

CAT 2022 SLOT 1 VARC

DIRECTIONS for the questions 1 - 4: The passage below is accompanied by a set of questions. Choose the best answer to each question.

Critical theory of technology is a political theory of modernity with a normative dimension. It belongs to a tradition extending from Marx to Foucault and Habermas according to which advances in the formal claims of human rights take centre stage while in the background centralization of ever more powerful public institutions and private organizations imposes an authoritarian social order.

Marx attributed this trajectory to the capitalist rationalization of production. Today it marks many institutions besides the factory and every modern political system, including so-called socialist systems. This trajectory arose from the problems of command over a disempowered and deskilled labour force; but everywhere [that] masses are organized – whether it be Foucault’s prisons or Habermas’s public sphere – the same pattern prevails. Technological design and development is shaped by this pattern as the material base of a distinctive social order. Marcuse would later point to a “project” as the basis of what he called rather confusingly “technological rationality.” Releasing technology from this project is a democratic political task.

In accordance with this general line of thought, critical theory of technology regards technologies as an environment rather than as a collection of tools. We live today with and even within technologies that determine our way of life. Along with the constant pressures to build centres of power, many other social values and meanings are inscribed in technological design. A hermeneutics of technology must make explicit the meanings implicit in the devices we use and the rituals they script. Social histories of technologies such as the bicycle, artificial lighting or firearms have made important contributions to this type of analysis. Critical theory of technology attempts to build a methodological approach on the lessons of these histories.

As an environment, technologies shape their inhabitants. In this respect, they are comparable to laws and customs. Each of these institutions can be said to represent those who live under their sway through privileging certain dimensions of their human nature. Laws of property represent the interest in ownership and control. Customs such as parental authority represent the interest of childhood in safety and growth. Similarly, the automobile represents its users in so far as they are interested in mobility. Interests such as these constitute the version of human nature sanctioned by society.

This notion of representation does not imply an eternal human nature. The concept of nature as non-identity in the Frankfurt School suggests an alternative. On these terms, nature is what lies at the limit of history, at the point at which society loses the capacity to imprint its meanings on things and control them effectively. The reference here is, of course, not to the nature of natural science, but to the lived nature in which we find ourselves and which we are. This nature reveals itself as that which cannot be totally encompassed by the machinery of society. For the Frankfurt School, human nature, in all its transcending force, emerges out of a historical context as that context is [depicted] in illicit joys, struggles and pathologies. We can perhaps admit a less romantic . . . conception in which those dimensions of human nature recognized by society are also granted theoretical legitimacy.

1. Which one of the following statements best reflects the main argument of the fourth paragraph of the passage?
 - A. Technology, laws, and customs are not unlike each other if considered as institutions.
 - B. Technological environments privilege certain dimensions of human nature as effectively as laws and customs.

- C. Technology, laws, and customs are comparable, but dissimilar phenomena.
D. Automobiles represent the interest in mobility present in human nature.
2. All of the following claims can be inferred from the passage, EXCEPT:
- A. the significance of parental authority to children's safety does not therefore imply that parental authority is a permanent aspect of human nature.
 - B. analyses of technologies must engage with their social histories to be able to reveal their implicit and explicit meanings for us.
 - C. technologies seek to privilege certain dimensions of human nature at a high cost to lived nature
 - D. the critical theory of technology argues that, as issues of human rights become more prominent, we lose sight of the ways in which the social order becomes more authoritarian.
3. Which one of the following statements could be inferred as supporting the arguments of the passage?
- A. Technologies form the environmental context and shape the contours of human society.
 - B. The romantic conception of nature referred to by the passage is the one that requires theoretical legitimacy.
 - C. Nature decides the point at which society loses its capacity to control history.
 - D. It is not human nature, but human culture that is represented by institutions such as law and custom
4. Which one of the following statements contradicts the arguments of the passage?
- A. The problems of command over a disempowered and deskilled labour force gave rise to similar patterns of the capitalist rationalisation of production wherever masses were organised.
 - B. Paradoxically, the capitalist rationalisation of production is a mark of so-called socialist systems as well.
 - C. Masses are organised in patterns set by Foucault's prisons and Habermas' public sphere.
 - D. Marx's understanding of the capitalist rationalisation of production and Marcuse's understanding of a "project" of "technological rationality" share theoretical inclinations.

DIRECTIONS for the questions 5 - 8: The passage below is accompanied by a set of questions. Choose the best answer to each question.

Stoicism was founded in 300 BC by the Greek philosopher Zeno and survived into the Roman era until about AD 300. According to the Stoics, emotions consist of two movements. The first movement is the immediate feeling and other reactions (e.g., physiological response) that occur when a stimulus or event occurs. For instance, consider what could have happened if an army general accused Marcus Aurelius of treason in front of other officers. The first movement for Marcus may have been (internal) surprise and anger in response to this insult, accompanied perhaps by some involuntary physiological and expressive responses such as face flushing and a movement of the eyebrows. The second movement is what one does next about the emotion. Second movement behaviours occur after thinking and are under one's control. Examples of second movements for Marcus might have included a plot to seek revenge, actions signifying deference and appeasement, or perhaps proceeding as he would have proceeded whether or not this event occurred: continuing to lead the Romans in a way that Marcus Aurelius believed best benefited them. In the Stoic view, choosing a reasoned, unemotional response as the second movement is the only appropriate response.

The Stoics believed that to live the good life and be a good person, we need to free ourselves of nearly all desires such as too much desire for money, power, or sexual gratification. Prior to second

movements, we can consider what is important in life. Money, power, and excessive sexual gratification are not important. Character, rationality, and kindness are important. The Epicureans, first associated with the Greek philosopher Epicurus . . . held a similar view, believing that people should enjoy simple pleasures, such as good conversation, friendship, food, and wine, but not be indulgent in these pursuits and not follow passion for those things that hold no real value like power and money. As Oatley (2004) states, “the Epicureans articulated a view—enjoyment of relationship with friends, of things that are real rather than illusory, simple rather than artificially inflated, possible rather than vanishingly unlikely—that is certainly relevant today” . . . In sum, these ancient Greek and Roman philosophers saw emotions, especially strong ones, as potentially dangerous. They viewed emotions as experiences that needed to be [reined] in and controlled.

As Oatley (2004) points out, the Stoic idea bears some similarity to Buddhism. Buddha, living in India in the 6th century BC, argued for cultivating a certain attitude that decreases the probability of (in Stoic terms) destructive second movements. Through meditation and the right attitude, one allows emotions to happen to oneself (it is impossible to prevent this), but one is advised to observe the emotions without necessarily acting on them; one achieves some distance and decides what has value and what does not have value. Additionally, the Stoic idea of developing virtue in oneself, of becoming a good person, which the Stoics believed we could do because we have a touch of the divine, laid the foundation for the three monotheistic religions: Judaism, Christianity, and Islam . . . As with Stoicism, tenets of these religions include controlling our emotions lest we engage in sinful behaviour.

