

# XAT-2018

## EXPLANATORY ANSWERS

### PART-A

### SECTION-I

### VERBAL and LOGICAL ABILITY

Q.1) According to the passage, history does not provide any actionable principle, except that it helps citizens to be liberated from the past. For historians, studying history aims to loosen the grip of the past. It enables us to turn our head this way and that; we begin to notice possibilities that our ancestors could not have imagined,... By observing the accidental chain of events that led us here, we realize how our very thoughts and dreams took shape. This, in turn, encourages us to think and dream differently. Among the four options, option B is the most neutral representation of history making us aware of its self, rather than acting concretely upon our consciousness like in other options. Hence, [b] is the correct answer.

Q.2) The passage begins with how History differs from the pure sciences in that pure sciences (like Physics) help predict the future, while History does not. Learning history helps us to be free of the past – in that we do not repeat the mistakes of the past. History gives us the perspectives that shaped the lives of past generations. “Studying history... enables us to turn our head this way and that, and begin to notice possibilities that our ancestors could not imagine, ... By observing the accidental chain of events that led us here, we realize how our very thoughts and dreams took shape – and we can begin to think and dream differently. Studying history will not tell us what to choose, but at least it gives us more options”

This widening of perspective is best expressed in option E. The word eclectic means “selecting what appears to be best in various doctrines, methods, or styles.” All other options are factually correct but limited in scope. They do not capture the essence of the passage. Hence, [E] is the correct answer.

Q.3) This question is based on the predictive power that science holds, but history does not. The writer states this difference between Physics and History at the beginning of the passage. An option that asserts that History too can have predictive power will contradict the argument put forward by the writer. Options 1 and 4 do this. Option 2 merely describes how science works– it neither contradicts nor supports the author’s point of view. Option 3 supports the writer’s point of view. Hence, [D] is the correct answer.

Q.4) The writer explains the interaction between doubt and belief in the second paragraph. He concludes that, "Doubt serves as an irritant that causes us to appease it by answering a question and thereby fixing a belief and putting the mind to rest on that issue." Option E briefly states the same idea in different words. Options A and B are incorrect in the use of the word "always." Option C contradicts the passage. Though the passage states that the mind may contain doubts and beliefs at the same time, it is in relation to different ideas. The option implies that both co-exist in relation to the same thought or idea, which is not possible. Option D is incorrect as the writer does mention the interaction between them. Hence, [E] is the correct answer.

Q.5) The second paragraph states that, "Once we achieve a belief, we can take the necessary action to reach our destination". The action here refers to the candidate applying for the XAT exam. Thus, it can be understood that the candidate has a belief in the XAT application process. Thus, [A] is the correct answer. [B], [C], [D] and [E] do not address the point raised by Peirce, of action following from belief. Hence, [A] is the correct answer.

Q.6) Dilettantism is used to denote a sense of inexperience, unpreparedness, clumsiness, crudeness, ham-handedness or heavy-handedness.

In the last paragraph, it is stated that 'Peirce acknowledges that some people like to think about things or argue about them without caring to find a true belief, but he asserts that such dilettantism does not constitute thought'. Since it is said that thinking or arguing about things without caring to find the true belief does not constitute thought, it is clear that 'such dilettantism' refers to a guess being made without a strong base. Hence, [C] is the answer.

Q.7) In the second paragraph, the author states that, "Once we achieve a belief, we can take the necessary action to reach our destination. Objectively, a belief is a rule of action. The whole purpose of thought consists in overcoming a doubt and attaining a belief."

Thus, if a person should keep awake for twenty hours in a day to score well in an examination, but is awake for only fifteen hours, it is clear that necessary action to reach the destination has not been taken. We can thus conclude that the person does not have true belief in what he thinks. Hence, [B] is the correct answer.

Q.8) The third paragraph of the passage states that, "Materialists hope that we will one day be able to explain consciousness in purely physical terms. The problem with materialist approaches to the hard problem is that they always end up avoiding the issue by redefining what we mean by 'consciousness'."

The passage further states that, “They start off by declaring that they are going to solve the hard problem, to explain experience; but somewhere along the way they start using the word ‘consciousness’ to refer not to experience but to some complex behavioural functioning associated... But the hard problem of consciousness cannot be solved by changing the subject.”

Thus it is clear that the hard problem cannot be solved by the materialists. Hence, [B] is the correct answer.

Q.9) The writer discusses the nature of the “hard problem of consciousness” in paragraphs 2 and 3. The hard problem of consciousness can be briefly explained as the following: when the brain is stimulated, we feel certain sensations; however, it is not possible to explain why we feel those sensations – in other words, how we feel those sensations is understood but not why. This is further explained in paragraph 4: “philosophers have declared that certain phenomena are too special to be explained by physical science – light, chemistry, life – only to be subsequently proven wrong by the relentless march of scientific progress.” So the question that cannot be answered is “why do humans take birth?” The rest of them are explainable. Hence [E] is the correct answer.

Q.10) The passage tries to create a discussion on science and consciousness. In the last paragraph, we see the writer stating that, “If Galileo were to time travel to the present day and be told that scientific materialists are having a problem explaining consciousness in purely physical terms, he would no doubt reply, “Of course they do, I created physical science by taking consciousness out of the physical world!”

Thus, the passage argues that science and consciousness are two different domains. Hence, [D] is the correct answer.

Q.11) The last few sentences in the passage state that “Though the working class is the living part of capital, its occupational structure, modes of work, and distribution through the industries of society are determined by the ongoing processes of the accumulation of capital. It is seized, released and flung into various parts of the social machinery and expelled by others, not in accord with its own will or self-activity, but in accord with the movement of capital”. Thus it is clear that the will of capital overpowers the will of labor. Hence, [B] is the correct answer.

Q.12) The passage states that, “That portion of money capital which is set aside for the payment of labor, the portion which in each cycle is converted into living labor power, is the portion of capital which stands for and corresponds to the working population, and upon which the latter subsists”. Thus, it is clear that the working class subsists on labor purchased by the capitalist. Hence, [E] is the correct answer.

Q.13) Study the following sentences from the passage: “Before it is anything else, therefore, the working class is the animate part of capital, the part which will set in motion the process that yields to the total capital its increment of surplus value. As such, the working class is first of all, raw material for exploitation.... But since, in its permanent existence, it is the living part of capital, its occupational structure, modes of work, and distribution through the industries of society are determined by the ongoing processes of the accumulation of capital. It is seized, released, flung into various parts of the social machinery and expelled by others, not in accord with its own will or self-activity, but in accord with the movement of capital.”

