

XAT-2012
EXPLANATORY
ANSWERS

Explanatory Answers

SECTION - A

1. The essential flaw in the writer's reasoning is that he has confused 'nominated for officer status' with 'being an officer'. Rao and Ajit have not yet been confirmed. They have only been nominated. Hence, [D].
2. The letter also brings to light the fact that both Rao and Ajit are already on the Disciplinary Committee. If both their nominations are confirmed, they would be together on two committees. So, [E] is the best option. Hence, [E].
3. No conclusions can be drawn about *Baft* and *Hebe* as they are not even mentioned in the case. Hence, [D].
4. As the question is about dealing with customers, [C], [D] and [E] are irrelevant. Customers are already tired of waiting, so [B] is the only feasible option. Hence, [B].
5. [D] does not encourage any cash flow. [A] is unethical and [E] does not address the issue. Between [B] and [C], [C] is better as it will maximize cash flow while being an ethical alternative. Hence, [C].

Answers to questions 6 to 9:

Departure by AI9810								
Time to reach Ranchi	Airport wait time	Flight time	Time to reach destination in Delhi	Work time	Total time		Departure Time	Time when work gets completed
180	60	105	90	360	795 mins		4:00hrs	17:15hrs
Departure by AI810								
Time to reach Ranchi	Airport wait time	Flight time	Time to reach destination in Delhi	Work time	Total time		Departure Time	Time when work gets completed
180	60	105	90	360	795minutes		11:25hrs	00:40hrs
Departure by IT3348								
Time to reach Ranchi	Airport wait time	Flight time	Time to reach destination in Delhi	Work time	Total time		Departure Time	Time when work gets completed
180	60	105	90	360	795minutes		15:20hrs	4:35hrs
Departure by 12801								
Time to reach railway station	Navigation time	Train duration	Time to reach destination in Delhi	Work time	Total time		Departure Time	Time when work gets completed
5	5	1325	30	360	1720minutes		6:35hrs	11:15hrs next day
Departure by 12443								
Time to reach railway station	Navigation time	Train duration	Time to reach destination in Delhi	Work time	Total time		Departure Time	Time when work gets completed
5	5	1120	30	360	1520minutes		15:45hrs	17:05hrs next day

Arrival by AI9809					
Time to reach airport	Airport wait time	Flight time	Time to reach Jamshedpur from Ranchi	Total time	Departure Time from the destination at Delhi
90	60	105	180	435 mins	3:20 hrs
Arrival by AI809					
Time to reach airport	Airport wait time	Flight time	Time to reach Jamshedpur from Ranchi	Total time	Departure Time from the destination at Delhi
90	60	105	180	435 mins	8:30 hrs
Arrival by IT3347					
Time to reach airport	Airport wait time	Flight time	Time to reach Jamshedpur from Ranchi	Total time	Departure Time from the destination at Delhi
90	60	105	180	435 mins	14:40 hrs
Arrival by 12802					
Time to reach railway station	Navigation time	Train time	Navigation and time to reach home	Total time	Departure Time from the destination at Delhi
30	5	1305	10	1350 mins	21:45hrs
Arrival by 12444					
Time to reach railway station	Navigation time	Train time	Navigation and time to reach home	Total time	Departure Time from the destination at Delhi
30	5	1035	10	1350 mins	16:45hrs

6. Total time in option 1 = 795 + 435 + wait time of 17.15 hrs to 14.40 hrs
 = 795 + 435 + 1285 = 2515 mins.
 Total time in option 2 = 795 + 1350 + wait time of 17.15 hrs to 21.45 hrs.
 = 795 + 1350 + 270 = 2415 minutes
 Total time in option 3 = 795 + 435 + wait time of 4.35 hrs to 3.20 hrs
 = 795 + 435 + 1365 = 2595 minutes

Total time in option 4 = 1520 + 1350 + wait time of 17.05 hrs to 16.45 hrs = 4290 minutes
 Total time in option 5 = 795 + 1350 + wait time of 17.15 hrs to 16.45 hrs = 3555 minutes.
 Hence, [B].

