frac{1800}{\sqrt{3}}$

= $600\sqrt{3}$ m

DO = length of minute hand = $200\sqrt{3}$ m

In ΔDOF, $\angle$DOF = 60° ($\because$ it covers 10 minutes or $\frac{10}{60}$ of the circumference of the clock)

Also $\because$ DO = OF (both are radii or length of the minute hand)

$\angle$ODF = $\angle$OFD = $\frac{180 - 60}{2}$ = 60°

$\therefore$ ΔDOF is an equilateral triangle

So DF = $200\sqrt{3}$ m
Now in ΔDEF $\because$ EF // DO, $\angle$DEF = 90°
Also DE $\perp$ OD ($\because$ Tangent perpendicularity Theorem)
So $\angle$FDE = 30° ($\because$ $\angle$ODF + $\angle$FDE = 90°)

EF = $100\sqrt{3}$ m and DE = 300 m

$\because$ EG = DC $\Rightarrow$ FG = $600\sqrt{3} - 100\sqrt{3} = 500\sqrt{3}$ sqm
Now FGB is a 30°-60°-90° triangle
$\therefore$ GB = 500 m
Also in ΔCGB, CG = DE = 300 m

CB = $\sqrt{500^2 - 300^2} = \sqrt{1600} = 400$ m

Distance travelled by person = AB = AC – BC = 1400 m

Speed of person = $\frac{1400}{600} \times \frac{18}{5} \Rightarrow \frac{42}{5} = 8.4$ km/hr

Hence, [D].

76. As the height of the water gets reduced to half its original height, the volume of water in the cone will get reduced to $\left(\frac{1}{2}\right)^3 = \frac{1}{8}$ of its original volume, which implies $\frac{7}{8}^{th}$ of the water in the cone is removed.

Now using the options

A] A is open for 19 hours which means B and C are open for 20 hours each.
Work done

$\Rightarrow 20\left(\frac{1}{12}\right) + 19\left(\frac{1}{8}\right) - 20\left(\frac{1}{4}\right)$

$\Rightarrow \frac{5}{3} + \frac{19}{8} - 5$

$\Rightarrow \frac{40 + 57 - 120}{24} = -\frac{23}{24}$ (which means $\frac{23}{24}$ of the cone is emptied)

B] Pipe A is open for 19 hours 30 minutes and pipe B and C are open for 20 hours each
Work done

$\Rightarrow 20\left(\frac{1}{12}\right) + \frac{39}{2}\left(\frac{1}{8}\right) - 20\left(\frac{1}{4}\right)$

$\Rightarrow \frac{5}{3} + \frac{39}{16} - 5$

$\Rightarrow \frac{80 + 117 - 240}{48} = \frac{-43}{48}$ (which means $\frac{43}{48}$ of the cone is emptied)

C] Pipe B is open for 19 hours 30 minutes and pipe A and C are open for 20 hours
Work done

$20\left(\frac{1}{8}\right) + 39\left(\frac{1}{12}\right) - 20\left(\frac{1}{4}\right)$

$\Rightarrow \frac{5}{2} + \frac{13}{8} - 5$

$\Rightarrow \frac{20 + 13 - 40}{8} = \frac{-7}{8}$ (which means $\frac{7}{8}$ of the cone is emptied)

D] Pipe C is open for 19 hours 50 minutes and pipe A and B are opened for 20 hours each
Work done

$20\left(\frac{1}{8}\right) + 20\left(\frac{1}{12}\right) - \frac{39}{2}\left(\frac{1}{4}\right)$

$\Rightarrow \frac{5}{2} + \frac{5}{3} - \frac{39}{8}$

$$\Rightarrow \frac{60 + 40 - 117}{24} = \frac{-17}{24} \text{ (which means } \frac{17}{24} \text{ of the cone is emptied)}$$

Hence, [D].

77. According to chart 2A, there are only 2 people who have undergone more than 17 days training. One has undergone 18 days training and the other has undergone 20 days training.
If we now compare the values obtained of Days of Training undergone in chart 2B, there are only 2 corresponding values of 18 days and 20 days for survey 1. The Employee effectiveness score corresponding to these values is about 8.75 and 8 for 18 and 20 days training respectively.
Correspondingly, the bonus received for a person having employee effectiveness score of 8.75 is 20.5 and for 8 is 18.5.

Average bonus for these 2 employees is $\frac{20.5 + 18.5}{2} = 19.5$

Hence, [D].

78. According to chart 1, Employees 1, 4, 5 and 7 have an Employee Effectiveness Score of greater than 7 in survey 1.
Now if we observe chart 3B, there are only 3 employees having bonus less than 20 lacs. They have employee effectiveness scores of about 4.25, 5.5 and 7.25.
Employees 1, 4, 5 and 7 have approximate employee effectiveness scores of 8.5, 5.5, 6.5 and 4.25 respectively. So, only employees 4 and 7 satisfy the required condition. Hence, [A].