From this, we can infer that the pursuit of capital accumulation results in exploitation of the working class. Hence, [D] is the correct answer.

Q.14) It can be seen that [3] begins the passage by introducing the topic – hyperspace theory. It is then followed by [1], which states that its most advanced formulation is called the superstring theory. [4] comes next as it states the specific details of the dimensions of the superstring theory. Thus, we get the 314 set. Now, [5] states that ‘the theory of hyperspace has not yet been experimentally confirmed’ and [2] follows up by mentioning the other side of the argument that ‘...the theory has already swept across the major physics research laboratories’. Thus, 52 is a pair. This pair can only be placed after the 314 set. Thus we get the sequence 31452. Hence, [A] is the correct answer.

Q.15) [3] introduces the topic – the victims. [5] comes next as it states that the victims are no more and will not be there to defend themselves from the use that others make from their deaths. Thus, we get the 35 pair.

Now we have to identify the other pair. [2] states that it will be easy to sanctify identities by the deaths and [1] follows, stating that it is more important to do something else – understanding the actions of the perpetrators. Thus, we get the 21 pair. Finally, [4] comes after 21 by stating the moral dangers involved in such a situation. Also, the 214 sequence can only come after 35. Hence, we get the final sequence 35214. Hence, [C] is the correct answer.

Q.16) Arti wants to work as manager of a nonprofit organization. College X is dedicated to producing compassionate and curious leaders, a quality which is important for those who wish to help people. College Y has a leading research facility, which may not be particularly useful for Arti as she does not want to get into the research field. Thus, it is clear that students will apply to colleges with mission statements that align with their goals. Hence, [D] is the correct answer.

Q.17) The first three options are eliminated as payoff is usually derived from “investment” and not “expenditure” or “productivity”. If the payoff is “slow and predictable”, it cannot be an irrelevant

predictor of economic change. Thus, [E] is eliminated. Also, if data is “erratic”, meaning “inconsistent” or “uncertain”, it is useless in predicting anything. Thus, [D] is the correct answer.

Q.18) According to the rules of usage, “fewer” is used when discussing countable things, while “less” is used for singular mass nouns. For example, you can have fewer ingredients, dollars, people, or puppies, but less salt, money, honesty, or gold. Had the first blank been followed by “grams of gold”, “fewer” would have been an appropriate choice. Thus, [A] and [C] are to be retained. In the third blank, we have to choose between “sometime” and “some time”. “Sometime” means “at some point” or “former”. “Some time” means “a period of time”. From the sentence, it is clear that George R. Martin has not worked on the book for “some time”. Thus, [A] is the only option remaining with us. Similarly, in the fourth blank, “sometime” is the most appropriate. Hence, [A] is the correct answer.

Q.19) “Difference” is a point or way in which people or things are not the same. “Unique” is being the only one of its kind. As “unique” means unlike anything else, it cannot be used for comparison. Thus, [A] and [E] are eliminated. From the context, it is clear that though Vikram’s approach was different from that of Harpreet, he was expecting no criticism from her. Thus, ‘but’ expresses the contrast between the expectation of Vikram and the actual outcome. Thus, [E] which uses ‘and’ as a conjunction is eliminated. If we assume the double negation (“hadn’t expected no criticism from her) in [B] to be fair and true, the placement of “but” causes a problem as there is no contrasting elements in the statement. If there was “and” in place of “but”, [B] would have been correct. Thus, the correct usage of words occurs only in [C]. Hence, [C] is the correct answer.

Q.20) The answer can be obtained from the following stanzas:

If someone asks, But what is love? Answer, dissolving the will.

True freedom comes to those who have escaped the question of freewill and fate.

These lines imply that “love” leads to “freedom” only if someone has dissolved the will and escaped the question of freewill and fate. Thus, when we take “opposite” to mean something which is “conflicting, contrasting, or incompatible”, love and freewill/ fate/ will take contrasting meanings. Hence, [A] is the correct answer.

Q.21) Focus on the following stanzas:

If someone asks, But what is love? Answer, dissolving the will.

True freedom comes to those who have escaped the question of freewill and fate.

...

Be clear like mirror holding nothing.

...

Be pure emptiness. What is inside of that? You ask. Silence is all I can say.

Lovers have some secrets they keep.

The above lines imply that lovers dissolve the will to attain pure emptiness. This is the only “secret” they keep, which, in reality, is no secret at all. All other options are eliminated as they go against what has been given in the poem. Hence, [B] is the correct answer.

Q.22) The last sentence states that, “The degree of erosion on coastline is a function of the average impact of waves...” The sentence prior to that tells us that, “The average impact of waves against a coastline is a function of ... the shape of the sea bottom”. From these two sentences, it can be concluded that the degree of erosion on coastline is related to the shape of the sea-bottom. Hence, [E] is the correct answer.

Q.23) The passage focuses on the tradition of Dharma. It states that the treatment of human values and Dharmas go hand-in-hand in the Indian context and that, “Indian religious and ethical space is different from that of the western countries”. Any statement that negates this conclusion will make the passage redundant. [E] states that western ethical and religious space has also had a long tradition of treatment of human values and Dharma. This goes against the argument made in the passage. Hence, [E] is the correct answer.

Q.24) A logical fallacy is an error in reasoning that will undermine the logic of the argument under discussion. [A] is clearly eliminated as “one of the participants being open to new ideas” cannot be extrapolated to mean that such a training programme should do well for all participants. [B] indulges in the fallacy of ‘Appeal to Authority’. Here, a claimed authority’s support is used as evidence for an argument’s conclusion. Thus, [B] is rejected. [D] suffers from the ‘False Dilemma/False Dichotomy’ fallacy. This limits the options to two when there may be more options to choose from. [E] is an example of a straw man fallacy. In this case, no evidence of any benefit of the training programme is presented. On the other hand, it is implied that those who do not approve of this training program are not concerned about the organization. Only [C] presents believable evidence in favour of the training program. Hence, [C] is the correct answer.

Q.25) [1] is eliminated as we cannot state that playing a music instrument is a “unique” experience. The comparison with vocalists is inappropriate as there is no information given about them. Hence, [2] is rejected. [3] is clearly implied in the passage: “Unlike brain-games, playing an instrument is a rich and complex Experience”. [4] is incorrect as the passage only states that integrating the five senses can

result in long-lasting changes in the brain which “can be applicable in the business world”. Nothing in the passage suggests that it is a “crucial” element. Hence, [4] is not valid. Hence, [A] is the correct answer.