5. On the basis of the passage, which one of the following statements can be regarded as true?
 - A. The Stoic influences can be seen in multiple religions.
 - B. The Stoics valorised the pursuit of money, power, and sexual gratification.
 - C. There were no Stoics in India at the time of the Roman civilisation.
 - D. The Epicureans believed in controlling all emotions.

6. Which one of the following statements would be an accurate inference from the example of Marcus Aurelius?
 - A. Marcus Aurelius plotted revenge in his quest for justice.
 - B. Marcus Aurelius was one of the leaders of the Roman army.
 - C. Marcus Aurelius was humiliated by the accusation of treason in front of the other officers.
 - D. Marcus Aurelius was a Stoic whose philosophy survived into the Roman era.

7. “Through meditation and the right attitude, one allows emotions to happen to oneself (it is impossible to prevent this), but one is advised to observe the emotions without necessarily acting on them; one achieves some distance and decides what has value and what does not have value.” In the context of the passage, which one of the following is not a possible implication of the quoted statement?
 - A. “Meditation and the right attitude”, in this instance, implies an initially passive reception of all experiences.
 - B. The observation of emotions in a distant manner corresponds to the second movement referred to earlier in the passage.
 - C. Emotional responses can make it difficult to distinguish valuable experiences from valueless experiences.
 - D. Meditation allows certain out-of-body experiences that permit us to gain the distance necessary to control our emotions.

8. Which one of the following statements, if false, could be seen as contradicting the facts/arguments in the passage?

- A. In the Epicurean view, indulging in simple pleasures is not desirable.
- B. In the Stoic view, choosing a reasoned, unemotional response as the first movement is an appropriate response to emotional situations.
- C. The Greek philosopher Zeno survived into the Roman era until about AD 300.
- D. Despite practising meditation and cultivating the right attitude, emotions cannot ever be controlled.

DIRECTIONS for the questions 9 - 12: The passage below is accompanied by a set of questions. Choose the best answer to each question.

Stories concerning the Undead have always been with us. From out of the primal darkness of Mankind's earliest years, come whispers of eerie creatures, not quite alive (or alive in a way which we can understand), yet not quite dead either. These may have been ancient and primitive deities who dwelt deep in the surrounding forests and in remote places, or simply those deceased who refused to remain in their tombs and who wandered about the countryside, physically tormenting and frightening those who were still alive. Mostly they were ill-defined—strange sounds in the night beyond the comforting glow of the fire, or a shape, half-glimpsed in the twilight along the edge of an encampment. They were vague and indistinct, but they were always there with the power to terrify and disturb. They had the power to touch the minds of our early ancestors and to fill them with dread. Such fear formed the basis of the earliest tales although the source and exact nature of such terrors still remained very vague.

And as Mankind became more sophisticated, leaving the gloom of their caves and forming themselves into recognizable communities—towns, cities, whole cultures—so the Undead travelled with them, inhabiting their folklore just as they had in former times. Now they began to take on more definite shapes. They became walking cadavers; the physical embodiment of former deities and things which had existed alongside Man since the Creation. Some still remained vague and ill-defined but, as Mankind strove to explain the horror which it felt towards them, such creatures emerged more readily into the light.

In order to confirm their abnormal status, many of the Undead were often accorded attributes, which defied the natural order of things—the power to transform themselves into other shapes, the ability to sustain themselves by drinking human blood, and the ability to influence human minds across a distance. Such powers—described as supernatural—only [lent] an added dimension to the terror that humans felt regarding them.

And it was only natural, too, that the Undead should become connected with the practice of magic. From very early times, Shamans and witchdoctors had claimed at least some power and control over the spirits of departed ancestors, and this has continued down into more “civilized” times. Formerly, the invisible spirits and forces that thronged around men's earliest encampments, had spoken “through” the tribal Shamans but now, as entities in their own right, they were subject to magical control and could be physically summoned by a competent sorcerer. However, the relationship between the magician and an Undead creature was often a very tenuous and uncertain one. Some sorcerers might have even become Undead entities once they died, but they might also have been susceptible to the powers of other magicians when they did.

From the Middle Ages and into the Age of Enlightenment, theories of the Undead continued to grow and develop. Their names became more familiar—werewolf, vampire, ghoul—each one certain to strike fear into the hearts of ordinary humans.

9. “In order to confirm their abnormal status, many of the Undead were often accorded attributes, which defied the natural order of things . . .” Which one of the following best expresses the claim made in this statement?
- A. Human beings conceptualise the Undead as possessing abnormal features.
 - B. The natural attributes of the Undead are rendered abnormal by changing their status.
 - C. The Undead are deified in nature’s order by giving them divine attributes.
 - D. According the Undead an abnormal status is to reject the natural order of things.
10. All of the following statements, if false, could be seen as being in accordance with the passage, EXCEPT:
- A. the relationship between Shamans and the Undead was believed to be a strong and stable one.
 - B. the transition from the Middle Ages to the Age of Enlightenment saw new theories of the Undead.
 - C. the growing sophistication of Mankind meant that humans stopped believing in the Undead.
 - D. the Undead remained vague and ill-defined, even as Mankind strove to understand the horror they inspired.
11. Which one of the following observations is a valid conclusion to draw from the statement, “From out of the primal darkness of Mankind’s earliest years, come whispers of eerie creatures, not quite alive (or alive in a way which we can understand), yet not quite dead either.”?
- A. Long ago, eerie creatures used to whisper in the primal darkness that they were not quite dead.
 - B. Mankind’s primal years were marked by creatures alive with eerie whispers, but seen only in the darkness.
 - C. Mankind’s early years were marked by a belief in the existence of eerie creatures that were neither quite alive nor dead.
 - D. We can understand the lives of the eerie creatures in Mankind’s early years through their whispers in the darkness.
12. Which one of the following statements best describes what the passage is about?
- A. The writer describes the ways in which the Undead come to be associated with Shamans and the practice of magic.
 - B. The writer discusses the transition from primitive thinking to the Age of Enlightenment.
 - C. The passage describes the failure of human beings to fully comprehend their environment.
 - D. The passage discusses the evolution of theories of the Undead from primitive thinking to the Age of Enlightenment.

DIRECTIONS for the questions 13 - 16: The passage below is accompanied by a set of questions. Choose the best answer to each question.

The Chinese have two different concepts of a copy. Fangzhipin . . . are imitations where the difference from the original is obvious. These are small models or copies that can be purchased in a museum shop, for example. The second concept for a copy is fuzhipin . . . They are exact reproductions of the original, which, for the Chinese, are of equal value to the original. It has absolutely no negative connotations. The discrepancy with regard to the understanding of what a copy is has often led to

misunderstandings and arguments between China and Western museums. The Chinese often send copies abroad instead of originals, in the firm belief that they are not essentially different from the originals. The rejection that then comes from the Western museums is perceived by the Chinese as an insult....

The Far Eastern notion of identity is also very confusing to the Western observer. The Ise Grand Shrine [in Japan] is 1,300 years old for the millions of Japanese people who go there on pilgrimage every year. But in reality this temple complex is completely rebuilt from scratch every 20 years. ..

