

**XAT-2013**  
**EXPLANATORY**  
**ANSWERS**

**SECTION-A**

1. Though at first glance it may seem that both statements 1 and 2 make similar points, neither of them follows from the other. Since the particular law/laws in question is/are never specified, we cannot tell whether they refer to the same thing. Therefore, the best answer is [E]: statements 1 and 2 are independent. Hence, [E].
2. According to statement 1, the fruits of publicly financed science should be freely available. Statement 3 shows how knowledge can be freely and more easily distributed due to the Internet. So 3 is a facilitating condition for 1. Note that 2 is not directly related to either 1 or 3. Hence, [B].
3. Statements 2 and 3 make similar points about the problems with capitalism, so they may be dependent, but are not necessarily so. Statement 1, which is about business schools, is not related to either 2 or 3. Hence, [C].
4. The first and second blanks introduce 'a wolf' and 'a lamb'. Thus, indefinite articles will be used to fill the blanks. Since the lamb has gone astray from a particular fold, we need to use the definite article 'the' in the third blank. The wolf and the lamb have already been introduced and we are referring to those particular animals only. Hence, 'the' is used for both the last two blanks. Thus the correct sentence is: 'A wolf, meeting with a lamb astray from the fold, resolved not to lay violent hands on him, but to find some plea to justify to the lamb the wolf's right to eat him'. Hence, [A].
5. The first blank will have an indefinite article as we are not talking about a particular 'bat' but just introducing it in the sentence. 'Ground' will be preceded by 'the' as it represents a particular locality in relation to the bat. 'A' is used in the third blank as we are introducing a new character i.e., 'weasel'. 'The' is used in the fourth blank and sixth blank as we have already mentioned the weasel and bat respectively. Since 'enemy' represents a class of animals, 'the' is used to fill the fifth blank. In the next part, 'bird' and 'mouse' are used in a general sense, and do not refer to particular individuals. Thus, an indefinite article precedes these singular countable nouns. The correct sentence is: 'A bat who fell upon the ground and was caught by a weasel pleaded to be spared his life. The weasel refused, saying that he was by nature the enemy of all birds. The bat assured him that he was not a bird, but a mouse, and thus was set free'. Hence, [D].
6. The correct phrase is 'to get downstairs' which means 'to descend to a lower floor'. The phrase 'as usual' means 'habitual or customary'. The third blank talks about eating his meals; 'little' correctly fits the third blank. The correct phrase is 'to help oneself out of something' which means 'to take something'. Thus, 'out of' meaningfully completes the fourth blank. The correct phrase is 'to blow through your nose' which means 'to clear or empty the nose by forcing air through it'. 'Dared' should be followed by the preposition 'to'. Thus the correct sentence should be: 'He got downstairs next morning, to be sure, and had his meals as usual, though he ate little and had more, I am afraid, than his usual supply of rum, for he helped himself out of the bar, scowling and blowing through his nose, and no one dared to cross him.' None of the options are correct in terms of the given order. However, it is possible

- that there is a misprint in [C] and that it was actually meant to read ‘Downstairs, as, little, out of, through, to’, in which case, [C] would be the answer.
7. Statement 2 is about the narrator hiding behind a bush. In 1, he has just gotten into position, and sees some men arriving. In 3, he describes three of the men. In 4, the pronoun ‘his’ refers to ‘the blind beggar’ in 3. Thus we get the sequence 2, 1, 3, 4. Hence, [B].
  8. Statement 2, which introduces the situation, is the opening sentence. The ‘pistol flash’ in 5 is the ‘last signal’ mentioned in 3, so we get the 5-3 link. 4 follows from 3, as ‘him’ in 4 refers to Pew, mentioned in 3. 1 continues the same point as 4. Thus we get the sequence 2, 5, 3, 4, 1. Hence, [C].
  9. Though the word ‘however’ might lead you to believe otherwise, 4 is the only suitable opening sentence in this paragraph, as it introduces the historians of science and their endeavour. The 1-3 link is clear: the ‘questions’ mentioned in 3 are the ones given at the end of 1. Statement 2, which mentions an additional problem, forms the conclusion. Thus the sequence is 4, 1, 3, 2. Hence, [E].
  10. The sentence talks about the attributes required to be a good manager. Thus, the use of ‘demands’ in [A] and [C] changes the parallel structure of the attributes listed. The simple present tense is used to indicate a general truth. Thus, ‘requiring’ is incorrect in option [D]. The use of ‘but’ in option [E] is incorrect. The correct sentence is: ‘To be a great manager requires strong inter-personal skills, the ability to think fast and a can-do attitude’. Hence, [B].
  11. The first part of the italicised sentence ‘while standing still’ does not have a doer while the second part has a doer. Thus, there is a dangling modifier error in options [A] and [D]. Option [C] has an error of parallelism. The second part of the phrase (a person who is travelling) has to be preceded by ‘to’. Option [E] uses different forms of the verbs: present participle (‘standing’) and simple present tense (‘travels’). Thus, this option is also eliminated. The correct sentence is: ‘The tremendous insight of Einstein was that the passage of time does not appear to be the same to a person standing still as to a person travelling at a speed which is a significant fraction of the speed of light’. Hence, [B].
  12. In the italicised part, the savings from personal incomes are mentioned. Since ‘savings’ is plural, ‘have’ is the correct form of the verb to be used. Thus, [A] and [B] are eliminated. Option [C] is grammatically incorrect as ‘extent’ needs to be followed by a preposition, and the tense is incorrect. ‘By the instability’ later in the sentence implies that the sentence is in the passive not active voice. So the correct form of the verb should be ‘have been shifted’, not ‘have shifted’. Thus the correct sentence is: ‘Economic theory fails to explain the extent to which savings from personal income have been shifted to short-term bonds, money-market funds, and other near-term investments by the instability in the futures market’. Hence, [E].
  13. Refer to the definition of *karma* in the first paragraph, especially this part: ‘[s]he reaps the fruit of those actions in those very bodies or embodiments (in future existences)’. ‘Those very bodies’ would imply the same lifetime, while ‘embodiments in future existences’ would imply future births. Whether that birth would be in human form or not is not stated. So the phrase ‘future existences’ could refer to next birth in human form or in any embodiment, i.e. either 2 or 3. Hence, [B].