Q.26) ‘Nonchalant’ or ‘insouciant’ refers to someone who is feeling or appearing casually calm and relaxed. ‘Philippic’ means ‘a bitter attack or denunciation’. ‘Ennui’ means a ‘feeling of listlessness and dissatisfaction arising from a lack of occupation or excitement’. Thus only, ‘nonchalant’ or ‘insouciant’ can be used to describe a person as ‘Ennui’ and ‘Philippic’ are feelings. Thus, [C] and [D] are eliminated. Similarly, one cannot indulge in ‘Ennui’ or ‘Philippic’ with one’s boss. ‘Remonstrance’ means saying or pleading in protest, objection, or disapproval. It fits the second blank perfectly. Hence, [B] and [E] are eliminated. ‘Philippic’ and ‘Ennui’ fit the third and fourth blanks perfectly. Hence, [A] is the correct answer.

## SECTION-II

### DECISION MAKING ABILITY

Q.1) The question may seem tricky at first glance. Here, Sayed believes that Palani was transferred due to his poor performance in the previous branch. Thus, he fears that Palani's transfer may pull down the performance of the branch. Any option that can state that the performance of the branch will not suffer due to Palani will help in assuaging Sayed's fear. [B], [C] and [D] do not help in this. Between [A] and [E], the former is a better choice as it implies that irrespective of the employees who joined his team, Satyender has exceeded targets every time in the past twelve years. Thus, even if Palani does not perform well, it is possible that the performance of the branch will not suffer. Though [E] appears close, it does not address the fear of Sayed that Palani's transfer may affect the performance of the branch in a negative manner. Hence, [A] is the correct answer.

Q.2) The question implies that Satyender had some bill amount in mind before receiving Palani's travel bills which were 30% higher than expected. Any option that states that Palani's bills were reasonable will enable Satyender to approve the same (higher bills) and to take a fair decision that will set a precedent. If Palani has to repeatedly visit customers as they require additional persuasion, it would be obvious that he would be spending more time and money on travelling; approving a higher travel bill in such a situation is justified. Hence, [E] is a fair decision that ensures that a fair precedent will be set. The other options do not offer suitable justifications for the higher travel bill. Hence, [E] is the correct answer.

Q.3) Satyender has three collection officers - Palani, Sayed, and Godwin. He has to decide on Palani's performance and take a fair allocation decision. For this, he needs specific details on performance of the three officers. Any option that does not give relevant details will be of little use. [A], [B], [D] and [E]

provide measurable information about Sayed and Goldwin's territories. However, [C] is vague as it does not specify the territory that is facing competition from two relatively unknown brands. Thus, [C] is least useful to Satyender. Hence, [C] is the right answer.

Q.4) SudarshanLal is worried that two of his three companies are in the red. However, if a leading financial institution has advised its investors to purchase the shares of these two loss-making companies with a long-term outlook, it is understood that they may overturn their losses and post good profits in the future. Thus [A] is helpful in the given situation. [B] does not address SudarshanLal's concerns at all. Similarly, [C] does not talk about the two loss-making companies. [D] and [E] only talk about employees. They don't help in providing clarity on the two loss-making companies. Hence, [A] is the correct answer.

Q.5) [A] only serves to strengthen the senior employees' allegations. Similarly, [C] and [D] reinforce the view that senior employees are not being respected. [E] is irrelevant to the situation as industry-wide attrition rate has no bearing on the situation at hand. [B], on the other hand, weakens the senior employees' allegations that they were not treated with respect. If the company offers challenging but critical positions to senior employees, it can only be out of a sense of respect for the senior employees' capabilities. Moreover, by offering such positions, there is no threat to their jobs as well. Thus, [B] indicates that the accusation of the senior employees is incorrect. Hence, [B] is the correct answer.

Q.6) If Chhaganlal is worried that the leaked information is having a detrimental effect, he is well within his right to request Sudarshan to wait for him to communicate the information by formal channels. By doing so, Chhaganlal can put his point across to Sudarshan in a dignified manner. Thus, [A] is a good course of action. [B] and [E] are unsuitable actions that will sully Chhaganlal's image and negatively impact the team or the company. [C] and [D] are not appropriate either, as they do not help in resolving the matter, i.e. countering alleged misinformation in a suitable manner. Hence, [A] is the correct answer.

Q.7) The question concerns the action by Emily and Rose which would delay Jonathan's plan of doubling the arms and ammunition with him. [A] does not address the issue directly. It also does not assist in delaying Jonathan's plans. [E] is inappropriate as well. [B] and [C] also do not address the purpose of Emily and Rose. However, if Emily and Rose attack Jonathan, his attention would be diverted towards fighting them. Thus, there will be a delay in Jonathan's plan to double the arms and ammunition with him. Hence, [D] is the correct answer.

Q.8) Jonathan can only do things which are under his control. Trying to get the other Queens to cooperate or sign a peace pact may not work out. Moreover, trying to create a rift between the two Queens does not help him to accomplish his ambition of annexing the Kingdom K. [E] is counter-

productive as he does not have sufficient arms at his disposal. Only [D] is an appropriate course of action for Jonathan to pursue in order to realize his dream. Hence, [D] is the correct answer.

Q.9) The warring tribes are slowing down the overall economic development of Kingdom K. King Summer Sault needs to take a few steps to focus on economic development. This would be possible only if he is able to reduce or eliminate the tension among the warring tribes. By developing annual economic plans, with each plan focusing on a particular tribe, he can try to improve the lot of the warring tribes. Though [C] suggests that the plans be “named” after each tribe, it is the closest to the appropriate course of action of having a dedicated plan for each tribe. As the problem is domestic, its solution would also have to be found locally. Internationalizing the issue will not help in resolving it. Thus aligning with Jonathan or the Queens to eliminate the tribes or instigating a civil war would be an extremely myopic and unjust action. Hence, [A], [B] and [D] have to be eliminated. [E] will not help in economic development as teachers, doctors, and artists can only improve education, health and other social parameters. Hence, [C] is the correct answer.