The cathedral of Freiburg Minster in southwest Germany is covered in scaffolding almost all year round. The sandstone from which it is built is a very soft, porous material that does not withstand natural erosion by rain and wind. After a while, it crumbles. As a result, the cathedral is continually being examined for damage, and eroded stones are replaced. And in the cathedral's dedicated workshop, copies of the damaged sandstone figures are constantly being produced. Of course, attempts are made to preserve the stones from the Middle Ages for as long as possible. But at some point they, too, are removed and replaced with new stones.

Fundamentally, this is the same operation as with the Japanese shrine, except in this case the production of a replica takes place very slowly and over long periods of time. In the field of art as well, the idea of an unassailable original developed historically in the Western world. Back in the 17th century [in the West], excavated artworks from antiquity were treated quite differently from today. They were not restored in a way that was faithful to the original. Instead, there was massive intervention in these works, changing their appearance....

It is probably this intellectual position that explains why Asians have far fewer scruples about cloning than Europeans. The South Korean cloning researcher Hwang Woo-suk, who attracted worldwide attention with his cloning experiments in 2004, is a Buddhist. He found a great deal of support and followers among Buddhists, while Christians called for a ban on human cloning. Hwang legitimised his cloning experiments with his religious affiliation: 'I am Buddhist, and I have no philosophical problem with cloning. And as you know, the basis of Buddhism is that life is recycled through reincarnation. In some ways, I think, therapeutic cloning restarts the circle of life.'

13. Which one of the following scenarios is unlikely to follow from the arguments in the passage?
- A. A 20th century Japanese Buddhist monk would value a reconstructed shrine as the original.
 - B. A 21st century Christian scientist is likely to oppose cloning because of his philosophical orientation.
 - C. A 17th century British painter would have no problem adding personal touches when restoring an ancient Roman painting.
 - D. A 17th century French artist who adhered to a Christian worldview would need to be completely true to the original intent of a painting when restoring it.
14. The value that the modern West assigns to "an unassailable original" has resulted in all of the following EXCEPT:
- A. it discourages them from simultaneous displays of multiple copies of a painting.
 - B. it discourages them from making interventions in ancient art.
 - C. it allows regular employment for certain craftsmen.
 - D. it discourages them from carrying out human cloning.

15. Based on the passage, which one of the following copies would a Chinese museum be unlikely to consider as having less value than the original?

- A. Pablo Picasso's photograph of Vincent van Gogh's original painting, printed to exactly the same scale.
- B. Pablo Picasso's painting of Vincent van Gogh's original painting, bearing Picasso's signature.
- C. Pablo Picasso's painting of Vincent van Gogh's original painting, identical in every respect.
- D. Pablo Picasso's miniaturised, but otherwise faithful and accurate painting of Vincent van Gogh's original painting.

16. Which one of the following statements does not correctly express the similarity between the Ise Grand Shrine and the cathedral of Freiburg Minster?

- A. Both will one day be completely rebuilt.
- B. Both are continually undergoing restoration.
- C. Both were built as places of worship.
- D. Both can be regarded as very old structures.

17. **DIRECTIONS for the question: The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.**

Petitioning is an expeditious democratic tradition, used frequently in prior centuries, by which citizens can bring issues directly to governments. As expressions of collective voice, they support procedural democracy by shaping agendas. They can also recruit citizens to causes, give voice to the voteless, and apply the discipline of rhetorical argument that clarifies a point of view. By contrast, elections are limited in several respects: they involve only a few candidates, and thus fall far short of a representative democracy. Further, voters' choices are not specific to particular policies or laws, and elections are episodic, whereas the voice of the people needs to be heard and integrated constantly into democratic government.

- A. Petitioning is definitely more representative of the collective voice, and the functioning of democratic government could improve if we relied more on petitioning rather than holding periodic elections.
- B. Citizens become less inclined to petitioning as it enables vocal citizens to shape political agendas, but this needs to change to strengthen democracies today.
- C. By giving citizens greater control over shaping political and democratic agendas, political petitions are invaluable as they represent an ideal form of a representative democracy.
- D. Petitioning has been important to democratic functioning, as it supplements the electoral process by enabling ongoing engagement with the government.

18. **DIRECTIONS for the question: The four sentences (labelled 1,2,3 and 4) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of four numbers as your answer.**

- 1. Fish skin collagen has excellent thermo-stability and tensile strength making it ideal for use as bandage that adheres to the skin and adjusts to body movements.
- 2. Collagen, one of the main structural proteins in connective tissues in the human body, is well known for promoting skin regeneration.
- 3. Fish skin swims in here as diseases and bacteria that affect fish are different from most human pathogens.

4. The risk of introducing disease agents into other species through the use of pig and cow collagen proteins for wound healing has inhibited its broader applications in the medical field.

19. DIRECTIONS for the question: The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

All that we think we know about how life hangs together is really some kind of illusion that we have perpetrated on ourselves because of our limited vision. What appear to be inanimate objects such as stones turn out not only to be alive in the same way that we are, but also in many infinitesimal ways to be affected by stimuli just as humans are. The distinction between animate and inanimate simply cannot be made when you enter the world of quantum mechanics and try to determine how those apparent subatomic particles, of which you and everything else in our universe is composed, are all tied together. The point is that physics and metaphysics show there is a pattern to the universe that goes beyond our capacity to grasp it with our brains.

- A. Arbitrary distinctions between inanimate and animate objects disappear at the scale at which quantum mechanics works.
- B. The inanimate world is both sentient and cognizant like its animate counterpart.
- C. The effect of stimuli is similar in inanimate objects when compared to animate objects or living beings.
- D. Quantum physics indicates that an astigmatic view of reality results in erroneous assumptions about the universe.

20. DIRECTIONS for the question: The four sentences (labelled 1,2,3 and 4) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of four numbers as your answer.

- 1. The creative element in product design has become of paramount importance as it is one of the few ways a firm or industry can sustain a competitive advantage over its rivals.
- 2. In fact, the creative element in the value of world industry would be larger still, if we added the contribution of the creative element in other industries, such as the design of tech accessories.
- 3. The creative industry is receiving a lot of attention today as its growth rate is faster than that of the world economy as a whole.
- 4. It is for this reason that today's trade issues are increasingly involving intellectual property, as Western countries have an interest in protecting their revenues along with freeing trade in non-tangibles.

21. DIRECTIONS for the question: The four sentences (labelled 1,2,3 and 4) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of four numbers as your answer.

- 1. Some company leaders are basing their decisions on locating offices to foster innovation and growth, as their best-performing inventors suffered the greatest productivity losses when their commutes grew longer.
- 2. Shorter commutes support innovation by giving employees more time in the office and greater opportunities for in-person collaboration, while removing the physical strain of a long commute.
- 3. This is not always the case: remote work does not automatically lead to greater creativity and productivity as office water-cooler conversations are also very important for innovation.