7. Only when travelled by train 12801 the work gets completed between 9.00 hrs and 17.00 hrs. Hence, [B].
8. Time taken in option 1 = wait time of 16.00 hrs to 15.45 hrs + 1520 + 1350 + wait time of 17.05 hrs to 16.45 hrs. = 1425 + 1520 + 1350 + 1420 = 5715 minutes
 Time taken in option 2 = wait time of 16.00 hrs to 15:45 hrs + 1520 + 435 + wait time of 17.05 hrs to 3.20 hrs. = 1425 + 1520 + 435 + 615 = 3995 minutes
 Options 3 and 4 are eliminated as we cannot return by train 12801
 Time taken in option 5 = wait time of 16:00 hrs to 4:00 hrs + 795 + 435 + wait time of 17 : 15 hrs to 3 : 20 hrs = 720 + 795 + 435 + 605 = 2555 minutes
 Hence, [E].
9. Wait time in option 1 = 11.15 hrs to 14:40 hrs = 205 minutes
 Wait time in option 2 = 17.05 hrs to 21.45 hrs = 280 minutes
 Wait time in option 3 = 17.15 hrs to 21:45 hrs = 270 minutes
 Wait time in option 4 = 00:40 hrs to 3:20 hrs = 160 minutes
 Wait time in option 5 = 4:35 hrs to 8:30 hrs = 235 minutes.
 Hence, [D].
10. As the BAG members were critical to the entire project, Mr. Shiv should have included them in the decision making process. [A] would not be the best option as the ERP installation required customization, which would differ from company to company. Also, [A] is more focused on setting a deadline, whereas [E] is more focused on studying feasibility. [B] is not the best option as instead of consulting one outsider, consulting the many BAG members is better as it would help get their support. [C] leaves out the old timers who have the most industry experience. As there is only one external consultant, [D] doesn't make sense. Hence, [E].
11. There is no information to suggest [B] and [D]. [C] is untrue as Mr. Shiv did discuss what needed to be done with the BAG members. It was not the appointment of Mr. Shiv that caused the problem; it was his manner of dealing with the project. He agreed to a substantial revision of the deadline without including the BAG members in the process. Hence, [E].
12. [A] doesn't help Shiv's career nor does it solve the problem at hand. [B] doesn't reflect well on Shiv. He should try to solve the problem himself. Also, [B] talks about firing some BAG members which is an extreme measure and would only lead to a loss of important resources. [E] focuses on ad hoc projects and would lead to a waste of time on the weekends. [C] completely ignores the old members and shows partiality towards the new ones. [D] is the only feasible option that could lead to the achievement of the new deadline. Hence, [D].

13. [A] is talked about in the third paragraph. [C] is talked about in the seventh paragraph. [D] is addressed in the fifth paragraph. The last two paragraphs indicate [E]. Only [B] is not discussed or hinted at. Hence, [B].
14. Since the BAG had helped take the Teknik Group from a Rs. 100 crore group to a Rs. 10,000 crore one, and since Ms. Teknikwali is new to the business, [A] is the best option. Hence, [A].
15. [E] represents the right mix of people required for the successful implementation of ERP in a company. The consultant and new BAG members represent those who are aware of the latest ERP technology and the old timers in BAG represent those who have great knowledge about operations. The need for knowledge about operations is mentioned clearly in the sixth paragraph. [D] is close, but it talks about 'problem solvers', whereas no such problems have been hinted at in the case. Hence, [E].
16. The only option that proposes a solution to the problem is [B]. Hence, [B].
17. Only II and IV are steps aimed at solving the issue at hand. Hence, [B].
18. Sunder and Chethan are not stable, Mani is too young and Chintan has too little driving experience. Also, he may not be stable as he has been forced to take up the job of a driver. Bal Singh is the best option as he is experienced and comes strongly recommended by Ram. His knowledge and contacts are as good as Ram's. Hence, [C].
19. I is in conformity with the case. As discussed above, Bal Singh would be Dev's most preferred candidate. Chethan would be the least preferred as he works with a competitor and therefore may have divided loyalties. II is incorrect as the family's least preferred candidate would be Mani, as he is young and inexperienced. Selecting I and III is not an option; so, III need not be looked at. Hence, [A].
20. The GM (HR) is likely to reject Bal Singh as he needs to ensure that the appointment does not cause discontent among the senior employees. Earlier, Ram Singh had caused such discontent and now Bal Singh, who is likely to exert a similar influence on Dev, is the most likely to do the same. Hence, [C].
21. Refer to the definition of ethics in the first paragraph, and Naresh's conception of society in the third paragraph. The passage makes it clear that Naresh took the job as a government contractor because he could not continue to support his family with his work as a civil contractor. So, from Naresh's perspective, he is being ethical by doing what he has to in order to ensure his dependants' survival, even if that involves inflating his prices and paying bribes. Hence, [E].
22. Based on the same reasoning as in the previous question, Naresh's actions are ethical, as he is trying to keep his business afloat, and thereby help his society – i.e. his family

and employees. Srikumar believes in the brotherhood of contractors sticking together in face of external threat, so his helping Naresh is in keeping with his own ethics. Therefore, both Naresh and Srikumar are behaving ethically. Hence, [C].