Q.10) The share price of Ratan Brothers has started falling as the shareholders believe the allegation of Dev and Sons that a bribe was paid by the current supplier to get the contract for ball bearings. The investors would be under the impression that the quality of such ball bearing would not be good. However, as Bhushan has stated that he switched to a new supplier because of deficiencies in Dev and Sons’ product, it will be appropriate for the company to declare that there was no decline in the company’s quality standards. Also, the company has to state that the shift in supplier has led to an increase and that anyone is welcome to scrutinize the relevant documents. Thus, the appropriate course of action is [C]. [A], [B] and [D] are counter-productive as they imply a wrongdoing from the part of the company. [E] is also incorrect as doing nothing is not an option when share prices are falling. Hence, [C] is the correct answer.

Trusted for Success

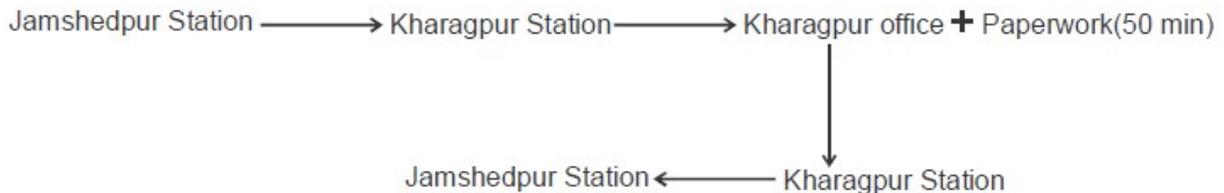
Q.11) In any such situation, doing nothing is not really an option. Hence, we should immediately rule out [A].

Similarly, [C] and [D] are counter-productive. As allegations against Bhushan have not been proven conclusively, it would be incorrect to sack him. Thus, [B] is not a correct course of action. Since there are rumours within the organization that the decision to exonerate Bhushan was influenced by nepotism, it is best to explain how the verdict was arrived at. Hence, [E] is the correct answer.

Q.12) Since a vigilance committee has discovered some financial irregularities attributable to Bhushan, people would start questioning the reasons behind his promotion in the company. There can also be negative speculations that Bhushan was promoted because he was Ava’s nephew. This may harm the company’s reputation. Thus, it would help the company to clarify that Bhushan was promoted because his initiatives helped the company immensely. Hence, [5] would be an appropriate starter. After this, the

company would have to terminate his services as he was found guilty of being party to some financial irregularities. Thus, [2] would follow next. Finally, to claim the moral high ground, Ava would have to offer her resignation as she was ultimately responsible as a CEO. Thus, [1] would be the last step. [3] cannot be followed as denying the occurrence of financial regularities is not an option since they have been proven by the vigilance committee. Also, [4] is not relevant in the context as the organization's financial health has not been called into question. Hence, A is the correct answer.

Q.13) He will travel in the following manner :-

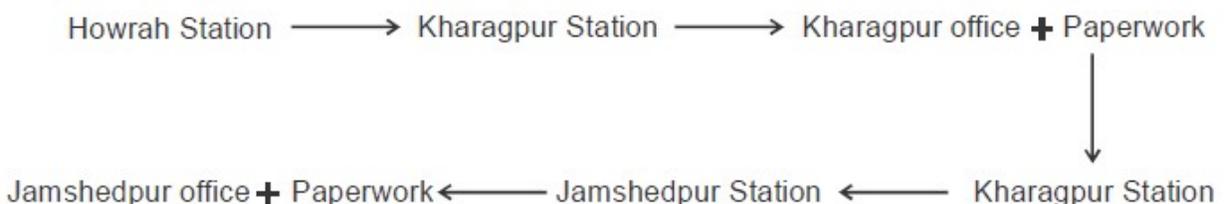


From Jamshedpur to Kharagpur, the best possible option is via Train T102 as it leaves Jamshedpur at 7:30 and reaches Kharagpur at 9:05 (1 hour 35 min). From here, 40 + 10 + 40 min = 90 min are spent in the time spent in reaching the office + paperwork + returning to Kharagpur Station. That is, 1.5 hours + 9:05 = 10:35. Train T102 leaves Kharagpur for Jamshedpur at 10:40 am and reaches at 12:35 (1 hr 55 min).

Therefore, the minimum possible time taken is :- 1 hr 35 min (via T102) + 40 + 10 + 40 min + 1 hr 55 min (via T202) + 5 min (delay) = 5 hours 5 minutes.

Hence, [2].

Q.14) Here we have to find the option which takes the minimum time in completing the task. While comparing, we can ignore the time taken for reaching the office + paperwork as it is same for all the routes.



Let us analyse each option.

T201 :- 1 hr 45 min (via T201) + 40 min + 10 min + 40 min + 55 min delay (to catch T202) + 1 hr 55 min (via T202) + 40 min + 10 min = 6 hrs 55 minutes

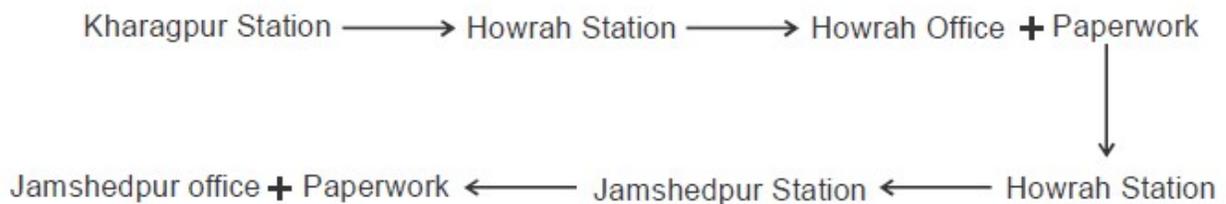
T202 :- 2 hr 10 min(via T202) + 40 + 10 + 40 + 5 min delay(to catch T203) + 1 hour 45 min(via T203) + 40 + 10min = 6 hrs 20 min

T 204 :- 1 hr 45 min(via T204) + 40 + 10 + 40 + 10 min delay(to catch T205) + 2 hr 5 min(via T205) + 40 + 10 min = 6 hrs 20 min

Therefore, T202 and T204 take the same time.

Hence, [5].

Q.15) He will travel in the following manner :-



Let us analyse each option :-

T102 :- 2 hr 5 min (via T102) + 40 +10 + 40 + 1 hr 50 min delay(to catch T204) + 3 hr 15 min (via T204) + 40 + 10 min = 9 hrs 30 min

T103 :- 2 hr 25 min (via T103) + 40 + 10 + 40 + 4 hrs(via T205) + 40 + 10 min = 8 hrs 45 min

T202, T203 will take much longer as their 1stcorresponding journeys take close to 11 hours.

Hence, [2].