4. Some see the link between long commutes and productivity as support for work- from-home scenarios, as many workers have grown accustomed to their commute- free arrangements during the pandemic.

22. DIRECTIONS for the question: There is a sentence that is missing in the paragraph below. Look at the paragraph and decide in which blank (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: Having made citizens more and less knowledgeable than their predecessors, the Internet has proved to be both a blessing and a curse.

Paragraph: Never before has a population, nearly all of whom has enjoyed at a least a secondary school education, been exposed to so much information, whether in newspapers and magazines or through YouTube, Google, and Facebook. ____ (1) _____. Yet it is not clear that people today are more knowledgeable than their barely literate predecessors. Contemporary advances in technology offered more serious and inquisitive students access to realms of knowledge previously unimaginable and unavailable. ____ (2) _____. But such readily available knowledge leads many more students away from serious study, the reading of actual texts, and toward an inability to write effectively and grammatically. ____ (3) _____. It has let people choose sources that reinforce their opinions rather than encouraging them to question inherited beliefs. ____ (4) _____.

A. Option 1 B. Option 2 C. Option 3 D. Option 4

23. DIRECTIONS for the question: The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

It's not that modern historians of medieval Africa have been ignorant about contacts between Ethiopia and Europe; they just had the power dynamic reversed. The traditional narrative stressed Ethiopia as weak and in trouble in the face of aggression from external forces, so Ethiopia sought military assistance from their fellow Christians to the north. But the real story, buried in plain sight in medieval diplomatic texts, simply had not yet been put together by modern scholars. Recent research pushes scholars of medieval Europe to imagine a much more richly connected medieval world: at the beginning of the so-called Age of Exploration, there is evidence that the kings of Ethiopia were sponsoring their own missions of diplomacy, faith and commerce.

- A. Historians were under the illusion that Ethiopia needed military protection from their neighbours, but in fact the country had close commercial and religious connections with them.
- B. Medieval historical sources selectively promoted the narrative that powerful European forces were called on to protect weak African civilisations such as Ethiopia, but this is far from reality.
- C. Medieval texts have documented how strong connections between the Christian communities of Ethiopia and Europe were invaluable in establishing military and trade links between the two civilisations.
- D. Medieval texts have been 'cherry-picked' to promote a view of Ethiopia as weak and in need of Europe's military help with aggressive neighbours, but recent studies reveal it was a well-connected and outward-looking culture.

24. DIRECTIONS for the question: There is a sentence that is missing in the paragraph below. Look at the paragraph and decide in which blank (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: Easing the anxiety and pressure of having a “big day” is part of the appeal for many couples who marry in secret.

Paragraph: Wedding season is upon us and – after two years of Covid chaos that saw nuptials scaled back– you may think the temptation would be to go all out. ____ (1) _____. But instead of expanding the guest list, many couples are opting to have entirely secret ceremonies. With Covid case numbers remaining high and the cost-of-living crisis meaning that many couples are feeling the pinch, it’s no wonder that some are less than eager to send out invites. ____ (2) _____. Plus, it can’t hurt that in celebrity circles getting married in secret is all the rage. ____ (3) _____. “I would definitely say that secret weddings are becoming more common,” says Landis Bejar, the founder of a therapy practice, which specialises in helping brides and grooms manage wedding stress. “People are looking for ways to get out of the spotlight and avoid the pomp and circumstance of weddings. ____ (4) _____. They just want to get to the part where they are married.”

A. Option 1

B. Option 2

C. Option 3

D. Option 4



CAT 2022 SLOT 1 DILR

DIRECTIONS for the questions 1 - 5: Read the information given below and answer the question that follows.

The management of a university hockey team was evaluating performance of four women players - Amla, Bimla, Harita and Sarita for their possible selection in the university team for next year. For this purpose, the management was looking at the number of goals scored by them in the past 8 matches, numbered 1 through 8. The four players together had scored a total of 12 goals in these matches. In the 8 matches, each of them had scored at least one goal. No two players had scored the same total number of goals.

The following facts are known about the goals scored by these four players only. All the questions refer only to the goals scored by these four players.

1. Only one goal was scored in every even numbered match.
2. Harita scored more goals than Bimla.
3. The highest goal scorer scored goals in exactly 3 matches including Match 4 and Match 8.
4. Bimla scored a goal in Match 1 and one each in three other consecutive matches.
5. An equal number of goals were scored in Match 3 and Match 7, which was different from the number of goals scored in either Match 1 or Match 5.
6. The match in which the highest number of goals was scored was unique and it was not Match 5.

1. How many goals were scored in Match 7?

- A. 1 B. 2 C. 3 D. Cannot be determined

2. Which of the following is the correct sequence of goals scored in matches 1, 3, 5 and 7?

- A. 3, 1, 2, 1 B. 5, 1, 0, 1 C. 3, 2, 1, 2 D. 4, 1, 2, 1

3. Which of the following statement(s) is/are true?

Statement-1: Amla and Sarita never scored goals in the same match.

Statement-2: Harita and Sarita never scored goals in the same match.

- A. None of the statements
B. Statement 1 only
C. Both the statements
D. Statement 2 only

4. Which of the following statement(s) is/are false?

Statement-1: In every match at least one player scored a goal.

Statement-2: No two players scored goals in the same number of matches.

- A. Statement 2 only
B. None of the statements
C. Both the statements
D. Statement 1 only

5. If Harita scored goals in one more match as compared to Sarita, which of the following statement(s) is/are necessarily true?

Statement-1: Amla scored goals in consecutive matches.

Statement-2: Sarita scored goals in consecutive matches.

- A. Both the statements
- B. Statement 2 only
- C. None of the statements
- D. Statement 1 only

DIRECTIONS for the questions 6 - 10: Read the information given below and answer the question that follows.

Adhara, Bithi, Chhaya, Dhanavi, Esther, and Fathima are the interviewers in a process that awards funding for new initiatives. Every interviewer individually interviews each of the candidates individually and awards a token only if she recommends funding. A token has a face value of 2, 3, 5, 7, 11, or 13. Each interviewer awards tokens of a single face value only.

Once all six interviews are over for a candidate, the candidate receives a funding that is Rs.1000 times the product of the face values of all the tokens. For example, if a candidate has tokens with face values 2, 5, and 7, then they get a funding of $\text{Rs.}1000 \times (2 \times 5 \times 7) = \text{Rs. } 70,000$.

Pragnyaa, Qahira, Rasheeda, Smera, and Tantra were five candidates who received funding. The funds they received, in descending order, were Rs.390,000, Rs.210,000, Rs.165,000, Rs.77,000, and Rs.66,000.

The following additional facts are known:

1. Fathima awarded tokens to everyone except Qahira, while Adhara awarded tokens to no one except Pragnyaa.
2. Rashida received the highest number of tokens that anyone received, but she did not receive one from Esther.
3. Bithi awarded a token to Smera but not to Qahira, while Dhanavi awarded a token to Qahira but not to Smera.