23. Based on the definition of morality given in the first paragraph, we can infer that Srikumar is being immoral in pressurizing Naresh not to help out the police with their investigation. However, he is being true to his own ethics, as he is helping his fellow contractor Naresh to keep from disrupting his own business, and indirectly also helping Lankawala from getting in trouble with the police. So he is acting immorally but not unethically. Naresh is not unethical, as he has not done anything to endanger his society. There is no information given about the other contractors' ethical principles, so nothing about them can be inferred. Hence, [A].
24. The most logical reason for Manohar to oppose the proposal is [E]. [C] is a reason for demanding clarity on the proposal, not for opposing it right away. [A], [B] and [D] are too extreme. Hence, [E].
25. [A] and [B] are too cynical. Saral Co. also operates in seven north-eastern states only, so [C] cannot be the reason. Between [D] and [E], the latter is a better answer, as it shows that the management is taking the GM's proposal seriously, but not implementing it unthinkingly. Hence, [E].

SECTION - B

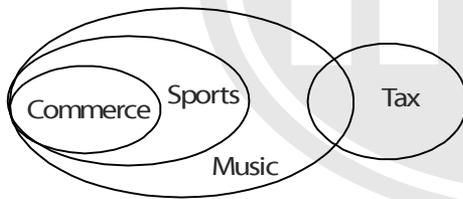
26. The idiom 'on a wing and a prayer' means 'with only the slightest hopes of succeeding'. Thus, it can be inferred that the Indian team was 'under prepared'. 'Well prepared' and 'over confident' are opposite in meaning to the idiom. 'High in spirits' and 'buoyant' meaning 'cheerful' are not the same as the given idiom. Hence, [D].
27. Either 'might' or 'may' could fit into the first blank. The second part of the sentence talks about the past. The past perfect tense is used to describe an action completed at a certain moment in the past. So, 'had dared' correctly fits the second blank. Hence, [B].
28. The fact that AC Milan's success in Europe in the sixties introduced the *libero* implies [A]; the fact that AC Milan's success in Europe a quarter of a century later (i.e. in the late eighties) killed off the *libero* implies [B]. [C] is implicit in the time period stated (a quarter of a century) between the introduction and death of the *libero*. Since the *libero* was 'killed off' in Italy in the late eighties, we can infer [E]. Only [D] is not implied – in fact, it contradicts the suggestion in the statement that AC Milan continued to be successful from the sixties to the late eighties. Hence, [D].
29. All the options are antonyms of each other except [D]. 'Study' and 'analyse' are not antonyms. Hence, [D].
30. According to the argument, the literacy rate fell between 1991 and 2001, and then rose between 2001 and 2006, so there was a net rise. However, if the rate of fall between 1991

and 2001 was greater than the rise between 2001 and 2006, then there would be a net fall not rise. So [D] effectively refutes the argument. The rest of the options are tangential to the issue. Hence, [D].

31. 'Embezzlement' means 'misappropriating money or property entrusted to one's care'. Hence, [B].
32. Statement E introduces the 'factors' that are the topic of the paragraph. A mentions one way of classifying these factors. C mentions 'another way' of doing so. D and B – in that order – expand on the point mentioned in C. Therefore, the correct sequence is E-A-C-D-B. Hence, [A].
33. According to the second paragraph, a person's well-being aspect and agency aspect are interconnected, though not completely dependent on each other either. So [B], [C] and [E] are incorrect. [D] is also not necessarily true, according to the first paragraph. Only A is true, as can be inferred from the last sentence of the second paragraph. Hence, [A].
34. As suggested in the second paragraph, a person's sense of well-being may be enhanced when he or she achieves what he or she wants to achieve, which may be something for the sake of others. But that does not mean that the person's well-being is solely dependent on his achievements. This is the same idea put forth in option [D]. Hence, [D].
35. All the options highlight the agency aspect of the people concerned. But in [A], [C] and [D], the people's well-being suffers in the course of their actions, while well-being is not mentioned in [B] at all. Only in [E] does the person's well-being also increase – i.e. the politician gains the voters' respect. Hence, [E].
36. Statement I can be inferred from the first sentence of paragraph 2. Statement III is stated in paragraph 1. But statement II is incorrect – in fact, the author argues against such an either-or duality. Hence, [D].
37. In options [A] to [D], all the people in the example are exercising their agency to bring about a change in their own or others' well-being. However, in [E], the ascetic is not exercising agency – praying may enhance his own well-being, but will not actually bring about world peace. Hence, [E].
38. In option [E], 'of flying' is incorrectly used after 'ability'. The correct phrase should be 'to fly'. All the other options are grammatically correct. Hence, [E].
39. Options [A], [C] and [E] can all be inferred from Lionel, Diego and Alfredo's statements respectively. Since all three say three different things, it is possible they may disagree with each other on certain things, so [B] is also inferable. Only [D] cannot be inferred: though Alfredo states that 'Argentina was a football powerhouse' and Diego states that it still *is*, this does not mean that they disagree completely – it could be that they both think that Argentina was and still is a football powerhouse. Hence, [D].