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Q.16) A and B are claiming ownership over a natural resource that flows into C's jurisdiction. If they are compensated for this, it would only be a fair and equitable distribution if C is also allowed equal access to the resources available in A and B's jurisdiction. Thus, equal rights to all three over all resources would be the best way to resolve the dispute. Hence, [D] is the correct answer.

Q.17) The main issue that needs resolution is that A, B and C have to come to an agreement on how to fairly value and use each other's resources to construct the house. For this, they would have to trade the resources among them after arriving at their respective exchange values. Thus [3] is definitely an appropriate course of action. Options [1] and [2] do not aid in resolving the situation at all. Hence, [C] is the correct answer.

Q.18) Option [1] is, at best, a short-term solution for the problem at hand. Moreover, it does not help Pankaj's family to develop skills that can sustain them in the long term. Similarly, [5] does not resolve the situation. Also, it ends up burdening the employees. [4] is completely useless in helping Pankaj's family as the life insurance policy cannot provide them with financial stability immediately. Only [2] and [3] can help Pankaj's family find stability again. Hence, [B] is the correct answer.

Q.19) The question deals with arriving at a policy to deal with such incidents if they occur in the future. The best option would be including all the stakeholders so that a fair solution is obtained. Hence, (E) is the correct answer.

Q.20) This situation would require Madhuri's physical presence monitoring. Hence, (A) cannot be the answer. (B) will only increase the overall expense to the customer, which may be detrimental to the business. Since it is known that the cleaner is available during a particular time only, option (C) is not a correct solution.

Not doing anything, as [D] suggests, is not a good option. Option (E) is cost effective to Madhuri and would be handy to the customers as well. Hence, (E) is the correct answer.

Q.21) The guests are forgetting to return the key. Thus, Madhuri has to spend money and time to make a duplicate key. The solution here is to ensure that her customers do not forget to return the key. For this (E) is the best option. Hence, (E) is the correct answer.

### SECTION-III

#### DATA INTERPRETATION AND QUANTITATIVE ABILITY

Q.1)  $10 + 10^3 + 10^6 + 10^9 = 10 + 1000 + 1000000 + 1000000000 = 1001001010$

Hence, [D]

Q.2) Let the total units of work = LCM of (10, 12, 15 and 18) = 180

Therefore, work done by Abdul, Bimal, Charlie and Dilbar individually in one day will be 18 units, 15 units, 12 units and 10 units respectively. Let's look at the options.

Option A: Total work done =  $2 \times (18 + 15 + 12 + 10) = 110$  units

Option B: Total work done =  $1 \times (15 + 10) + 2 \times 12 + 3 \times 18 = 25 + 24 + 54 = 103$  units

Option C: Total work done =  $2 \times (18 + 2) + 1 \times 10 + 3 \times 15 = 40 + 10 + 45 = 95$  units

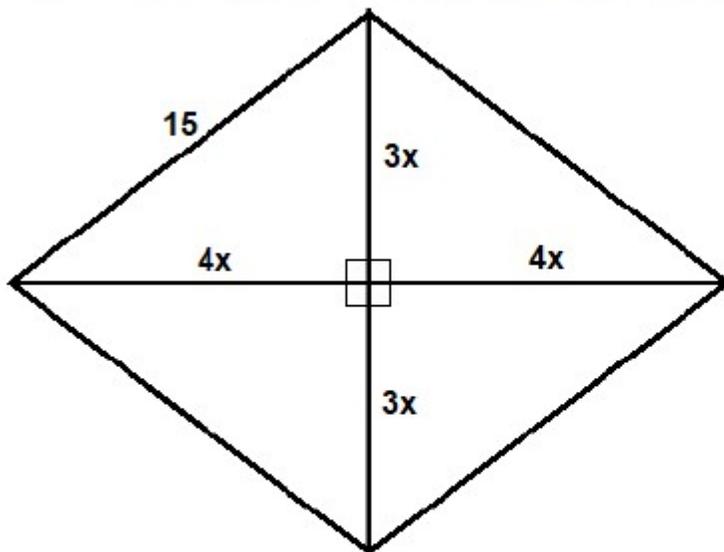
Option D: Total work done =  $2 \times (18 + 10) + 1 \times 12 + 3 \times 15 = 56 + 12 + 45 = 113$  units

Option E: Total work done =  $1 \times (18 + 12) + 2 \times 15 + 3 \times 10 = 30 + 30 + 30 = 90$  units

Hence, [E]

Q.3)

We know that the diagonals of a rhombus bisect each other at right angles.  
So let's assume that the two diagonals have lengths  $6x$  and  $8x$ .



Using Pythagoras theorem, we get  $\sqrt{(3x)^2 + (4x)^2} = 5x = 15$

$$\therefore x = 3$$

$\therefore$  The length of the diagonals are  $18$  and  $24$ .

$\therefore$  Area of the rhombus =  $0.5 \times$  product of the diagonals =  $0.5 \times 18 \times 24 = 216$

Hence, [E]

Q.4)

$$\text{We have } P \times \left( \frac{100 + X}{100} \right) \times \left( \frac{100 - Y}{100} \right) = P$$

Now  $Y$  has to be less than  $X$  for the above equation to be true.

We are also given that  $X - Y = Y$ .

$$\therefore X = 2Y$$

$$\therefore \left( \frac{100 + 2Y}{100} \right) = \left( \frac{100}{100 - Y} \right)$$

$$\therefore 10000 - 100Y + 200Y - 2Y^2 = 10000$$

$$\therefore Y^2 = 50Y$$

$$\therefore Y = 50 \text{ and } X = 100$$

Hence, [D]

Q.5)

Let the total volume of the mixture be  $12x$  ml.

∴ Volume of water, liquid A and liquid B in the mixture will be  $4x$ ,  $5x$  and  $3x$  respectively.