79. From survey 1 to survey 2, there are 4 employees who underwent more days of training. One employee's training increased from 10 to 21 days, the 2nd employee's training from 12 to 15 days, the 3rd from 13 to 25 days and the 4th from 17 to 26 days.
The employee with 10 days of training survey 1 has an Employee Effectiveness Score of 5 in that survey. The employee with 21 days of training in survey 2 has an employee effectiveness score between 9-10.
These scores correspond to employee 2.
The employee with an employee effectiveness score of around 5 in survey 1 receives a bonus of 27.5 lakhs.
For survey 2 the bonus corresponding to an employee effectiveness score of between 9-10 is around 22 lakhs. So for employee 2, bonus has decreased.
The employee with 12 days of training in survey 1 has an employee effectiveness score of somewhere between 4-5.
Similarly for 15 days of training in survey 2, employee effectiveness score is between 7-8. These scores correspond to employee 3. An employee effectiveness score of between 4-5 in survey 1 corresponds to a bonus of 15.5 lakhs in survey 1. An employee effectiveness score of 7-8 in survey 2 corresponds to a bonus of around 13.5 lakhs. So for employee 3, bonus has decreased.
13 days of training in survey 1 has an employee effectiveness scores around 7 and 25 days of training in survey 2 corresponds to an employee effectiveness score of around 4. These scores correspond to employee 7.
Corresponding to an employee effectiveness score of 7 in survey 1 is a bonus amount of 12 lakhs and corresponding to an employee effectiveness score of 4 in survey 2 is a bonus amount of Rs.25 lakhs. So for employee 7, the bonus amount has increased.
17 days of training in survey 1 corresponds to an employee effectiveness score of 9-10 and 26 days of training in survey 2 corresponds to an employee effectiveness score of 8-9. These scores correspond to employee 1. Bonus amount corresponding to an employee effectiveness score of 9-10 in survey 1 is about 31.5 lakhs and bonus amount corresponding to an employee effectiveness score of 8-9 in survey 2 is around 35.5 lakhs. So, for employee 1 the bonus amount is increasing.

So only for 2 employees number of days of training increased but the bonus decreased. Hence, [B].

80. As can be seen from the solution to the previous question, for employee 2 and employee 3, the number of days of training has increased with an increase of employee score rating by at least 1.0, whereas for employee 1 and employee 7, the score has decreased. Hence, [A].

81. Sum of votes in 2005 = 880000
Sum of votes in 2010 = 985000

Approximate vote share of A in 2005 = $\frac{343200}{880000} \cong 39\%$

Approximate vote share of A in 2010 = $\frac{364450}{985500} \cong 37\%$

Approximate vote share of B in 2005 = $\frac{154000}{880000} \times 100 = 17.5\%$

Approximate vote share of B in 2010 = $\frac{241325}{985000} \times 100 = 24.5\%$

Approximate vote share of C in 2005 $\Rightarrow \frac{123200}{880000} \times 100 = 14\%$

Approximate vote share of C in 2010 $\frac{162525}{985000} \times 100 = 16.5\%$

Approximate vote share of D in 2005 = $\frac{48400}{880000} \times 100 = 5.5\%$

Approximate vote share of D in 2010 = $\frac{54175}{985000} \times 100 = 5.5\%$

Approximate vote share of E in 2005 = $\frac{30800}{880000} \times 100 = 3.5\%$

Approximate vote share of E in 2005 = $\frac{49250}{985000} \times 100 = 5\%$

As we can see share of B has increased most i.e. 7% followed by C which is 2.5% and E which is 1.5%. Share of D has remained the same and that of A has decreased. So the correct order is BCEDA. Hence, [D].

82. The total number of Tweets and percentage of Neutral Tweets is given below for 4 parties B, C, D and E.

Party	Percentage of Neutral Tweets	Total No.of Tweets
B	39.9%	1,08,128
C	40.9%	96620
D	33.3%	41524
E	37.4%	32724

By observation we can see that total number of Tweets is highest for Party B and Percentage of Neutral Tweets is also just 1 percentage point less than that of Party C, (which has the highest percentage of neutral tweets).

However total number of tweets for C is approximately 12000 or 10-12% less than that of Party B. We do not need to check for Party D and Party E as their total number of tweets as well as percentage of neutral tweets is lower than that of Party B. Hence, [A].

83. Total number of votes in 2000 = 785000
Percentage break up of votes in 2000 and 2010

Party	% votes in 2000	% votes in 2010
A	42	37
B	17	24.5
C	25	16.5
D	3.5	5.5
E	< 2	5

Party D's votes increase form 3.5% to 5.5%.
So gain in vote share is 2%.
Party B's votes increase from 17 to 24.5%, so gain in vote share is 7.5%
Party E's vote share from 2000 to 2010 can increase by more than 3% to slightly less than 5%, so 3.5% and 4.5% are both possible.
Only 2.5% increase is not possible
Hence, [B].