14. Refer to the definition of *karma* given at the beginning of the passage: essentially, it asserts that people's actions have consequences that they will feel in the future. So the conclusion that long-term consequences are important follows logically from this assertion. Thus statement 1 is correct. Statement 2, which indicates a mere possibility not a certainty, does not follow. Hence, [A].
15. The first premise is that since lower expectations lead to greater satisfaction, people have the incentive to strategically lower their expectations. [A] does not contradict this premise – it merely changes the cause-effect relationship. [B] makes no sense whatsoever. [D] and [E] are irrelevant to the premise. But [C], which states that satisfaction is not dependent on expectations, contradicts the premise. Hence, [C].
16. According to the second premise, people with a long-term orientation are unlikely to change their expectations simply in order to feel better temporarily. The definition of *karma* in the first sentence of the passage implies that those who believe in it would have a long-term orientation. So it can be said that temporary feelings and the law of *karma* are incompatible, and even contradictory. So statement 3 is valid, and statement 1, which contradicts it, is invalid. Statement 2 is a misunderstanding of the second premise. Therefore, only 3 is correct. Hence, [D].
17. According to the passage, people who have disconfirmation sensitivity would be more satisfied when products perform better than expected, and more dissatisfied when products perform worse than expected. However, based on the limited information provided in the example, it is not possible to tell whether or not the manager has disconfirmation sensitivity, since we do not know what his initial expectations were. Also, he may have rated the quality of the food as 'excellent' simply to be polite, or for any other unrelated reason. So the best answer is [C]. Whether or not he believes in *karma* is irrelevant to this example. Hence, [C].
18. According to the passage, Fermi calculated the minimum yield of the atomic blast based on how far the blast wave carried the confetti. Option [A] describes a similar situation: you can calculate an explosive force (the pressure inside the cooker) based on the distance travelled by a fragment. [B] and [C] measure the average potency, not the minimum potency. [D] talks about measuring the volume of water in a tank, which is a very different type of quantity than an explosive force. Therefore, only [A] is an analogous situation. Hence, [A].
19. The examples of Fermi's calculations given in the passage make no mention of calculating a maximum or average, so [C] and [E] can be ruled out. Calculating a minimum applies only in case of one example (the atomic blast one), not the other (the piano tuners one), so [B] cannot be generalized. Based on the last paragraph, we can infer that Fermi used quick estimates to calculate a range of values or an approximate value. However, there is no suggestion that such a guess would necessarily be more useful than existing values. Therefore, [A] can be ruled out, and only [D] is a suitable answer. Hence, [D].
20. Statement 1 contradicts the point of the example in the last paragraph. Statement 3 is too specific; also it refers to an example not found in the passage. Statement 4, on the other hand, is too general: it is possible to infer from the passage that Fermi was a genius, but this is not its central idea. Only statement 2 sums up the central idea, which is that any kind of physical quantity, can be estimated using quick, off-the-cuff calculations. Hence, [D].

21. There is no information in the passage that suggests either statement 1 or 2 is true. Though the yield of the atomic blast mentioned in the passage is measured in kilotons, we cannot tell whether this is the only unit the yield can be measured in, so statement 3 cannot be inferred either. Hence, [E].
22. Should be [E]
23. According to Popper, a single negative instance would result in the falsification and therefore rejection of a universal belief, while no matter how many positive instances we find to support a universal belief, there is always a possibility that a negative one may be found in the future, so we cannot definitely verify it. This is the asymmetry between falsification and verification. But, according to the second paragraph (where the quoted sentence occurs) this asymmetry is not necessarily correct, as the negative instance may itself be rejected. So falsification is not necessarily better at rejecting scientific beliefs than verification is at accepting them. Hence, [E].
24. Refer to the last paragraph. The author states that though falsifications are not necessarily conclusive, they are still better at disproving scientific claims than verifications are. Hence, [D].
25. In the final paragraph, the author agrees with Popper (with some reservations) that falsification – even though it may not always be conclusive – gives us an appropriate reason for rejecting a scientific belief. Hence, [A].
26. According to the passage, Soros distrusts neo-classical economics – and in the penultimate paragraph, the author agrees with him, so [A] cannot be inferred. In the first paragraph, the author differentiates between free market capitalism (which Soros rejects) and the open society (which Soros promotes), so [C] is untrue. Options [D] and [E] cannot be inferred as the author does not explicitly discuss laissez-faire. Though option [B] is a little too strong, it is the only inference that has a basis in the passage – see paragraphs 4 to 6. Hence, [B].
27. Refer to the fifth paragraph, the last sentence: option [D] is clearly stated. [E], which contradicts it, is therefore wrong. [A] and [C] cannot be inferred from the passage, while [B] is contradicted by the description of Soros’s open society in the first three paragraphs. Hence, [D].
28. Options [A] and [B] contradict Soros’s views, while [D] and [E] cannot be inferred. Refer to paragraph 3: Soros believes that the state should be allowed to do anything, ‘provided it does not settle into any one policy firmly, unbendingly’. Hence, [C].
29. Refer to paragraph 2: ‘critical rationalism may be undermined by the openness of the open society’. So [C] is incorrect. Options [A], [B] and [D] have no basis in the passage. Hence, [E].
30. The word ‘deterministic’ refers to the philosophical doctrine that every state of affairs is the inevitable consequence of the antecedent states of affairs. Thus, the cause(s) of any effect can always be known. Hence, [D].