Ratio of liquids A and B in the residual mixture is  $7 : 9$ . But the volume of liquid B remains unchanged. Let the volume of liquid A that remained be  $M$ .

$$\therefore \frac{M}{3x} = \frac{7}{9}$$

$$\therefore M = \frac{7x}{3}$$

$$\therefore \text{Volume of liquid A that was absorbed} = 5x - \frac{7x}{3} = \frac{8x}{3}$$

$$\therefore 4x + \frac{8x}{3} = 200$$

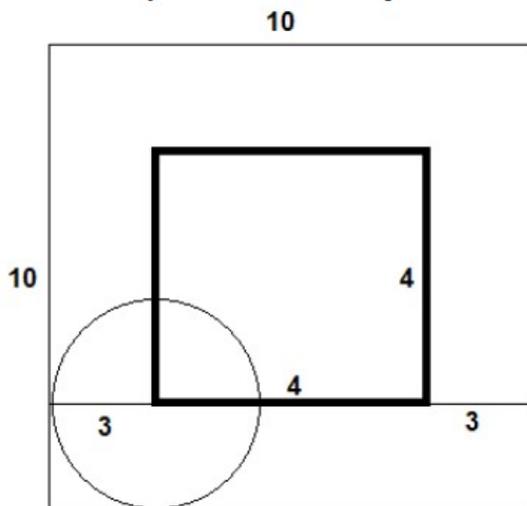
$$\therefore x = 30$$

Volume of water absorbed =  $4 \times 30 = 120$  ml

Hence, [E]

Q.6)

Let's consider one of the tiles with side  $10$  cm. For the coin to land completely within the tile, its centre should fall anywhere inside the square of side  $4$  cm.



$$\therefore \text{Favourable area} = 4 \times 4 = 16$$

$$\text{Total area available} = 10 \times 10 = 100$$

$$\therefore \text{Required probability} = 0.16$$

Hence, [E].

Q.7)

Total outer surface area of a sphere of radius  $r = 4\pi r^2$

When the sphere is cut into 4 identical pieces, each piece will expose  $\frac{\pi r^2}{2} + \frac{\pi r^2}{2} = \pi r^2$  area more.

∴  $4\pi r^2$  additional area needs to be painted.

∴ 4 litres of paint will be needed.

Hence, [D]

Q.8)

Let us assume that the person walks from A to B.

So the distance  $AB = 30V_1$  (ignore units as all times are in minutes).

In the second case, he walks at  $V_1$  for 10 minutes and at  $V_2$  for 30 minutes.

$$\therefore 10V_1 + 30V_2 = 30V_1$$

$$\therefore V_1 = 1.5V_2$$

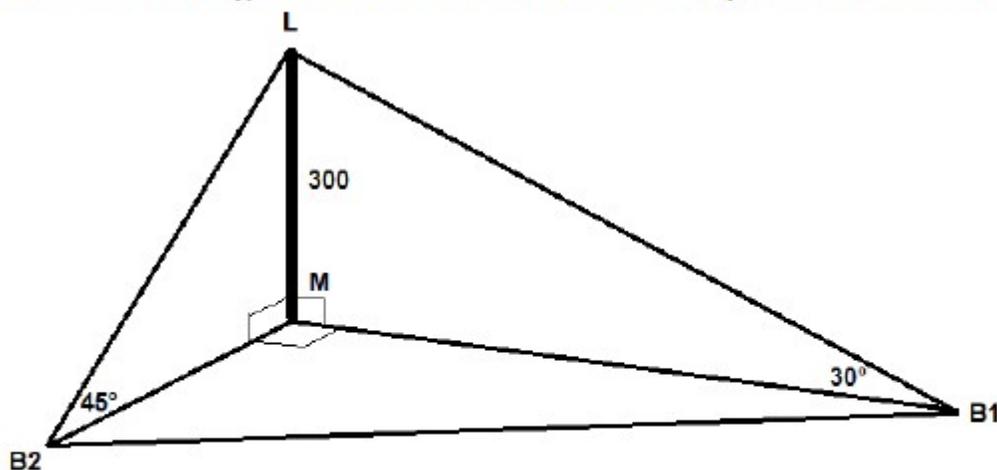
$$\therefore \text{Average speed in the second case} = \frac{\text{Total Distance}}{\text{Total Time}} = \frac{30V_1}{45} = \frac{30 \times 1.5V_2}{45} = V_2$$

$\therefore$  Required ratio = 1 : 1

Hence, [A]

Q.9)

Let LM be the lighthouse and B1 and B2 be the positions of the two boats.



In  $\Delta LMB1$ ,  $MB1 = 300\sqrt{3}$  and in  $\Delta LMB2$ ,  $MB2 = 300$

In  $\Delta B1MB2$ ,  $B1B2 = \sqrt{300^2 + (300\sqrt{3})^2} = 600$

Hence, [D]

Q.10)

Since the product of the roots of one of the equations is 35, the roots can be 1 and 35 or 5 and 7. So we have the following cases:

Equation 1		Equation 2	
Common Root	Other Root	Common Root	Other Root
1	35	1	5
5	7	5	29
7	5	7	29
35	1	35	5

Thus, we can see that 5 is definitely one of the roots.

Hence, [C]

Q.11)

Observe the following times.

	First Difference (in mins)	Second Difference (in mins)
1.55		
2.03	8	
2.11	8	0
2.24	13	5
2.45	21	8
3.19	34	13
4.14	55	21

Thus, we see that "5" is missing in the first difference. Therefore, the missing time is 5 minutes before 2.03, that is, 1.58. Hence, [B]

Q.12)

Let the number of girls in the school originally be 'g'.

∴ The number of boys =  $g + 30$

Let the number of new girls who joined =  $x$

$$\therefore \frac{g+30}{g+x} = \frac{3}{5}$$

$$\therefore 5g + 150 = 3g + 3x$$

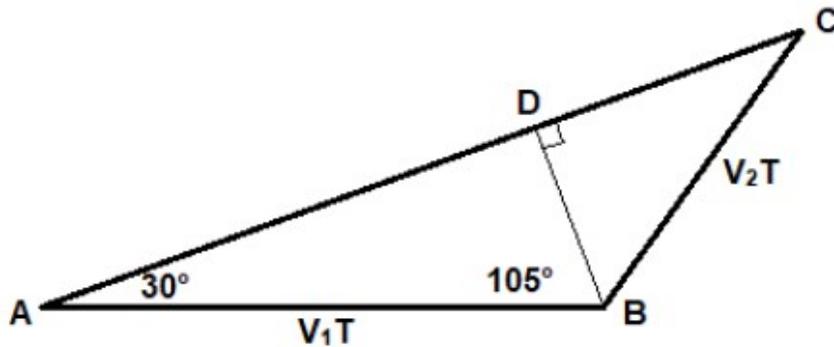
$$\therefore x = \frac{2}{3}g + 50$$

∴ The minimum value of  $x = 52$ .