40. Option [E] is wrong as 'that' is usually used for things not people. 'From they' and 'from he' in [A] and [C] are grammatically incorrect, as is 'them who' in [B]. Only the form 'from those who' in [D] is grammatically correct. Hence, [D].
41. According to the last sentence of the paragraph, 'all behaviour is a predictable interaction of experience and genotype'. So the option that strengthens this argument would be the one that says that organisms with identical genotypes and identical experiences behave identically. Hence, [D].
42. The passage states that though psychotherapy patients develop a friendship with their therapists, which they cite as the main reason for their improvement, the friendship does not continue after the formal paid visits end. This implies that though the therapists may be genuinely concerned with their patients' welfare, they are also just as concerned with making money, and do not provide therapy for free. Hence, [A].
43. The passage mentions that most Asian countries have a trade deficit with China, and cites several examples, including that of Bangladesh, Indonesia as well as South Korea. [A] is consistent with the passage; [E] would be just yet another example of the same; [B] makes no difference to the argument; and [D] is irrelevant, as China is not mentioned at all. Only [C] is inconsistent with the passage, as the passage states that Indonesia's trade deficit with China continues to increase, while the option states that exports to Indonesia from China decreased. Hence, [C].

44.



- Refer to the diagram above. [A], [B] and [C] are not necessarily true. [E] is definitely false, as it contradicts the first and third statements. Only [D] can be inferred, from the first two statements. Hence, [D].
45. 'Head' and 'chief' are synonyms of each other, so one of them is redundant. But, 'head chef' means the chief cook in a restaurant, an idea borne out by the rest of the sentence. Thus, [A] and [C] are eliminated. 'Housefly' is one word, not two or a hyphenated phrase. Hence, [B].
46. 'Posit', 'propose', 'conjecture' and 'speculate' are all synonyms of 'hypothesize'. Only 'refute', meaning 'disprove', is its opposite. Hence, [D].
47. Statement E, which introduces the topic (the concept of warehousing), is the first sentence. 'This' in C refers to the fact that the concept is not new in India (mentioned in E) and B elaborates on this point, so C and B follow E. D brings in a contrast with the use of the word 'however', and A continues the same point. Thus we get the sequence E-C-B-D-A. Hence, [B].

48. 'Concurrence' means 'agreement'. All the given options are synonyms of the given word. Though 'coincidence' has a primary meaning of 'two chance events occurring simultaneously', it also has a secondary meaning that is synonymous to 'concurrence'. Therefore, there is no correct answer.
49. The examples in statement (i) link it to statement (ii), so we get the (ii)-(i) link. 'They' in (iv) refers to 'business cycles' in (ii), so we get the (iii)-(iv) link. This rules out options [B] and [C]. The reference to government policy not stimulating the economy in (v) indicates that this sentence serves as the bridge between the two sets of statements, (ii)-(i) and (iii)-(iv), as in [E], and not as a concluding statement, as in [A] and [D]. Hence, [E].
50. The argument can be summed up by the expression 'Less is more'. That is, a decrease in something causes an increase in its overall effectiveness. In the argument, the decrease in the rate of income taxes results in increased total income tax revenues. Similarly in [C], a decrease in the number of words in an advertisement results in an increase in its effectiveness. Hence, [C].
51. The first part of the sentence 'unwarranted optimistic picture' gives us the clue for the word to be filled in the blank. Since the CEO wanted to present a realistic picture in the board meeting, 'conservatively' fits the blank correctly. 'Liberally' or 'fancifully' are the opposite of the picture that the CEO wants to convey. 'Pessimistically' would mean the opposite of what is mentioned in the first part and 'strictly' is contextually incorrect. Hence, [E].
52. Though the author does do [B], [C] and [E] to some extent, these are not his objectives in writing the passage. [D] is too extreme, and cannot be inferred from the passage. Refer to the second and fourth paragraphs: the author highlights that Indian EPZs (similar to Chinese SEZs) have failed, due to mismanagement by the government. Hence, [A].
53. Refer to the last paragraph: '... an SEZ must be of an adequate size to provide opportunities for reaping the benefit of large-scale operations and their number should be few'. Thus [B] and [D] can be inferred. [C] can be inferred from the last sentence of paragraph 3. [E] is stated in the last sentence of the passage. So all of these can be concluded. Only [A] cannot be concluded: the author's entire argument is that SEZs may not be the best option for India – refer especially to the first sentence of paragraph 2. Hence, [A].
54. The author opposes [A], as can be inferred from his tone in the last paragraph. Similarly, his tone in the last sentence of paragraph 2 suggests he opposes [B] as well. His opposition to [D] and [E] can be inferred from paragraph 3. But he does not oppose [C], as seen in his positive attitude towards the example of China in the last two sentences of paragraph 1. Hence, [C].
55. Refer to paragraph 3: 'Even after three years of the enactment of the Electricity Act (2003) ...'. So we can calculate that the passage was written in 2006. Hence, [D].
56. Refer to this sentence: 'if we could understand evolution, we could understand the most precious of processes: innovation'. So I can be inferred. The author's main aim in the passage is trying to understand technological evolution, so II is also inferable. In the first half of

the passage, the author differentiates between technology that evolves and that which is born independently; based on this and the first sentence of the passage, III can be inferred. IV can be inferred from the last two sentences of the passage. Therefore all the statements can be inferred. Hence, [E].