**SECTION-B**

31. Using statement I alone

We can find the actual sales for the bookstore, super market and online store as the total sales is given. Additional costs for each kind of store can be found because the proportion in which the red, yellow, green and violet costs are apportioned for each kind of store can be found. But, we do not know how initial costs are allocated among the three stores. So, contribution and hence profit/loss cannot be calculated.

∴ Statement I alone is not sufficient to calculate profit/loss.

Using statement II alone

We don't know the ratio of sales by three stores. Hence, a profit/loss cannot be calculated.

∴ Statement II is not sufficient to calculate the profit/loss.

Using the two statements together, the actual sales as well as the ratio of initial cost, contribution and additional costs can be calculated and hence profit/loss can be calculated. Hence, [C].

32. Total online store costs is the sum red, yellow, green and violet costs. Same is the case for book store costs and super market cost.

Total Red cost = 5500.

Since the online store contributes 200 out of 275 costs in the red cost.

$$\text{Online} = \frac{200}{275} \times 5500 = 4000$$

Similarly, the colour-wise cost for each kind of store can be found as shown below:

	<b>Online</b>	<b>Super Market</b>	<b>Book Store</b>	<b>Total</b>
Red	4000	1300	200	5500
Yellow	1550	620	930	3100
Green	3000	1260	540	4800
Violet	1500	630	270	2400
<b>Total</b>	<b>10050</b>	<b>3810</b>	<b>1940</b>	

Now, sales of online store = 50% of 60000 = 30000

super market sales : book store sales = 1 : 2

∴ Super market sales = 1/3rd of 30000 = 10000 and book store sales = 20000

The total initial cost of 39000 needs to be split up in this ratio.

So, the profit for each format can be calculated as shown below:

	<b>Online</b>	<b>Super Market</b>	<b>Book Store</b>
Sales	30000	10000	20000
Initial Costs	19500	6500	13000
Contribution = Sales – Initial Costs	10500	3500	7000
Additional Costs	10050	3810	1940
Profit = Contribution – Additional Cost	450	-310	5060

Thus, the profit from “online” sales is 450.

Hence, the correct answer is option 4. Hence, [D].

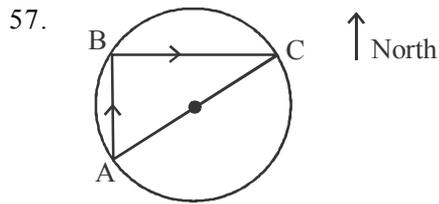
33. From the solution to the previous question. The super market format is the format that yields the least profit. Hence, [B].
34. From the solution to question 32, the book store format is the format that yields the least profit. Hence, [B].
35. Many students sitting next to each may give correct answers for multiple questions. However, there are six choices and many students sitting next to each other and giving the same incorrect answers for multiple questions is highly improbable and it is highly possible that this was because the students cheated. However, there can be a little error in judgement. Hence, [C].
36. Probability of selecting the correct answer by a good student is 0.2.  
Therefore, probability of selecting a wrong answer or not attempting the question by a good student is  $1 - 0.2 = 0.8$ .  
∴ Probability of selecting a wrong answer by a good student is less than 0.8, but we do not know its exact value. Thus, the answer cannot be calculated. Hence, [E].
37. Only statements V and VII talk about some definite numbers  
Therefore, at least one of these two statements must be true to know the exact numbers.  
Thus, only option C, D or E can be correct.  
Also, given that few students were absent.  
Therefore, at least two students were absent and thus the maximum number of students can only be 13.  
From option [C], we get a definite number of students for sections A, B, C and D as 5, 4, 3 and 1 respectively.  
For option [D] and [E], exact number of students cannot be found. Hence, [C].
38. First student's guess → A B C D E (students' names initial letter shown)  
Second student's guess → D A E C B  
From the given observation for second student's guess, we can note that the given observation is true only if the two correct guesses of positions are first two ranks or last two ranks. For any other two ranks assumed to be right, some observation(s) will be found to be wrong.  
Case I: If D and A are at correct positions.  
Then either EC or CB is correct order (as one of the correct order pairs is DA)  
∴ Rank order can be DABEC or DACBE  
In DABEC, A is followed by B which cannot be true.  
In DACBE, C is at third rank which cannot be true.  
Thus, the two correct positions guessed are not the first two ranks.  
Case II: If C and B are at correct positions.  
Then either DA or AE is correct order (as one of the correct order pairs is CB)  
∴ Rank order can be AEDCB or EDACB  
AEDCB cannot be the correct order because A cannot be at 1st position.  
Thus, EDACB is the correct order of ranks.  
Only option [A] is true. Hence, [A].