6. How many tokens did Qahira receive?
7. Who among the following definitely received a token from Bithi but not from Dhanavi?
A. Rasheeda B. Pragnyaa C. Tantra D. Qahira
8. How many tokens did Chhaya award?
9. How many tokens did Smera receive?
10. Which of the following could be the amount of funding that Tantra received?
(a) Rs. 66,000 (b) Rs. 165,000
A. Only (b) B. Only (a) C. Neither (a) nor (b) D. Both (a) and (b)

DIRECTIONS for the questions 11 - 15: Read the information given below and answer the question that follows.

There are 15 girls and some boys among the graduating students in a class. They are planning a get-together, which can be either a 1-day event, or a 2-day event, or a 3-day event. There are 6 singers in the class, 4 of them are boys. There are 10 dancers in the class, 4 of them are girls. No dancer in the class is a singer.

Some students are not interested in attending the get-together. Those students who are interested in attending a 3-day event are also interested in attending a 2-day event; those who are interested in attending a 2-day event are also interested in attending a 1-day event.

The following facts are also known:

1. All the girls and 80% of the boys are interested in attending a 1-day event. 60% of the boys are interested in attending a 2-day event.
2. Some of the girls are interested in attending a 1-day event, but not a 2-day event; some of the other girls are interested in attending both.
3. 70% of the boys who are interested in attending a 2-day event are neither singers nor dancers. 60% of the girls who are interested in attending a 2-day event are neither singers nor dancers.
4. No girl is interested in attending a 3-day event. All male singers and 2 of the dancers are interested in attending a 3-day event.
5. The number of singers interested in attending a 2-day event is one more than the number of dancers interested in attending a 2-day event.

11. How many boys are there in the class?

12. Which of the following can be determined from the given information?

- I. The number of boys who are interested in attending a 1-day event and are neither dancers nor singers.
- II. The number of female dancers who are interested in attending a 1-day event.

- A. Neither I nor II B. Both I and II C. Only I D. Only II

13. What fraction of the class are interested in attending a 2-day event?

- A. $\frac{7}{13}$ B. $\frac{2}{3}$ C. $\frac{9}{13}$ D. $\frac{7}{10}$

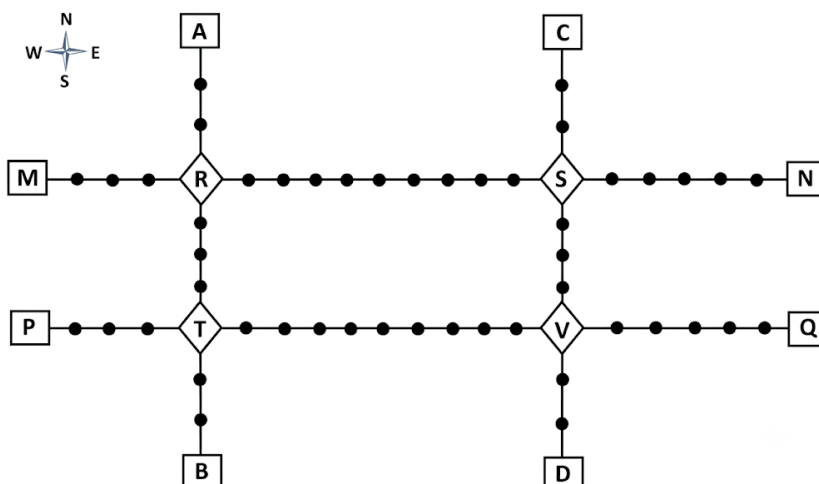
14. What BEST can be concluded about the number of male dancers who are interested in attending a 1-day event?

- A. 5 B. 4 or 6 C. 6 D. 5 or 6

15. How many female dancers are interested in attending a 2-day event?

- A. 2 B. 1 C. 0 D. Cannot be determined

DIRECTIONS for the questions 16 - 20: Read the information given below and answer the question that follows.



Given above is the schematic map of the metro lines in a city with rectangles denoting terminal stations (e.g. A), diamonds denoting junction stations (e.g. R) and small filled-up circles denoting other stations. Each train runs either in east-west or north-south direction, but not both. All trains stop for 2 minutes at each of the junction stations on the way and for 1 minute at each of the other stations. It takes 2 minutes to reach the next station for trains going in east-west direction and 3 minutes to reach the next station for trains going in north-south direction. From each terminal station, the first train starts at 6 am; the last trains leave the terminal stations at midnight. Otherwise, during the service hours, there are metro service every 15 minutes in the north-south lines and every 10 minutes in the east-west lines. A train must rest for at least 15 minutes after completing a trip at the terminal station, before it can undertake the next trip in the reverse direction. (All questions are related to this metro service only. Assume that if someone reaches a station exactly at the time a train is supposed to leave, (s)he can catch that train.)

16. If Hari is ready to board a train at 8:05 am from station M, then when is the earliest that he can reach station N?
 A. 9:06 am B. 9:13 am C. 9:11 am D. 9:01 am
17. If Priya is ready to board a train at 10:25 am from station T, then when is the earliest that she can reach station S?
 A. 11:12 am B. 11:28 am C. 11:22 am D. 11:07 am
18. Haripriya is expected to reach station S late. What is the latest time by which she must be ready to board at station S if she must reach station B before 1 am via station R?
 A. 11:39 pm B. 11:43 pm C. 11:49 am D. 11:35 pm
19. What is the minimum number of trains that are required to provide the service on the AB line (considering both north and south directions)?
20. What is the minimum number of trains that are required to provide the service in this city?

CAT 2022 SLOT 1 QUANT

1. Let A be the largest positive integer that divides all the numbers of the form $3^k + 4^k + 5^k$, and B be the largest positive integer that divides all the numbers of the form $4^k + 3(4^k) + 4^{k+2}$, where k is any positive integer. Then (A + B) equals
2. For natural numbers x, y and z, if $xy + yz = 19$ and $yz + xz = 51$, then the minimum possible value of xyz is
3. Alex invested his savings in two parts. The simple interest earned on the first part at 15% per annum for 4 years is the same as the simple interest earned on the second part at 12% per annum for 3 years. Then, the percentage of his savings invested in the first part is
 A. 62.5% B. 40% C. 60% D. 37.5%
4. Let a and b be natural number. If $a^2 + ab + a = 14$ and $b^2 + ab + b = 28$, then (2a + b) equals
5. In a class of 100 students, 73 like coffee, 80 like tea and 52 like lemonade. It may be possible that some students do not like any of these three drinks. Then the difference between the maximum and minimum possible number of students who like all the three drinks is
 A. 48 B. 52 C. 47 D. 53
6. A mixture contains lemon juice and sugar syrup in equal proportion. If a new mixture is created by adding this mixture and sugar syrup in the ratio 1: 3, then the ratio of lemon juice and sugar syrup in the new mixture is
 A. 1: 4 B. 1: 5 C. 1: 6 D. 1: 7
7. Let a, b, c be non-zero real numbers such that $b^2 < 4ac$, and $f(x) = ax^2 + bx + c$. If the set S consists of all integers m such that $f(m) < 0$, then the set S must necessarily be
 A. the empty set
 B. either the empty set or the set of all integers
 C. the set of all integers
 D. the set of all positive integers
8. Amal buys 110 kg of syrup and 120 kg of juice, syrup being 20% less costly than juice, per kg. He sells 10 kg of syrup at 10% profit and 20 kg of juice at 20% profit. Mixing the remaining juice and syrup, Amal sells the mixture at Rs. 308.32 per kg and makes an overall profit of 64%. Then, Amal's cost price for syrup, in rupees per kg, is
9. In a village, the ratio of number of males to females is 5: 4. The ratio of number of literate males to literate females is 2: 3. The ratio of the number of illiterate males to illiterate females is 4: 3. If 3600 males in the village are literate, then the total number of females in the village is
10. All the vertices of a rectangle lie on a circle of radius R. If the perimeter of the rectangle is P, then the area of the rectangle is
 A. $\frac{P^2}{2} - 2PR$ B. $\frac{P^2}{16} - R^2$ C. $\frac{P^2}{8} - 2R^2$ D. $\frac{P^2}{8} - \frac{R^2}{2}$