57. It can be inferred that the unanswered question that the author wants to explore is 'Does technology evolve?' I implies that the question is solved, since it describes the evolution of one form of technology (ships). II too implies that technology evolves, so it definitely answers the question. On the other hand, III leaves the question unanswered. IV and V give examples of technology that could have evolved from earlier technology, but do not definitively claim that it did. Therefore III, IV and V strengthen the author's premise that the question that he has identified has not been solved as yet. Hence, [E].

SECTION - C

58. VP(HR) visits on every 3rd day.
 VP(Operations) visits on every 4th day.
 VP(sales) visits on every 6th day.
 \therefore All three of them visit simultaneously on every 12th day.
 They met the CEO on 3rd Jan 2012.
 \therefore They will next meet him on 15th Jan, 27th Jan, 8th Feb 2012.
 Since CEO is on leave from 5th to 28th Jan 2012, so they will next meet on 8th Feb 2012.
 Hence, [C].
59. Mean of salaries = 5 lakhs
 \therefore Total salary = $5 \times 5 = 25$ lakhs
 8 is the only mode
 \therefore 8 lakhs is the median
 $\therefore 5 + 8 + 8 = 21$ lakhs is the salary of the highest earning vice presidents.
 \therefore The lowest earning vicepresidents earn a total of 4 lakhs.
 \therefore Lowest salary = 1 lakh
 Highest salary = 8 lakhs
 Required sum = $8 + 1 = 9$ lakhs
 Hence, [A].
60. We do not know which year is 2010 in the graph given. Hence, [E].
61. Revenue of yahoo in the 6th year = 1200
 Revenue of yahoo in the 4th year = 250

$$\text{Average percentage revenue increase for yahoo} = \frac{1}{2} \times \frac{(1200 - 250)}{250} \times 100 = 190\%$$
 Revenue of Facebook in the 6th year = 2000
 Revenue of Facebook in the 4th year = 350

$$\text{Average percentage revenue increase for Facebook} = \frac{1}{2} \times \frac{(2000 - 350)}{350} \times 100 = 235.7\%$$

Required difference = $235.7 - 190 \approx 46$. Hence, [C].

62. Percentage increase in Google's revenues between 5th and 6th years

$$= \frac{(3250 - 1500)}{1500} \times 100 = 116.67\%$$

$$\therefore \text{New revenue of facebook} = \frac{216.67 \times 750}{100} \approx 1625$$

Hence, [A].

63. They spill equal amounts of water.

\therefore The person with the least quantity of water will spill the highest percentage of water. Bina is the youngest of them all and carries the least amount of water. Hence, [E].

64. For shapes with equal volume a sphere has the least surfact area,

\therefore Maximum juice can be extracted from the watermelon with least surface area. Hence, [E].

65. Amount due at the beginning of 2nd year = $1.05 \times 6000 - 1200 = 5100$

Amount due at the beginning of 3rd year = $1.05 \times 5100 - 1200 = 4155$

Hence, [C].

66. Let 'r' be radius of smaller sphere

Volume of bigger sphere = $1000 \times$ volume of smaller sphere

$$\therefore \frac{4}{3}\pi \times 10^3 = \frac{4}{3}\pi r^3 \times 1000$$

$$\therefore r = 1 \text{ cm}$$

Total surface area of larger sphere = $4\pi \times 10^2 = 400\pi$

Total surface area of all the smaller spheres = $4\pi \times 1^2 \times 1000 = 4000\pi$

$$\therefore \text{Total surface area increases by} \Rightarrow \frac{3600\pi}{400\pi} \Rightarrow 9 \text{ times}$$

Hence, [E].

67. Let the volume of the jug be 'x' litres.

	Orange	Pineapple
Initial Quantity	10	0
After 1 st replacement	10 - x	x
After 2 nd replacement	$(10 - x) - \frac{x(10 - x)}{10} = 5$	$x - \frac{x^2}{10} + x = 5$

Given,

$$2x - \frac{x^2}{10} = 5$$

$$\therefore 20x - x^2 = 50$$

$$\therefore x^2 - 20x + 50 = 0$$

$$\therefore x = \frac{20 \pm \sqrt{400 - 200}}{2} = \frac{20 \pm \sqrt{200}}{2}$$

$$\therefore x = 10 \pm 5\sqrt{2}$$

But x has a value less than 10

$$\therefore x = 10 - 5\sqrt{2} \approx 2.9$$

Hence, [D].