39. 'People's latent anger against corruption' was the biggest reason for Shambhu's initial success. So, any option that doesn't contain this reason can be the answer. Only [B] doesn't contain this. It also doesn't contain 'Shambhu's moral courage', which is the other reason for his success. Hence, [B].
40. The case doesn't give any evidence to support [D] and [E]. [A] is not the best answer as according to the case, the common man had become sick and tired of the government's inaction against corruption long ago. This was nothing new. The last few lines of the case seem to dispute [B] as they mention that Shambhu was infuriated and was planning another nation-wide protest. This doesn't seem to indicate that he lacked energy. There is some information in support of [C]. The penultimate paragraph states that Shambhu was spreading the message that only citizens with an unblemished character should be allowed to hold a public office. This could have been perceived by people as being a very high standard. Hence, [C].
41. Ethics are different from cost-benefit analyses. Events are not described as ethical or unethical based on the losses or benefits incurred. If the minister allocated water resources at incorrect prices and received kickbacks, his actions cannot be called ethical no matter what good came out of them. Hence, [E].
42. Mr. Swamy has to comment on the minister's opinion about the media. So, [C] and [D] cannot be the answer. All we know about the media's involvement is what is given in question 41, i.e., media reports suggested that the minister had deliberately allocated the water resources at old prices to the new companies, and in return received some kickbacks. Here the media is not acting like a judge. So, [B] seems to be the most appropriate answer for an independent observer to give. Hence, [B].
43. Only the corporate managers and minister should be considered guilty. The Head of the nation doesn't seem to have known about the wrongdoing before and when he came to know about the allocation process, he suggested a fresh round of bidding. In any case, no charges have been levied against the Head of the nation and there is no proof of his guilt. Hence, [E].
44. [C] gives a credible explanation for why the share prices of Bank of Bharat increased even though retail customer accounts decreased. If [C] is true then BoB's customer base was actually not declining; only its composition was changing. Hence, [C].
45. [A] is a completely valid reason for why doctors may not have embraced the surgery; if the surgery could cause serious complications and even death, then doctors are bound to not recommend it. Hence, [A].
46. Clearly, 3 and 4 are very extreme steps, and out of 1, 3 and 4, only one step should be taken. So, the option that leaves out 3 and 4 is the best. This narrows down our choice to [A] and [D]. 2 is the first step as till now Marathe has just got some second hand information. He needs to verify this information before deciding what to do with Kale. Assuming that he is able to verify this information, he can make a suggestion to Kale to see a counselor. The transfer would take more time to effect, so it should be the third step. Hence, [D].

47. The only solution related to a personal problem is 5. So, if Marathe takes Lakhote's advice, 5 would be done away with. Hence, [E].
48. The decision to sack Kale would be taken because of his inability to work well in a team, as this is the point that has been stressed on the most in the case. So, [A], [B] and [E], which do not relate to this, get eliminated. [D] would not be of concern as, if an employee is being fired, then the company wouldn't care whether he would be able to adjust to a new location. [C] is the answer as it shows that Kale's problem is fairly common and so, such an extreme measure (of sacking him) is not warranted. Hence, [C].
49. Obviously, 'appreciation by superiors' isn't a logical reason for declining performance. Hence, [E].
50. 1 is the most appropriate solution to the stated problem and 4 is completely unrelated to the problem. So, an option that has 1 but not 4 should be the answer. Only [A] has this combination. 2 is also relevant as this will present a new challenge to Vardarajan. Though 3 is just a temporary escape from the problem, as there is no other option, [A] should be marked. Hence, [A].
51. As the question is about creating a better organization, not about what to do with Vardarajan, only [B] can be the answer. Hence, [B].
52. As the guilty parties have not yet been identified, [A] and [B] cannot be the answer. Both [C] and [D] are relevant as the problem has to be sorted out and the impact on the affected parties (i.e. recruiters) also has to be considered. Hence, [E].
53. [A] is too extreme and [C] is unethical. [B] is not a solution to the problem at hand and the contact in the college may not have the correct information. As the President and possibly some members of the SPC have also been implicated, [D] is the best option. The college can be trusted to send correct information. Hence [D].
54. As the question is about getting further information about pay packages of the graduating students, [A] and [C] are irrelevant. The President of SPC is the person who will have the required information. The senior has also advised contacting the student body directly. So, [D] is more appropriate than [B] (as the question doesn't specify that you know about the scandal). [E] is very vague: your Facebook friends may not be from this college. Hence, [D].
55. [B] and [C] would be wrong. Disregarding the phone call is fine but [A] also mentions not telling anyone, which is unwarranted. Constituting a committee to investigate the phone call seems to be an extreme step. [D] seems the most appropriate. Hence, [D].

**SECTION-C**

56. Time required to go one way in auto =  $\frac{30}{2} = 15$  minutes  
 $\therefore$  Time required to go one way walking =  $90 - 15 = 75$  minutes  
 $\therefore$  Time required to go both ways walking =  $2 \times 75 = 150$  minutes  
Hence, [D].



Let, the fish started from point A to point B in north and then swam along path BC.  
 $\therefore$  AC is the hypotenuse of the right angled triangle ABC and it is also the diameter.  
 $\therefore (AB)^2 + (BC)^2 = AC^2 \Rightarrow AC^2 = (300)^2 + (400)^2 \Rightarrow AC = 500$  feet

$\therefore$  Area of the circular pool =  $\pi \left(\frac{500}{2}\right)^2 = 62500\pi$

Hence, [A].

58. For elder son, Rs.  $\frac{15}{2} = 7.5$  lakhs will become 21 lakhs in 6 years

If  $r_1$  is the rate of interest for elder son,  $7.5 \left(1 + \frac{6r_1}{100}\right) = 21$

$7.5 \times \frac{6r_1}{100} = 13.5 \Rightarrow r_1 = 30\%$

Similarly, if  $r_2$  is the rate of interest for younger son

$7.5 \left(1 + \frac{9r_2}{100}\right) = 21 \Rightarrow r_2 = 20\%$ .

Hence, [E].