11. Let ABCD be a parallelogram such that the coordinates of its three vertices A, B, C are (1, 1), (3, 4) and (-2, 8), respectively. Then, the coordinates of the vertex D are
 A. (0, 11) B. (-3, 4) C. (4, 5) D. (-4, 5)
12. The largest real value of a for which the equation $|x + a| + |x - 1| = 2$ has an infinite number of solutions for x is
 A. -1 B. 0 C. 1 D. 2
13. The number of ways of distributing 20 identical balloons among 4 children such that each child gets some balloons but no child gets an odd number of balloons, is
14. For any natural number n, suppose the sum of the first n terms of an arithmetic progression is $(n + 2n^2)$. If the n^{th} term of the progression is divisible by 9, then the smallest possible value of n is
 A. 4 B. 7 C. 8 D. 9
15. A trapezium ABCD has side AD parallel to BC, $\angle BAD = 90^\circ$, BC = 3cm and AD = 8cm. If the perimeter of this trapezium is 36cm, then its area, in sq. cm, is
16. Let $0 \leq a \leq x \leq 100$ and $f(x) = |x - a| + |x - 100| + |x - a - 50|$. Then the maximum value of $f(x)$ becomes 100 when a is equal to
 A. 50 B. 25 C. 100 D. 0
17. The average of three integers is 13. When a natural number n is included, the average of these four integers remains an odd integer. The minimum possible value of n is
 A. 3 B. 5 C. 4 D. 1
18. For any real number x, let $[x]$ be the largest integer less than or equal to x. If $\sum_{n=1}^N \left[\frac{1}{5} + \frac{n}{25} \right] = 25$, then N is
19. Ankita buys 4 kg cashews, 14 kg peanuts and 6 kg almonds when the cost of 7 kg cashews is the same as that of 30 kg peanuts or 9 kg almonds. She mixes all the three nuts and marks a price for the mixture in order to make a profit of Rs.1752. She sells 4 kg of the mixture at this marked price and the remaining at a 20% discount on the marked price, thus making a total profit of Rs. 744. Then the amount, in rupees, that she had spent in buying almonds is
 A. 1176 B. 1680 C. 2520 D. 1440
20. The average weight of students in a class increases by 600 gm when some new students join the class. If the average weight of the new students is 3 kg more than the average weight of the original students, then the ratio of the number of original students to the number of new students is
 A. 1: 4 B. 1: 2 C. 4: 1 D. 3: 1
21. Pinky is standing in a queue at a ticket counter. Suppose the ratio of the number of persons standing ahead of Pinky to the number of persons standing behind her in the queue is 3: 5. If the total number of persons in the queue is less than 300, then the maximum possible number of persons standing ahead of Pinky is

22. Trains A and B start traveling at the same time towards each other with constant speeds from stations X and Y, respectively. Train A reaches station Y in 10 minutes while train B takes 9 minutes to reach station X after meeting train A. Then the total time taken, in minutes, by train B to travel from station Y to station X is

A. 12

B. 10

C. 6

D. 15



CAT 2022 SLOT 1 Solutions

VARC

1. Correct Answer: A

This question tests your ability to identify the central idea of a paragraph. When a question asks for the main argument, the focus should be on the overall purpose of the paragraph rather than on individual examples or supporting details.

The fourth paragraph argues that technologies, laws, and customs can all be viewed as institutions that shape human behaviour and represent particular human interests. The author states that technologies, like laws and customs, privilege certain dimensions of human nature. The examples of property laws, parental authority, and automobiles are used to illustrate this common characteristic.

Option A is correct because it captures the central comparison being made throughout the paragraph. The author's primary objective is to show that technology, laws, and customs function similarly when regarded as institutions.

Option B is incorrect because it focuses only on technology's role in privileging certain dimensions of human nature. While this idea is present, it does not capture the broader comparison that forms the main argument.

Option C is incorrect because the paragraph emphasizes similarities rather than differences. The author does not discuss these institutions as fundamentally dissimilar.

Option D is incorrect because it refers to a specific example used to support the broader argument. The mention of automobiles representing mobility is illustrative, not the central idea.

Hence, Option A best reflects the main argument of the fourth paragraph.

2. Correct Answer: C

This is an EXCEPT question, which means we need to identify the option that cannot be reasonably inferred from the passage. For such questions, it is important to distinguish between what the author explicitly states or strongly implies and what goes beyond the scope of the passage.

Option A can be inferred. The passage clearly rejects the idea of an eternal or fixed human nature. The author explains that the dimensions of human nature recognized by society emerge within historical contexts. Therefore, even though parental authority represents children's interests in safety and growth, this does not imply that parental authority is a permanent or timeless aspect of human nature.

Option B can also be inferred. The passage states that a hermeneutics of technology must uncover the meanings embedded in technological devices and practices. It further notes that social histories of technologies such as bicycles, artificial lighting, and firearms have made important contributions to such analysis. Therefore, studying the social history of technologies is presented as an important way of revealing their implicit and explicit meanings.

Option C cannot be inferred and is therefore the correct answer. While the passage states that technologies privilege certain dimensions of human nature and shape their inhabitants, it never claims that they do so "at a high cost to lived nature." The discussion of lived nature in the final paragraph concerns the limits of society's ability to control and impose meanings, but the author does not establish a direct trade-off whereby technological representation necessarily harms or diminishes lived nature. This additional claim is introduced by the option and is not supported by the passage.

Option D can be inferred. In the opening paragraph, the author explains that as formal claims of human rights advance, increasingly powerful public institutions and private organizations simultaneously impose an authoritarian social order. This indicates that the growing prominence of human rights is accompanied by increasing centralization of power, which is precisely the relationship suggested in the option.

Hence, Option C is the only statement that cannot be inferred from the passage.