68. Let Nikhil buy x, y, z pieces of Kajubarfi, gulabjamun and sandhesh respectively.

$$\therefore x + y + z = 100 \quad \dots (1)$$

$$10x + 3y + 0.5z = 100 \quad \dots (2)$$

$$\therefore 20x + 6y + z = 200 \quad \dots (3)$$

From (1) and (3)

$$19x + 5y = 100$$

This equation is satisfied for integral values of x, y only when x = 5 and y = 1.

\therefore Nikhil buys only one gulabjamun. Hence, [A].

69. Let 'x' be the number of pots.

Amount received from pots = Rs.x²

Let number of potato chips packets = a

Number of banana chips packets = l

Let cost of banana chips packets = m

$$\therefore \text{Cost of chips packets} = 10a + m$$

$$\therefore x^2 = 10a + m$$

Also, 'a' is an odd number as both sons equally distribute (a + a) chips packets.

\therefore (10a + m) will have odd numbered ten's digit.

Also, 'm' is even as both sons will get equal share of the money.

Squares with an odd ten's digit always end in 6.

$$\therefore m = 6$$

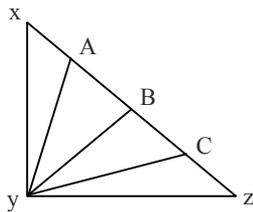
One brother buys $\left(\frac{a}{2}+1\right)$ potato chips packets.

The other brother buys $\left(\frac{a}{2}\right)$ potato chips packets and 1 banana chips packet.

∴ The first brother spends $(10 - 6) = 4$ more than the other brother.

∴ The second brother must give the other brother Rs.2 to make the division financially equitable. Hence, [B].

70.



Consider the above figure,

$$xz = 80$$

$$xA = AB = BC = Cz = 20$$

$$xB = Bz = 40$$

∴ B is the circumcenter of Δxyz

$$\therefore yB = 40$$

Using appolonius theorem in ΔxyB and ΔByz

$$xy^2 + By^2 = 2(Ay^2 + 20^2) \quad \dots (1)$$

$$yz^2 + By^2 = 2(Cy^2 + 20^2) \quad \dots (2)$$

Adding (1) and (2),

$$\therefore (xy^2 + yz^2) + 2By^2 = 2(Ay^2 + Cy^2 + 2 \times 20^2)$$

$$\therefore xz^2 + 2By^2 = 2Ay^2 + 2Cy^2 + 4 \times 20^2$$

$$\therefore 80^2 - 4 \times 20^2 = 2Ay^2 + 2Cy^2 - 2By^2$$

$$\therefore 6400 - 1600 + 2By^2 = 2Ay^2 + 2Cy^2$$

$$\therefore 8000 = 2Ay^2 + 2Cy^2$$

$$\therefore Ay^2 + Cy^2 = 4000$$

$$\therefore Ay^2 + Cy^2 + By^2 = 5600$$

Hence, [C].

71. Total distance travelled = $800 - 400 = 400$ km

Total petrol used = initial quantity + purchased quantity - remaining quantity

$$= 10 + (20 + 15 + 10 - 5) = 50 \text{ litres}$$

$$\text{Mileage} = \frac{400}{50} = 8 \text{ km/litre}$$

Hence, [A].

72. Mileage is unchanged at 8 km/litre.

Cost of petrol is lower at places ahead of Rampur

∴ Ramya will fill enough petrol to reach the first petrol pump after Rampur.

$$\text{Distance} = 800 - 650 = 150 \text{ km}$$

$$\text{Petrol required} = \frac{150}{8} = 18.75 \text{ litres}$$

∴ Ramya fills $(18.75 - 5) = 13.75$ litres from Rampur.

$$\text{Cost} = 13.75 \times 45 = \text{Rs.}618.75$$

At the next petrol pump she fills tank capacity required to reach next petrol pump

$$\text{Distance} = 650 - 600 = 50 \text{ km}$$

$$\text{Petrol required} = \frac{50}{8} = 6.25 \text{ litres}$$

$$\text{Cost} = 6.25 \times 40 = \text{Rs.}250$$

She will have to buy the remaining petrol at Rs.35 litre.

$$\text{Petrol required} = \frac{(600-400)}{8} = \frac{200}{8} = 25 \text{ litres}$$

$$\text{Cost} = 25 \times 35 = \text{Rs.}875$$

∴ Total cost = $618.75 + 250 + 875 \approx 1744$. Hence, [D].

73. 10 ml of potency 1 = $\frac{1}{5}$ th of a tablet (∵ 50 ml = 1 tablet and 50 ml = 1 dose)

15 ml of potency 2 = $\frac{3}{5}$ th of a tablet (∵ 50 ml = 2 tablets but 25 ml = 1 dose)

30 ml of potency 4 = $\frac{12}{5}$ th of a tablet (∵ 50 ml = 4 tablets but $\frac{50}{4}$ ml = 1 dose)

$$\therefore \text{Total potency} = \frac{1}{5} + \frac{3}{5} + \frac{12}{5} = \frac{16}{5} = 3.2 \text{ tablets}$$

Hence, [B].