59. Time taken by Albela, Bob and Chulbul to read a page is in ratio 2 : 3 : 4  
 $\therefore$  If time taken by them is same, the number of pages they read will be in the ratio

$\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$  i.e., 6 : 4 : 3

$$\therefore \text{No. of pages read by Bob} = \frac{4}{6+4+3} \times 78 = 24$$

Hence, [A].

60. Money spent on taxi =  $2 + (10 - 2) \times 5 + (14 - 10) \times 8 = 20 + 40 + 32 = 92$   
 $\therefore$  Money spend on bullock-cart = 102.92 = Rs.10

$$\therefore \text{Distance travelled in bullock-cart} = \frac{10}{2} = 5 \text{ km}$$

$$\therefore \text{Distance of Sardar Khan's home from railway station} = 14 + 5 = 19 \text{ km}$$

Hence, [C].

61. Arithmetic Mean  $\geq$  Geometric Mean

$$\therefore \frac{a^2 + a + 1}{3} \geq (a^2 \times a \times 1)^{\frac{1}{3}}$$

$$\therefore \frac{a^2 + a + 1}{3} \geq (a^3)^{\frac{1}{3}} \Rightarrow \frac{a^2 + a + 1}{3} \geq a$$

$$\Rightarrow \frac{a^2 + a + 1}{a} \geq 3 \text{ (Since } a \text{ is a positive number)}$$

$$\therefore \left( \frac{a^2 + a + 1}{a} \right) \left( \frac{b^2 + b + 1}{b} \right) \left( \frac{c^2 + c + 1}{c} \right) \left( \frac{d^2 + d + 1}{d} \right) \left( \frac{e^2 + e + 1}{e} \right) > 3^5$$

$$\Rightarrow \frac{(a^2 + a + 1)(b^2 + b + 1)(c^2 + c + 1)(d^2 + d + 1)(e^2 + e + 1)}{abcde} \geq 243$$

Hence, [E].

62. Let the six integers in increasing order be a, b, c, d, e and f

$$\therefore \frac{c+d}{2} = 18 \Rightarrow c+d = 36$$

Also, we need to maximize f, therefore a and b will be lowest possible positive integers i.e. 1.

$$\therefore a + b + c + d = 1 + 1 + 36 = 38$$

Given that mean of the six integers is 15

$$\therefore a + b + c + d + e + f = 15 \times 6 = 90$$

$$\therefore e + f = 90 - 38 = 52$$

Now e should be more than d and minimum value of d is 19 ( $\because$  c cannot be equal to d as there is only one mode)

$$\therefore \text{Minimum value of } e = 20, \text{ which means maximum possible value of } f \text{ is } 52 - 20 = 32.$$

Hence, [D].

63. Ramesh had 3 apples and 3 oranges. He required one orange less to extract the same quantity. A juice as extracted from apples. Therefore, he required 2 oranges to extract equal quantity

of juice as extracted from 3 apples.

$$\therefore \text{Percentage of orange juice in the mixture} = \frac{2+1}{3+2} = 60\%$$

$$\therefore \text{Percentage of apple juice in the mixture} = 40\%$$

Hence, [E].

64. Maximum number of invitees will be when exactly two of Sara's friend are connected to each other and no other friends of Sara's friends are common.

$$\therefore \text{Maximum number of invitees} = \underbrace{5 \times (25 - 1)}_{(25 - 1) \text{ since one friend is Sara}} + \underbrace{5}_{5 \text{ friends of Sara}} - \underbrace{2}_{\text{the 2 friends which are directly connected}} = 123$$

Minimum number of invitees will be when there are exactly 26 people and each of them is connected to each of other 25 people. Thus, only option [B] satisfies the found range.  
Hence, [B].

65. Percentage of students who do not play Football, Cricket, Basketball, and Carrom are 30, 25, 20 and 15 respectively.

$$\therefore \text{Maximum percentage of students who do not play at least one of the games} = 30 + 25 + 20 + 15 = 90$$

$$\therefore \text{Minimum percentage of students who play all four games} = 100 - 90 = 10$$

Hence, [B].

66.  $p^q = q^p$  and  $q = 9p$

$$\therefore p^{9p} = (9p)^p$$

$$(p^p)^9 = p^p \cdot 9^p \Rightarrow (p^p)^8 = 9^p \Rightarrow (p^8)^p = 9^p \Rightarrow p^8 = 9 \Rightarrow p = \sqrt[8]{9}$$

Hence, [D].

67. When the Hari got off the car, let the distance travelled by Shyam be  $x$  and thus distance travelled by Ram and Hari =  $5x$

When Ram met Shyam, Shyam would have walked  $\left(\frac{5x - x}{6}\right) = \frac{4x}{6}$  distance more (also Hari

would have walked the same distance)

After that, time taken by Shyam = time taken by Hari

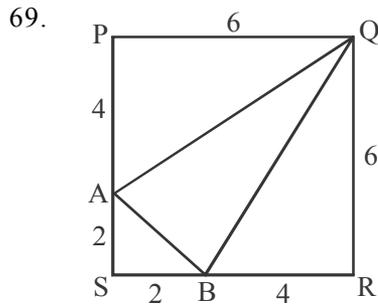
$$\Rightarrow \frac{\text{Distance travelled by Shyam}}{\text{Shyam's speed}} = \frac{\text{Distance travelled by Hari}}{\text{Hari's speed}}$$

$$\Rightarrow \frac{100 - \left(x + \frac{4x}{6}\right)}{25} = \frac{100 - \left(5x + \frac{4x}{6}\right)}{5} \Rightarrow x = 15$$

$$\therefore \text{Required time taken by Hari} = \frac{5 \times 15}{25} + \frac{100 - (5 \times 15)}{5} = 3 + 5 = 8 \text{ hours.}$$

Hence, [A].