Hence, [C]

Q.13)

Distance  $AB = V_1T$  and distance  $BC = V_2T$



$$\angle ACB = 180 - 30 - 105 = 45^\circ$$

Let  $BD$  be drawn perpendicular to  $AC$ .

$$\text{In } \triangle BDA, BD = AB \sin 45^\circ = \frac{1}{\sqrt{2}} V_1T \text{ and } AD = AB \cos 45^\circ = \frac{1}{\sqrt{2}} V_1T$$

$$\text{In } \triangle BDC, BD = BC \sin 30^\circ = \frac{1}{2} V_2T \text{ and } DC = BC \cos 30^\circ = \frac{\sqrt{3}}{2} V_2T$$

$$\therefore \frac{1}{\sqrt{2}} V_1T = \frac{1}{2} V_2T$$

$$\therefore V_1 = \frac{1}{\sqrt{2}} V_2$$

$$\therefore AC = AD + DC = \frac{1}{\sqrt{2}} V_1T + \frac{\sqrt{3}}{2} V_2T = \frac{1}{2} V_2T + \frac{\sqrt{3}}{2} V_2T = \left( \frac{\sqrt{3} + 1}{2} \right) V_2T$$

$$\therefore \text{Time taken to travel from } C \text{ to } A \text{ at speed } V_2 = \frac{AC}{V_2} = \left( \frac{\sqrt{3} + 1}{2} \right) T = 0.5(\sqrt{3} + 1)T$$

Hence, [C]

Q.14)

There are two cases to be considered.

**Case 1:** The maximum number of registrations for a course = 70

∴ The total number of students = 70 and the number of student-course combinations =  $3 \times 70 = 210$

∴  $70 + 55 + 45 + X = 210$

∴  $X = 40$

Therefore, the minimum registrations for a course = 40.

**Case 2:** The maximum number of registrations for a course is a number Y greater than 70.

∴ The total number of students = Y and the number of student-course combinations = 3Y

∴  $Y + 70 + 55 + 45 = 3Y$

∴  $2Y = 170$

∴  $Y = 85$

Therefore, the minimum registrations for a course = 45.

Hence, [E]

*Note: The official answer key by XAT was option [B].*

Q.15)

Since the digits at the unit's place of the numbers  $(408X)^{63}$  and  $(789Y)^{85}$  are the same, X and Y are either both even or both odd. So we can have the following table.

X/Y	Unit's digit of $(408X)^{63}$	Unit's digit of $(789Y)^{85}$
1	1	1
2	8	2
3	7	3
4	4	4
5	5	5
6	6	6
7	3	7
8	2	8
9	9	9

Therefore, we see that the values of X and Y (in no particular order) can be 2 and 8 or 3 and 7. In either case, the value of  $(X + Y)$  is 10.

Hence, [B]

Q.16)

Since  $2 \leq |x - 1| \times |y + 3| \leq 5$ , the value of  $|x - 1| \times |y + 3|$  can be 2, 3, 4 or 5. Thus, we have the following possibilities.

$ x - 1  \times  y + 3 $	$ x - 1 $	$ y + 3 $	x	y
2	2	1	-1	-4, -2
3	3	1	-4	-4, -2
4	4	1	-5	-4, -2
	2	2	-1	-1, -5
5	5	1	-6	-4, -2

So, there are 10 possible combinations of x and y.  
Hence, [E]

Q.17)

Observe that the sum of four consecutive numbers cannot be divisible by 4. But  $2^N$  is always divisible by 4 (for  $N \geq 2$ ). Therefore, the four consecutive days do not fall in the same month. Let's look at the various possibilities.

Days	Sum
28, 29, 30, 1	88
29, 30, 1, 2	62
30, 1, 2, 3	36
29, 30, 31, 1	91
30, 31, 1, 2	$64 = 2^6$
31, 1, 2, 3	37
26, 27, 28, 1	82
27, 28, 1, 2	58
28, 1, 2, 3	34
27, 28, 29, 1	85
28, 29, 1, 2	60
29, 1, 2, 3	35

Hence, [B]

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Q.18)

Curved surface area of the original larger cone =  $\pi \times \text{Radius} \times \text{Slant height} = 48\pi$

Therefore, the curved surface of the smaller cone =  $\frac{1}{1+2} \times 48\pi = 16\pi$

Now, the radius and slant of height of the smaller cone would be reduced in equal proportions from the larger cone.

Therefore, each of them would be  $\frac{1}{\sqrt{3}}$  times the corresponding values of the larger cone.

Therefore, slant height of the frustum =  $\left(1 - \frac{1}{\sqrt{3}}\right) \times 12 = \left(\frac{\sqrt{3}-1}{\sqrt{3}}\right) \times 12 = 12 - 4\sqrt{3}$

Hence, [D]

Q.19)

We can represent the given information using the figure below.

Area of the common region = Area of segment APBN + Area of  $\Delta ANM$  + Area of the major sector AMB

Consider the larger circle. Area of segment APBN =  $\frac{1}{2} \times r^2 \times (\theta - \sin\theta) = \frac{1}{2} \times (2R)^2 \times \left(\frac{\pi}{3} - \frac{\sqrt{3}}{2}\right) = \frac{2\pi - 3\sqrt{3}}{3} R^2$

Now, in  $\Delta ANO$ ,  $AN = AO \sin 30^\circ = 2R \times 0.5 = R$ .

In  $\Delta ANM$ , since  $AN = R$  and  $AM = \sqrt{2} R$ ,  $\Delta ANM$  is an isosceles right triangle. Therefore,  $MN = R$ .

$\therefore$  Area of  $\Delta ANM = \frac{1}{2} \times \sqrt{2}R \times \sqrt{2}R = R^2$

Consider the smaller circle. Area of the major sector AMB =  $\frac{1}{2} \times r^2 \times \theta = \frac{1}{2} \times (\sqrt{2}R)^2 \times \frac{3\pi}{2} = \frac{3\pi}{2} R^2$

Required area =  $\frac{2\pi - 3\sqrt{3}}{3} R^2 + R^2 + \frac{3\pi}{2} R^2 = \frac{4\pi - 6\sqrt{3} + 6 + 9\pi}{6} R^2 = \frac{13\pi + 6 - 6\sqrt{3}}{6} R^2 = \left(\frac{13\pi}{6} + 1 - \sqrt{3}\right) R^2$

Hence, [C]

Q.20)

From statement I alone, the sum of their ages lies between  $(6 \times 50)$  and  $(6 \times 85)$ , that is, 300 and 510. The only square of a prime number lying in this range is  $19^2 = 381$ . Therefore, the average of their ages =  $\frac{381}{6}$ . Therefore, the question can be answered using statement I alone.