3. Correct Answer: A

This question asks us to identify the statement that supports the author's overall argument. To answer such questions, it is important to first understand the central theme of the passage. The author argues that technology is not merely a collection of tools but an environment that shapes human life, social relations, and the dimensions of human nature recognized by society. Technologies, like laws and customs, influence and structure the way people live and interact.

Option A is correct because it directly reflects this central argument. The passage repeatedly emphasizes that technologies function as environments that shape their inhabitants. By stating that technologies form the environmental context and shape the contours of human society, this option effectively restates the author's core position in simpler terms.

Option B is incorrect because it misrepresents the discussion in the final paragraph. The author refers to a more romantic conception of nature but immediately suggests that we may adopt a less romantic conception in which the dimensions of human nature recognized by society are also granted theoretical legitimacy. Therefore, the passage does not argue that the romantic conception alone requires theoretical legitimacy.

Option C is incorrect because it attributes an active role to nature that the passage does not support. The author states that nature exists at the limit of history, at the point where society loses the capacity to impose meanings and exercise control. However, nature does not "decide" this point. The option introduces an idea of agency that is absent from the passage.

Option D is incorrect because it directly contradicts the fourth paragraph. The author explicitly states that laws, customs, and technologies represent certain dimensions of human nature. For example, property laws represent interests in ownership and control, while parental authority represents interests in safety and growth. Thus, these institutions are linked to human nature rather than being representations of culture alone.

Hence, Option A is the statement that most clearly supports the arguments presented in the passage.

4. Correct Answer: C

The passage says the trajectory arose from problems of command over a disempowered and deskilled labor force, and that this same pattern prevails everywhere masses are organized, giving Foucault's prisons and Habermas's public sphere as examples where this pattern also shows up. So prisons and the public sphere are instances where the pattern appears, not the source of the pattern itself.

Option C flips this relationship. It says masses are organized in patterns set by Foucault's prisons and Habermas's public sphere, which implies these two are the origin points dictating how masses get organized elsewhere. That's the opposite of what the passage argues, since the passage traces the pattern back to capitalist rationalization of production, with prisons and the public sphere merely being places where the same pattern is also visible. This reversal of cause and example is what makes C contradict the passage.

5. Correct Answer: A

This is an inference-based question in which we need to identify the statement that is supported by the information given in the passage. The key is to choose the option that follows logically from the author's discussion without introducing assumptions that are not mentioned in the text.

Option A is correct. In the final paragraph, the author states that the Stoic idea of developing virtue and becoming a good person laid the foundation for the three monotheistic religions—Judaism, Christianity, and Islam. This clearly indicates that Stoic thought influenced multiple religions. Therefore, this statement can be regarded as true on the basis of the passage.

Option B is incorrect because it is the exact opposite of what the passage says. The Stoics believed that people should free themselves from excessive desires for money, power, and sexual gratification. They regarded character, rationality, and kindness as truly important. Hence, the Stoics did not valorise these pursuits; they cautioned against them.

Option C is incorrect because the passage does not provide any information about whether Stoics existed or did not exist in India during the Roman era. The mention of Buddha living in India and the comparison between Buddhism and Stoicism does not allow us to draw any conclusion about the geographical presence or absence of Stoics in India. Therefore, this statement cannot be inferred.

Option D is incorrect because the passage does not state that the Epicureans believed in controlling all emotions. Instead, they advocated enjoying simple pleasures such as friendship, conversation, food, and wine while avoiding excessive attachment to things like money and power. Their philosophy was based on moderation, not on suppressing every emotion.

Hence, Option A is the only statement that can be regarded as true on the basis of the passage.

6. Correct Answer: B

This question tests your ability to distinguish between facts that can be reasonably inferred from an example and details that are merely hypothetical or unsupported. While reading examples in RC passages, it is important to separate what the author assumes for illustration from what can actually be concluded from the information provided.

Option B is correct. In the example, the author imagines a situation in which an army general accuses Marcus Aurelius of treason in front of other officers. The passage also mentions that one possible response for Marcus would have been to continue leading the Romans in the way he believed best benefited them. From this, we can safely infer that Marcus Aurelius occupied a leadership position within the Roman military or state structure. Therefore, it is reasonable to conclude that he was one of the leaders of the Roman army.

Option A is incorrect because plotting revenge is presented merely as one possible second movement that Marcus could have chosen. The passage does not state that he actually sought revenge. Therefore, this cannot be inferred.

Option C is incorrect because the passage mentions that Marcus might have experienced surprise and anger as an initial emotional response. However, it never states that he was humiliated. Introducing humiliation goes beyond the information provided and is therefore unsupported.

Option D is incorrect because although Marcus Aurelius is often associated with Stoicism outside the passage, the question asks for an inference based on the example given in the text. The example does not explicitly establish that Marcus was a Stoic or that his philosophy survived into the Roman era. This information cannot be derived from the example itself.

Hence, Option B is the only accurate inference that can be drawn from the example of Marcus Aurelius given in the passage.

7. Correct Answer: D

This is a NOT-possible-implication question. In such questions, the objective is to identify the option that goes beyond what the passage states or reasonably suggests. We must be careful not to import ideas that are not supported by the text, even if they seem plausible from our general knowledge.

The quoted statement explains the Buddhist approach to emotions. According to the passage, emotions are inevitable and cannot be prevented. However, through meditation and the right attitude, a person can observe emotions without immediately acting on them. This creates a degree of distance from emotional impulses, enabling one to judge what truly has value and respond more thoughtfully.

Option D is correct because it cannot be inferred from the quoted statement. The passage speaks of achieving "distance" from one's emotions, but this distance is psychological or reflective in nature. There is no mention of meditation producing literal out-of-body experiences. The option introduces an idea that is completely absent from the passage and therefore cannot be regarded as an implication.

Option A can be inferred. The statement suggests that emotions should be allowed to occur naturally and be observed without immediate reaction. This indicates an initially passive reception of experiences, where one first allows emotions to arise before deciding how to respond.

Option B can be inferred. Earlier in the passage, the Stoics distinguish between the first movement, which is the automatic emotional reaction, and the second movement, which involves the conscious response that follows. Observing emotions from a distance and deciding whether or not to act on them corresponds closely to this controlled second movement.

Option C can also be inferred. The quoted statement emphasizes that by creating distance from emotions, one can better determine what has value and what does not. This suggests that unchecked emotional reactions may interfere with such judgment, making it harder to distinguish valuable experiences from valueless ones.

Hence, Option D is the only statement that is not a possible implication of the quoted passage because it introduces the unsupported idea of out-of-body experiences.

8. Correct Answer: A

This is a slightly tricky question because of its double-negative construction. The question asks us to identify a statement which, if proven false, would contradict the facts or arguments presented in the passage. In simpler terms, we need to find the statement that is actually supported by the passage. If such a statement were false, the passage itself would be undermined.

Option A is correct because it is directly supported by the passage. The Epicureans believed that people should enjoy simple pleasures such as friendship, conversation, food, and wine, but should not be indulgent in these pursuits. In other words, excessive indulgence in simple pleasures is not desirable from the Epicurean perspective. Therefore, if this statement were false, it would directly contradict the passage's description of Epicurean philosophy.