68. Diagonals of a rectangle of different length and breadth are not at  $90^\circ$  with each other while the diagonals of a square intersect with each other at  $90^\circ$ . Therefore, such a rectangle and a square cannot have the same diagonals. Therefore, the question is incorrect.



$$\begin{aligned} \text{Area of } \triangle ABQ &= \text{Area of square PQRS} - \text{Area of } \triangle PQA - \text{area of } \triangle ASB - \text{area of } \triangle QRB \\ &= 6 \times 6 - \frac{1}{2} [4 \times 6 + 2 \times 2 + 4 \times 6] = 36 - 26 = 10 \text{ sq.units.} \end{aligned}$$

Hence, [C].

70. Divide the given range of numbers in groups of 100 i.e. 100-199, 200-299...and so on. Between 100-199, number of numbers with unit's digit as 2 is 10 and number of numbers with ten's digit as 2 is 10. But 122 is counted twice in this.  
 $\therefore$  Between 100-199, total number of numbers that contain '2' =  $10 + 10 - 1 = 19$   
 Similar will be the case for numbers in the ranges 300-399, 400-499,...and so on.  
 From 200 to 299, all the numbers will contain '2'.  
 $\therefore$  Required number of whole numbers =  $19 \times 6 + 100 = 214$   
 Hence, [B].

71. The value will be maximum when p, q and r are most evenly distributed (i.e. the numbers are closest to each other) i.e. when p, q, and r are 3, 4, and 3  
 $\therefore$  The maximum value of  $pq + qr + pr + pqr$  is  
 (consider  $q = 4$ )  
 $3 \times 4 + 4 \times 3 + 3 \times 3 + 3 \times 4 \times 3$   
 $= 12 + 12 + 9 + 36 = 69$   
 Hence, [C].

72. If 'xy' is a two digit number; the number is interesting if  $x + y + xy = 10x + y$   
 $\Rightarrow xy = 9x \Rightarrow y = 9$   
 $\therefore$  All two digit numbers with unit's digit 9 are interesting  
 Also, 100 is not an interesting number

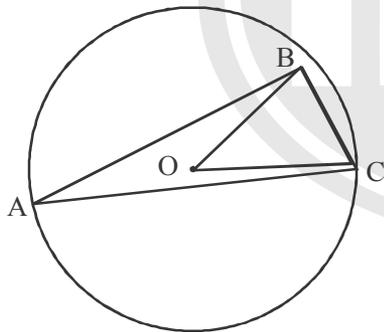
$$\therefore \text{Required fraction} = \frac{9}{91} = 0.099$$

Hence, [E].

73. Arun's first priority is to complete as many tasks as possible. We can see that 3 tasks can be completed in 10 days. Thus option [A] is ruled out.  
 Now, the tasks in order of priority are T1, T2, T4, T5, T3  
 Now, T1, T2 and T4 together take  $3 + 3 + 4 = 12$  days  
 Thus, option [D] is ruled out  
 Next, T1, T2 and T5 together take  $3 + 5 + 2 = 10$  days  
 Thus, option [B] is the correct answer. Hence, [B].

74. For option A:  
 Number of days required =  $3 + 5 + 3 = 11 > 10$   
 Thus, option [A] is ruled out.  
 For option B:  
 Number of days required for background research =  $3 + 5 + 3 = 11 > 10$   
 Thus, option [B] is ruled out.  
 For option C:  
 Number of days required =  $3 + 5 + 4 = 12 > 10$   
 Thus, option [C] is ruled out.  
 For option D and option E, both number of days required to complete the tasks and the number of days required for background research are less than or equal to 10.  
 But in option E, higher priority tasks are completed.  
 Hence, [E].

75.



Consider  $\Delta OBC$

$$OC = \sqrt{50} \cong 7.07$$

$$BC = 2$$

Sum of two sides of a triangle is greater than the third side

$$\therefore OB + BC > OC$$

$$\text{i.e. } OB > OC - BC$$

$$\text{i.e. } OB > 7.07 - 2$$

$$\text{i.e., } OB > 5.07$$

$$\therefore OB^2 > (5.07)^2$$

$$\therefore OB^2 > 25$$

Only option which is greater than 25 is [A]. Hence, [A].

76. Probability of not drawing a king,  $b = \frac{{}^4C_2}{{}^6C_2} = \frac{2}{5}$

Probability that at least one of the cards is king,  $a = 1 - \text{probability that none of the cards is king} = 1 - b = 1 - \frac{2}{5} = \frac{3}{5}$

$$\therefore \frac{a}{b} = \frac{\left(\frac{3}{5}\right)}{\left(\frac{2}{5}\right)} = \frac{3}{2} = 1.5$$

Hence, [E].

77. Substituting  $x = 1$ , we can check that  $b = 5, 6, 7$ , or  $8$  does not satisfy the given expression. Hence, [E].

78.  $x^5 - 1 = (x - 1)(x^4 + x^3 + x^2 + x + 1)$

$$x^5 = 1 + (x - 1)f(x)$$

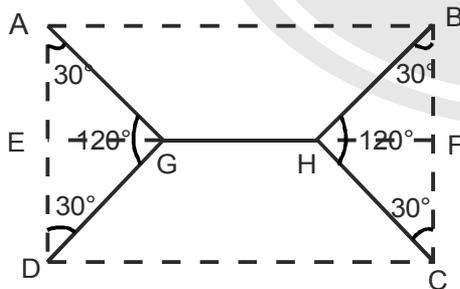
$$f(x^5) = f[(x - 1)f(x) + 1]$$

Each term in the expansion of  $f(x^5)$  will leave a remainder of 1 when divided by  $f(x^5)$

$$\text{Required remainder} = 1 + 1 + 1 + 1 + 1 = 5$$

Hence, [C].