From statement II alone,  $4.6 = \sqrt{\frac{\sum (x_i - \bar{x})^2}{6}}$ . Since there are two unknowns here, the question cannot be answered using this statement alone.

Hence, [A]

Q.21)

The sum of all the 10 cards = 55.

From statement I alone, the sum of the numbers picked by Harry is 30 and that picked by Sunny is 25. Now, a sum of 30 can be obtained if the cards picked are 2, 3, 7, 8 and 10. A sum of 25 can be obtained if the cards picked are 2, 3, 4, 6 and 10. So we cannot determine who picked card number 2.

From statement II alone, we cannot ascertain who picked card number 2.

If we combine both the statements, the person who picked 4 even-numbered cards can have the following combinations:

1. 2, 4, 6, 8, X (Sum = 20 + X): X has to be 5 so 2 was picked up by Sunny.
2. 2, 4, 6, 10, X (Sum = 22 + X): X has to be 3 so 2 was picked up by Sunny.
3. 2, 4, 8, 10, X (Sum = 24 + X): X has to be 1 so 2 was picked up by Sunny.
4. 2, 6, 8, 10, X (Sum = 26 + X): This case is not possible.
5. 4, 6, 8, 10, X (Sum = 28 + X): This case is not possible.

Therefore, both statements together are required to answer the question.

Hence, [D]

Q.22)

We see that team D drew matches with both teams B (1-1) and C (0-0).  
 Team A must have played matches with both teams E and F and won them.  
 Since team B drew 1-1 with team D, team B must have won the other game 4-0. This is possible only if it won against team F.  
 Since team C drew 0-0 with D, team C must have won the other game against team E 2-0.

Thus we get the following table (YTP = Yet to play)

	A	B	C	D	E	F	Goals Scored
A	X	YTP	YTP	YTP	P-1	(5-P)-0	5
B	YTP	X	YTP	1-1	YTP	4-0	5
C	YTP	YTP	X	0-0	2-0	YTP	2
D	YTP	1-1	0-0	X	YTP	YTP	1
E	1-P	YTP	0-2	YTP	X	YTP	1
F	0-(5-P)	0-4	YTP	YTP	YTP	X	0
Goals Conceded	1	1	0	1	4	7	

Thus,  $P = 2$ .

Hence, [E]



Q.23)

We see that team D drew matches with both teams B (1-1) and C (0-0).  
 Team A must have played matches with both teams E and F and won them.  
 Since team B drew 1-1 with team D, team B must have won the other game 4-0. This is possible only if it won against team F.  
 Since team C drew 0-0 with D, team C must have won the other game against team E 2-0.

Thus we get the following table (YTP = Yet to play)

	A	B	C	D	E	F	Goals Scored
A	X	YTP	YTP	YTP	P-1	(5-P)-0	5
B	YTP	X	YTP	1-1	YTP	4-0	5
C	YTP	YTP	X	0-0	2-0	YTP	2
D	YTP	1-1	0-0	X	YTP	YTP	1
E	1-P	YTP	0-2	YTP	X	YTP	1
F	0-(5-P)	0-4	YTP	YTP	YTP	X	0
Goals Conceded	1	1	0	1	4	7	

Thus,  $P = 2$ .

Hence, [B]

Q.24)

We see that team D drew matches with both teams B (1-1) and C (0-0).

Team A must have played matches with both teams E and F and won them.

Since team B drew 1-1 with team D, team B must have won the other game 4-0. This is possible only if it won against team F.

Since team C drew 0-0 with D, team C must have won the other game against team E 2-0.

Thus we get the following table (YTP = Yet to play)

	A	B	C	D	E	F	Goals Scored
A	X	YTP	YTP	YTP	P-1	$(5-P)-0$	5
B	YTP	X	YTP	1-1	YTP	4-0	5
C	YTP	YTP	X	0-0	2-0	YTP	2
D	YTP	1-1	0-0	X	YTP	YTP	1
E	1-P	YTP	0-2	YTP	X	YTP	1
F	$0-(5-P)$	0-4	YTP	YTP	YTP	X	0
Goals Conceded	1	1	0	1	4	7	

Thus,  $P = 2$ .

Hence, [A]

Q.25)

Option A: Growth is from 4 to 6.5.

Option B: Growth is from 5 to 8.

Option C: Growth is from 4 to 7.

Option D: Growth is from 5.5 to 9.

Clearly, maximum growth is from 4 to 7.

Hence, [C]

Q.26)

For Prof. Arithmetic, it occurs in years 2014 and 2016.

For Prof. Algebra, it occurs in years 2012, 2015 and 2016.

For Prof. Geometry, it occurs in years 2011 and 2014.

For Prof. Calculus, it occurs in years 2011 and 2015.

Therefore, there are 9 instances.

Hence, [C]

Q.27)

Since cumulative time spent per year on research and teaching activities is the same for all professors, we'll directly take the percentages for calculations.

$$\text{Research efficiency of Prof. Arithmetic} = \frac{2+3+3}{70+50+60} = \frac{8}{180}$$

$$\text{Research efficiency of Prof. Algebra} = \frac{3+2+3}{35+25+40} = \frac{8}{100}$$

$$\text{Research efficiency of Prof. Geometry} = \frac{3+1+4}{75+25+20} = \frac{8}{120}$$

$$\text{Research efficiency of Prof. Calculus} = \frac{3+3+2}{55+55+40} = \frac{8}{150}$$

∴ The least efficient is Prof. Arithmetic.

Hence, [A]

## PART-B

### SECTION-I

#### GENERAL AWARENESS

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Q.1) Hence, [D].

Q.2) Hence, [A].

Q.3) Hence, [C].

Q.4) Hence, [E].

Q.5) Hence, [A].

Q.6) Hence, [D].

Q.7) Hence, [B].

Q.8) Hence, [B].

Q.9) Hence, [E].

Q.10) Hence, [E].

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Q.11) Hence, [D].

Q.12) Hence, [D].

Q.13) Hence, [E].

Q.14) Hence, [C].

Q.15) Hence, [A].

Q.16) Hence, [E].

Q.17) Hence, [E].

Q.18) Hence, [C].

Q.19) Hence, [E].

Q.20) Hence, [A].

Q.21) Hence, [C].

Q.22) Hence, [A].

Q.23) Hence, [D].

Q.24) Hence, [E].

Q.25) Hence, [B].



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