84. This question can be solved with approximation. Percentage tweets for Party B is slightly more than 25%, for Party C it is between 22%-23%, for Party D it is slightly less than 10%, for Party E it is between 7-8% and for other Parties it is below 4%.
Now using data of percentage votes from the previous answer, the difference in percentage tweets and percentage votes in 2010 will be highest for other parties (approximately 12.5 – 4 = 8.5)
Hence, [E].

Part B GENERAL AWARENESS

1. From the given cities, Mumbai is least likely to experience a cyclonic disturbance. Hence, [A].

2. From the given towns, Brahmapur is not associated with coal/lignite mining. Hence, [E].

3. All the given options are well-known industrial belts in India. Hence, [D].

4. Russia supplies gas to Ukraine and not vice-versa. Thus i is wrong. In a referendum, nearly 95% of voters in Crimea decided to be a part of Russia and not Ukraine. Thus iv is also wrong. Hence, [B].

5. All the statements except iv are correct about the Syrian crisis. Hence, [E].

6. Brazil shares the longest border with Bolivia. Thus all the statements except iv are correct. Hence, [D].

7. Ji Xinping, Tony Abbott, Joachim Gauck, David Johnston and Shinzo Abe all visited India in 2014. Hence, [A].

8. The name *Boko Haram* is usually translated as 'Western education is forbidden'. Hence, [A].

9. *Taxila* or *Takshashila* is an important archaeological site in the Rawalpindi District of Punjab, Pakistan. Hence, [D].

10. The *Mangalyaan* was successfully launched by ISRO from Sriharikota. Hence, [A].

11. The number of unorganised labour in India is more than the number of organized labour in India. Hence, [B].

12. The Cyclone Hudhud was named after Hudhud which is the national bird of Israel. Hence, [A].

13. The correct list of sportsperson who won gold medal at the Incheon Asian Games is Jitu Rai, Yogeshwar Dutt, Tintu Luka and Mary Kom. Hence, [A].

14. As per the 2011 Census, the second most urbanised state (in percentage terms) in India is Tamil Nadu. Hence, [D].

15. Christine Lagarde is the Managing Director of the International Monetary Fund. Hence, [C].

16. The correct order of the cricketers according to the descending order of test wickets taken are A. Kumble, GD McGrath, CA Walsh, SM Pollock and Wasim Akram i.e., i, iii, ii, iv, v. Hence, [C].

17. The nations in the decreasing order of rice production are India, Indonesia, Bangladesh, Philippines and Brazil i.e., iii, iv, i, v, ii. Hence, [E].

18. Thee Tennis Grand Slams in the order of their occurrence in a calendar year are Australian Open, Wimbledon, French Open and US open i.e., i, ii, iv, iii. Hence, [C].

19. The dynasties in the correct chronological order are Chola Dynasty, Kushana Dynasty, Pallava Dynasty, Chalukya Dynasty, Pala Dynasty and Hoysala Dynasty. Hence, [A].

20. The Bahujan Samaj Party contested the maximum number of seats (500 out of 543), followed by the Congress (440) and the Bharatiya Janata Party (433). Hence, [C].

21. The teams associated with the Indian Super League are Atletico de Kolkata, Chennaiyin FC, Delhi Dynamos FC, FC Goa, FC Pune City, Kerala Blasters FC, Mumbai City FC and Northeast United FC. Thus both [B] and [C] are correct. Hence, [B] or [C].

22. The correct match is a-iv, b-ii, c-iii, d-v and e-i. Hence, [B].

23. According to the Union Budget 2014, the Current Account Deficit was around 1.7% of the GDP. Hence, [D].

24. 100 smart cities have been announced in India. Hence, [E].

25. Qualified Institutional Placement allows an Indian-listed company to raise capital from its domestic markets. Hence, [D].

26. Quantitative Easing is an unconventional monetary policy in which a central bank purchases government securities or other securities from the market in order to lower interest rates and increase the money supply. Hence, [D].

27. *Bachpan Bachao Andolan* is an India-based movement campaigning for the rights of children. Hence, [C].

28. All except Arundhati Roy have been awarded the Pulitzer Prize. Hence, [E].

29. Honeycomb, KitKat and Lollipop are the correct names of Android Operating Systems. Hence, [E].

30. All the movies except *Swadesh* were nominated for the Academy Awards in the Best Foreign Language Film category. Hence, [D].
(Note: *Water* was nominated from Canada for the Best Foreign Language Film category.)

Part B ESSAY

"Listening is a dying art. We hardly listen to understand, we only listen to refute or reply."

If student is arguing against the topic, pointers can include the fact that mankind has not changed fundamentally over the years. Therefore, this topic cannot be applicable only to the present generation. Examples may include classroom lectures and training sessions where students listen to absorb information and understand concepts – not necessarily only to refute or reply.

If student is arguing in favour of the topic, pointers may include technologies such as satellite television, the World Wide Web and smart phones for having succeeded in shortening peoples' attention spans to such an extent that people have lost the ability to be patient and thereby listen to what others have to say. Therefore, we only listen when we have a point to make of our own – that is to refute or to reply.