74. Let 'x' litres of 12% solution be replaced with 39% solution.

$$\therefore \frac{39}{100}x + (27 - x)\frac{12}{100} = \frac{21}{100} \times 27$$

$$\therefore \frac{27x}{100} + \frac{12 \times 27}{100} = \frac{21 \times 27}{100}$$

$$\therefore x = 9 \text{ litres.}$$

Hence, [B].

75. Let the distance between terminal A & terminal B be 'x' km.

Bus 1 covers 7 km and Bus 2 covers $(x - 7)$ km at first meet.

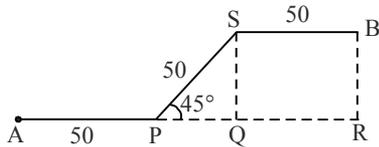
Bus 1 and Bus 2 cover a cumulative distance of x before first meet and a cumulative distance of $2x$ between first meet and second meet.

∴ Bus 1 covers an equivalent distance of $2 \times 7 = 14$ km between 1st and 2nd meet

∴ Distance covered by bus 1 before 2nd meet = $7 + 14 = 21$ km

But distance covered by bus 1 = $x + 4$ (\because it is 4km from terminal B)
 $\therefore x = 17$ km
 \therefore Total distance covered by the buses = $34 \times 5 \times 2 = 340$ km
 \therefore Cost = $340 \times 20 = 6800$
Hence, [D].

76. Consider the following route.



$$QR = 50 \text{ m}$$

$$PQ = QS = \frac{50}{\sqrt{2}} \text{ (45° angle)}$$

$$\therefore AR = 50 + \frac{50}{\sqrt{2}} + 50 = 100 + \frac{50}{\sqrt{2}}$$

$$BR = \frac{50}{\sqrt{2}} \text{ m}$$

$$\therefore AB^2 = AR^2 + BR^2 = 10000 + \frac{2500}{2} + 5000\sqrt{2} + \frac{2500}{2} = 12500 + 5000\sqrt{2}$$

$$\therefore AB = \sqrt{2500[5+2\sqrt{2}]} = 50\sqrt{5+2\sqrt{2}}$$

Comparing $a\sqrt{b+\sqrt{c}}$ with $50\sqrt{5+\sqrt{8}}$

$$\therefore a = 50; b = 5; c = 8$$

$$\therefore a + b + c = 63$$

Hence, [E].

77. Let a roti cost 'r' and a tadka plate cost 't' and a cup of tea cost 'x'.

$$\therefore 10r + 4t + x = 80 \quad \dots (1)$$

$$7r + 3t + x = 60 \quad \dots (2)$$

$$\therefore 3r + t = 20$$

$$\therefore 9r + 3t = 60 \quad \dots (3)$$

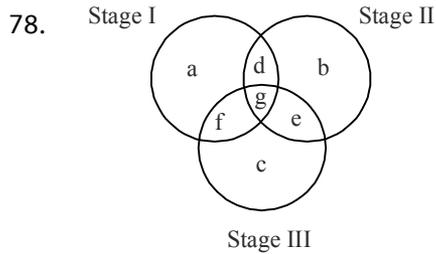
(1) - (3) will give us,

$$\therefore r + t + x = 20$$

$$\therefore 5(r + t + x) = 100$$

Hence, Anthony will pay Rs.100

Hence, [D].



Let a, b, c, d, e, f, g be the times the softward failed at different stages.

$$d + g = 6$$

$$e + g = 7$$

$$f + g = 4$$

$$g = 4$$

$$\therefore f = 0; e = 3; d = 2$$

$$a + d + f + g = 15$$

$$\therefore a = 9$$

$$b + d + e + g = 12$$

$$\therefore b = 3$$

$$c + f + e + g = 8$$

$$\therefore c = 1$$

Software failing only in single stage = $a + b + c = 9 + 3 + 1 = 13$. Hence, [B].

79. Volume of cone = $\frac{1}{3}\pi r^2h = \frac{1}{3} \times \frac{22}{7} \times 7 \times 0.25 \times 0.25 = \frac{11}{24} \text{ cm}^3$

$$\therefore 1 \text{ cm}^3 \text{ can write}$$

$$\therefore 1 \text{ cm}^3 = 1 \text{ ml}$$

$$\therefore 1 \text{ ml of cream can write 720 words.}$$

$$\therefore \frac{3}{5} \text{ litre of cream can write } \Rightarrow 600 \times 720 = 432000 \text{ words. Hence, [E].}$$

80. Number of 4's = $\frac{43.14}{100} \times 306 \times \frac{1}{4} = 33$

Number of 6's = $\frac{3.92}{100} \times 306 \times \frac{1}{6} = 2$. Hence, [E].