79. The shortest possible road connecting all 4 points A, B, C & D is constructed as given below.



Now, in  $\triangle AEG$ ,  $AE = 5$  km,  $EG = \frac{5}{\sqrt{3}}$  km and  $AG = \frac{10}{\sqrt{3}}$  km

Shortest possible road =  $AG + GD + GH + BH + HC$

$$\Rightarrow 4 \times \frac{10}{\sqrt{3}} + \left(10 - 2 \times \frac{5}{\sqrt{3}}\right)$$

$\cong 27.32$  km. Hence, [B].

80. Statement I:  
7, 19, 73 and 103 are the prime factors of 1000027.  
Thus, statement I is false.  
Statement II:

Suppose  $a = \frac{\sqrt[6]{6!}}{\sqrt[7]{7!}}$

Taking 42<sup>th</sup> power in both numerator and denominator, we have

$$a = \frac{(6!)^7}{(7!)^6}$$

$$= \frac{6! \times (6!)^6}{7^6 \times (6!)^6}$$

$$= \frac{6!}{7^6}$$

$\therefore a < 1$

$\Rightarrow \frac{\sqrt[6]{6!}}{\sqrt[7]{7!}} < 1$

$\Rightarrow \sqrt[6]{6!} < \sqrt[7]{7!}$

Thus, the statement II is not correct.

Statement III:

Let  $y$  km/h be the speed required in the second half of the journey to attain an average speed of  $2x$  km/h for the entire journey.

$\therefore \frac{d}{x} + \frac{d}{y} = \frac{2d}{2x} \Rightarrow \frac{d}{y} = 0 \Rightarrow d = 0$  which is not possible

Thus, statement III is correct. Hence, [C].

81.  $f(f(x)) = 15$  will be true when  $f(x) = 4$  or  $f(x) = 12$ . From the graph,  $f(x) = 4$  four times, while  $f(x) = 12$  three times.  
Hence,  $f(f(x)) = 15$  has total of  $4 + 3 = 7$  solutions. Hence, [C].

**Answers to questions 82 to 84:**

Train Number	Start Time	End Time	Time Taken
1111	10:15 a.m.	12:30 p.m.	2:15
2222	11:15 a.m.	1:30 p.m.	2:15
4444	3:30 a.m.	6:30 a.m.	3:00
7777	8:00 p.m.	10:00 p.m.	2:00
9999	12:00 p.m.	2:15 p.m.	2:15

82. We need to find the time taken only for the five trains mentioned in the answer options. The start time, end time and time taken for these five trains is shown below:  
Thus, train number 7777 is the fastest train between HHH and NNN. Hence, [D].

83. Again, we check only the trains given in the answer options. The start time, end time and time taken for these five trains is shown below:

Train Number	Start Time	End Time	Time Taken
8800	4:00 p.m.	7:45 p.m.	3:45
8888	6:15 a.m.	10:15 a.m.	4:00
6666	2:30 p.m.	6:45 a.m.	4:15
4444	1:30 a.m.	6:30 a.m.	5:00
3333	3:00 p.m.	7:30 p.m.	4:30

Thus, train number 8800 is the fastest train between AAA and NNN. Hence, [A].

84. The train that reaches HHH closest to 9:00 a.m. is 8888 and the train that leaves from HHH to NNN closest to 6 p.m. is 8800. However, it does not stop at HHH. The train that stops at HHH and leaves from there at around 6 p.m. is 9900. So, the best combination of trains is 8888 and 9900. Hence, [E].

85. Let us tabulate the data for away matches for each team. Team WB has played total 3 matches out of which 2 matches were at home. So it has played 1 away match. Similarly, it has won 2 matches in all and 2 at home. So, it has not won the only away match that it has played. However, it has one draw overall and no draw in its home matches. So, it's only away match was a draw. Hence, it has 1 point in the away match.

Also, its overall "goals for" count is 6 and its overall goal difference is 5. So, its overall "goals against" count is 1. Since its "goals against" count in the home games is 0, the goal scored against it was in the away game. Since this game was a draw, this team also scored one goal in that match.

Using the logic as above, the table of away matches for each team can be made as shown below.

Note that incomplete data is available for four teams (WG, SU, TOT, and NW). So, their away games data cannot be found. Thus, the table only has data for 11 teams.

Team	Matches	Wins	Draws	GF	GA	GD	Points	Rank
WB	1	0	1	1	1	0	1	8
WH	1	0	0	0	3	-3	0	10
CH	1	1	0	2	0	2	3	3
MC	1	0	1	2	2	0	1	7
SW	1	1	0	5	0	5	3	2
NC	1	0	0	0	2	-2	0	9
FU	2	0	0	2	6	-4	0	11
EV	2	1	0	3	3	0	3	4
MU	2	1	0	3	3	0	3	5
AS	2	1	1	2	0	2	4	1
ST	2	0	2	3	3	0	2	6

Thus, considering the away matches only, SW is the second ranking team. Hence, [D].

86. Consider the table in the previous solution.  
 There are definitely five teams (WB, WH, MC, NC and Fu) that have 0 or 1 point in away matches.  
 We do not know the data for 4 other teams. Therefore, they may or may not have 0 or 1 point.  
 In any case, there are at least 5 teams that have 0 or 1 point in away matches.  
 Hence, [D].

87. The pos values will be as shown below:  
 AS:  $12 - 1 = 11$   
 WB:  $8 - 2 = 6$   
 WH:  $10 - 3 = 7$   
 MC:  $7 - 4 = 3$   
 SW:  $5 - 2 = 3$   
 Thus, the maximum value of pos is for AS  
 Hence, [A].

88. As shown in the table above, there are 6 unique values of goal difference.  
 There is no data on the other 4 teams. Therefore, nothing can be said about their goal difference.  
 Hence, [B].

89. Required ratio =  $\frac{-3.268\% \text{ of } 73555.34}{-1.272\% \text{ of } 35662.2} = \frac{-2403.789}{-453.623} \approx 5.30$ . Hence, [E].

90. For exports and imports only % change is given. Also, the year with which it is calculated is not given. Therefore, actual value of exports and imports cannot be calculated. Thus, only statement 3 can be true.

Let imports and exports in year 2004 be a and b respectively.

∴ Value of imports in year 2010

$$= a \times 1.1799 \times 1.09438 \times 1.163 \times 1.1084 \times 1.08321 \times 1.1649 = 2.10033a$$

$$\therefore \text{The factor by which imports grew from year 2005 to 2010} = \frac{2.10033a}{1.1799a} = 1.78$$

$$\text{Value of exports in year 2010} = b \times 1.1888 \times 1.1383 \times 1.1713 \times 1.1063 \times 1.00813 \times 1.2186 = 2.1542b$$

$$\therefore \text{The factor by which exports grew from year 2005 to 2010} = \frac{2.1542b}{1.1888b} = 1.8121$$

∴ Exports increased at a faster rate than imports. Hence, [C].

91. Number of unemployed persons in 2006 =  $\frac{\text{GDP}}{\text{GDP per capita}} \times \text{Unemployment rate}$

$$= \frac{41159 - 73 \times 10^6}{36553.93} \times \frac{8.9}{100} = 100.214 \text{ million}$$

$$\approx 100 \text{ million}$$

Hence, [A].

**SECTION-D**

92. The Indian companies that feature in the Fortune Five hundred list for 2012 are Reliance Industries, Tata Motors, Tata Steel, IOC. Hence, [A].
93. The Reserve Bank of India decides the monetary policy in India. Hence, [A].
94. The acronyms CPI and WPI refer to price indices. Hence, [C].
95. Davos is a city in Switzerland, which is host to the World Economic Forum, an annual meeting of global political and business elites. Hence, [D].
96. Poverty eradication, improving maternal health, universal primary education, and combating AIDS are all millennium development goals. Hence, [E].
97. Spain, Greece, Iceland and Portugal were most hit by the sovereign debt crisis. Hence, [D].
98. Russia, U.S., Iran, China and Saudi Arabia account for the maximum petroleum production of the world. Hence, [B].
99. High employment rate was not one of the reasons for the recent slide of Indian Rupee. Hence, [E].
100. The IMF and World Bank belong to the Bretton Woods Institute. Hence, [A].
101. The last earth Summit took place in Rio de Janeiro, and another name for earth summit is United Nation Conference on Environment and Development. Hence, [B].
102. France, Ukraine, Sweden and Korea meet more than one fourth of their energy requirement from nuclear power. Hence, [B].
103. The options pair stock exchanges with the country they are in. The correct combination is: Shenzhen – China, NSE – India, SGX – Singapore, DAX – Germany. Hence, [A].
104. Harish Hande is the co-founder of SELCO. Hence, [E].
105. The full form of GAAR is General Anti-Avoidance Rules, which are meant to curtail tax avoidance. Hence, [E].
106. Dr. Manmohan Singh, the Prime Minister, is the chairman of the Indian planning commission. Hence, [C].
107. The correct combination of awards and fields is: Palme d’Or – Movies, Pulitzer – Journalism, Cannes Lions – Advertising, Booker – Literature. Hence, [E].

108. The correct combination of companies and their products is: Amazon – Kindle, Nintendo – Wii, Rovio – Angry Birds, Zynga – Castle Ville. Hence, [B].
109. Not all kinds of excise duty is collected by the Central Government of India, and Excise duty is an indirect tax. Therefore statements II and III are correct. Hence, [B].
110. Of the given options, India exports gems and jewellery the most. Hence, [D].
111. Hydrochloric acid helps in human digestion. Hence, [C].
112. The following is the correct combination of Olympics medal winners from India and their states: Yogeshwar Dutt – Haryana, Mary Kom – Manipur, Vijay Kumar – Himachal Pradesh, Gaurav Narang – Andhra Pradesh. Hence, [C].
113. Tunisia, Egypt, Libya, Algeria, Morocco and Sudan are African countries that have undergone political turmoil in the last two years. Hence, [A].
114. Mr. Rajat Gupta, the former Mckinsey chief, was associated with the Indian Institute of Business, Hyderabad. Hence, [E].
115. China was the highest producer of cars in the world in 2011. Hence, [E].
116. The approximate share of manufacturing sector in India GDP in 2011-12 was 15%. Hence, [D].
117. Amartya Sen, Joseph Stiglitz and Oliver Williamson have won the Nobel Prize in Economics. Hence, [A].
118. Maruti was in the news in July, 2012 due to industrial violence. Hence, [C].
119. One unit carbon permit refers to one metric ton of carbon dioxide. Hence, [C].
120. Nandan Nilekani is the author of *Imagining India*. Hence, [B].
121. V. Kurien was associated with Operation Flood, a dairy development program. Hence, [A].

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