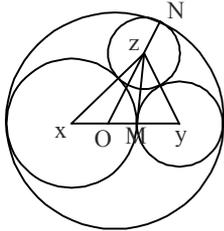
81. Initial score = 306

New score = $306 + 20 - 4 = 322$

Runs scored in 4's = $\frac{43.14}{100} \times 306 + 20 = 152$

$$\therefore \text{Central angle} = \frac{152}{322} \times 360 \approx 170^\circ. \text{ Hence, [E].}$$

82.



Let the circle with center O have radius = 15 feet
 Circles with centers x, y have radius 10 feet, 5 feet respectively.

Let radius of circle with center z be 'r'.

$$\therefore xM = 10$$

$$yM = 5$$

$$xO = 5$$

$$OM = 5$$

$$xz = 10 + r$$

$$yz = 5 + r$$

$$Oz = 15 - r$$

Oz is the median in ΔxzM

Using appollonius theorem we have,

$$xz^2 + Mz^2 = 2(Oz^2 + OM^2)$$

$$\therefore (10 + r)^2 + Mz^2 = 2((15 - r)^2 + 5^2)$$

$$\therefore Mz^2 = 2[r^2 + 225 - 30r + 25] - 100 - r^2 - 20r$$

$$\therefore Mz^2 = r^2 - 80r + 400$$

zM is the median in ΔOzy

Using appollonius theorem we have,

$$Oz^2 + zy^2 = 2[Mz^2 + OM^2]$$

$$(15 - r)^2 + (5 + r)^2 = 2Mz^2 + 2 \times 25$$

$$\therefore 2Mz^2 = 225 + r^2 - 30r + 25 + r^2 + 10r - 50$$

$$\therefore Mz^2 = r^2 - 10r + 100$$

$$\therefore r^2 - 80r + 400 = r^2 - 10r + 100$$

$$\therefore 70r = 300$$

$$\therefore r = \frac{30}{7} \approx 4.28 \text{ feet}$$

$$\therefore \text{Diameter} \approx 8.59 \text{ feet. Hence, [C].}$$

83. From the given options only using statements (i), (ii), (v) and (vi) we can determined the individual ages of Jose's sons. Hence, [E].

84. Ratio of investment of Ram and Shyam = 2 : 3

$$\therefore \text{In a profit of 200,000 share of Shyam} = \frac{3}{5} \times 200000 = 120000$$

$$\text{In a profit of 400000 share of Shyam} = 120000 + \frac{20}{100} \times 200000 + \frac{3}{5} \times \frac{80}{100} \times 200000$$

$$= 120000 + 40000 + 96000 = 256000$$

Let the profit be $(400000 + x)$

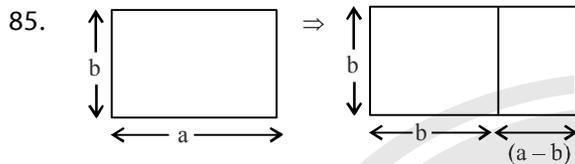
$$\therefore \text{Shyam's share in profit} = 256000 + \frac{35}{100} \times x + \frac{3}{5} \times \frac{65}{100} \times x$$

$$\therefore 367000 = 256000 + \frac{74x}{100}$$

$$\therefore 111000 = \frac{74x}{100}$$

$$\therefore x = 150000$$

\therefore Total profit = $400000 + 150000 = 550000$. Hence, [D].



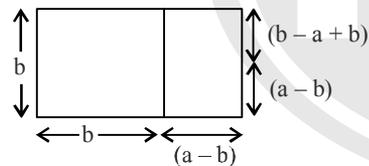
Consider the above plot of land

Initially a square plot of side 'b' is sold at 1200 sq.ft.

Cost of the plot = $1000 \times ab$

Selling price of first smaller plot = $1200 b^2$

Next a square of length $(a - b)$ was sold at 1150 sq.ft.



Selling price of second smaller plot = $1150(1 - b)^2$

Perimeter of remaining plot = $2[a - b + b - a + b] = 2b$

Perimeter of actual plot = $2(a + b)$

$$\therefore \frac{b}{a+b} = \frac{3}{8}$$

$$\therefore \frac{b}{a} = \frac{3}{5}$$

We can assume $a = 5$ and $b = 3$ without loss generality.

Assuming $a = 5$ and $b = 3$ we have,

Cost price = 15000

Required selling price = $1.1 \times 15000 = 16500$

Selling price of first and second plot = $10800 + 4600 = 15400$

\therefore Remaining plot must be sold for = $16500 - 15400 = 1100$

Area of remaining plot = $2 \times 1 = 2$ sq.ft.

\therefore Remaining plot must be sold at 550 sq.ft. Hence, [B].