Option B is incorrect because it misrepresents the Stoic theory of emotions. The Stoics distinguish between the first movement, which is the automatic emotional reaction, and the second movement, which is the conscious response that follows. The passage argues that the reasoned and unemotional

response should occur at the level of the second movement, not the first. Since the statement itself is not supported by the passage, its falsity would not create any contradiction.

Option C is incorrect because it confuses Zeno with Stoicism. The passage states that Stoicism survived into the Roman era until about AD 300, not that Zeno himself survived until then. Since the statement is factually inconsistent with the passage, making it false would not contradict anything in the text.

Option D is incorrect because the passage does not claim that emotions can never be controlled. In fact, both Stoicism and Buddhism are presented as philosophies that encourage managing emotional responses through reason, meditation, and the cultivation of the right attitude. Therefore, this statement is not supported by the passage in the first place.

Hence, Option A is the statement whose falsity would contradict the facts and arguments presented in the passage.

9. Correct Answer: A

This question asks us to interpret the meaning of a specific statement from the passage. The key phrase is "many of the Undead were often accorded attributes, which defied the natural order of things." Here, the author is explaining how human beings imagined and described the Undead. To emphasize their abnormal and frightening nature, people attributed supernatural powers to them, such as shape-shifting, drinking human blood, and influencing minds from a distance.

Option A is correct because it accurately captures this idea. The passage suggests that humans conceptualised the Undead as beings possessing abnormal and supernatural characteristics. These features were not presented as objectively real but as qualities that people associated with the Undead in order to distinguish them from ordinary beings.

Option B is incorrect because the passage does not suggest that the Undead originally possessed natural attributes that later became abnormal. Rather, people attributed abnormal characteristics to them from the outset in order to highlight their supernatural nature.

Option C is incorrect because the author does not discuss the deification of the Undead. Although some early Undead figures may have been linked to primitive deities, the statement in question is specifically about supernatural attributes that violated natural laws, not about granting divine status.

Option D is incorrect because it misinterprets the relationship between abnormal status and the natural order. The passage does not claim that assigning an abnormal status to the Undead amounts to rejecting the natural order. Instead, it states that people imagined the Undead as possessing powers that defied the natural order, thereby reinforcing their abnormal status.

Hence, Option A best expresses the author's claim that human beings perceived and described the Undead as possessing abnormal and supernatural features.

10. Correct Answer: B

This is a logically tricky question because of the double-negative structure. The question asks for the statement which, if false, would not be in accordance with the passage. In simpler terms, we need to identify the option that is actually supported by the passage. If that supported statement were made false, it would contradict the passage. The word "EXCEPT" signals that this is the odd one out.

Option B is correct because it is directly supported by the passage. The final paragraph states that "from the Middle Ages and into the Age of Enlightenment, theories of the Undead continued to grow

and develop." This clearly implies that new ideas and theories about the Undead emerged during this period. Therefore, if Option B were false, it would contradict the passage. Since the question asks for the exception, Option B is the answer.

Option A is not supported by the passage. In fact, the passage explicitly states that the relationship between a magician and an Undead creature was often "very tenuous and uncertain." Therefore, the claim that the relationship was strong and stable goes against the passage. If this statement were false, it would actually become consistent with the author's argument.

Option C is not supported by the passage either. The author explains that as human societies became more sophisticated, the Undead did not disappear from human belief systems. Instead, they continued to exist in folklore and gradually acquired more definite forms. Therefore, if this statement were false, it would align with the passage.

Option D is also contrary to the passage. The author states that as humans attempted to explain the horror associated with the Undead, these creatures emerged more clearly into the light and took on more definite shapes. Thus, the claim that they remained vague and ill-defined contradicts the text. If this statement were false, it would be consistent with the passage.

Hence, Option B is the exception because it is the only statement that is actually supported by the passage and would contradict it if made false.

11. Correct Answer: C

This question tests your ability to interpret a descriptive statement and identify the conclusion that follows most accurately from it. The quoted line describes the earliest human beliefs about mysterious beings that seemed to exist in a state between life and death. The focus is not on the actual existence of such creatures but on humanity's belief in them and the fear they inspired.

Option C is correct because it faithfully captures the meaning of the statement. The passage suggests that from the earliest years of human history, people believed in eerie creatures that were neither fully alive nor fully dead. This idea forms the basis of later stories about the Undead. Thus, Option C accurately summarizes the conclusion that can be drawn from the quoted line.

Option A is incorrect because it misinterprets the phrase "come whispers of eerie creatures." The passage does not suggest that the creatures themselves were whispering. Rather, "whispers" refers metaphorically to stories, rumours, or beliefs about such creatures circulating among early humans.

Option B is incorrect because it implies that these creatures were actually seen only in darkness and were alive with eerie whispers. The passage does not make such a claim. It discusses human beliefs and fears, not verified sightings or characteristics of real creatures.

Option D is incorrect because the passage explicitly states that these creatures were "not quite alive (or alive in a way which we can understand)." This indicates uncertainty and mystery, not understanding. The statement gives us no basis for claiming that we can understand their lives through their whispers.

Hence, Option C is the most valid conclusion because it accurately reflects the passage's description of early human belief in creatures that existed in an ambiguous state between life and death.

12. Correct Answer: D

This is a primary purpose question, which requires us to identify the central theme of the entire passage. To answer such questions, we must focus on the broad idea that connects all the paragraphs rather than on any single detail or example.

The passage traces the development of beliefs about the Undead across different stages of human history. It begins with the vague and mysterious fears of early humans, and then explains how these creatures gradually acquired more definite forms and supernatural attributes as societies became more sophisticated. The passage further discusses their association with magic and sorcery before concluding with the continued evolution of theories about werewolves, vampires, and ghouls from the middle Ages into the Age of Enlightenment. Thus, the passage is fundamentally about how ideas concerning the Undead evolved over time.

Option D is correct because it captures this overall progression. The author is concerned with the historical evolution of theories and beliefs about the Undead, from primitive human societies to more developed civilizations and intellectual periods.

Option A is incorrect because the association between the Undead and Shamans or magic is only one part of the discussion. While the passage does address this connection, it does not constitute the main focus of the entire passage.

Option B is incorrect because the passage is not primarily about the transition from primitive thinking to the Age of Enlightenment. That historical transition serves merely as the backdrop against which beliefs about the Undead evolved.

Option C is incorrect because the passage does not focus on humanity's inability to understand its environment. Rather, it explains how humans attempted to understand and explain their fears by creating increasingly elaborate theories about the Undead.

Hence, Option D best describes the passage as a whole because it accurately reflects the author's discussion of the evolution of theories of the Undead from primitive beliefs to the Age of Enlightenment.

13. Correct Answer: D

This is an application-of-arguments question. We need to identify the scenario that is least likely to follow from the ideas presented in the passage. The central argument of the passage is that Eastern and Western cultures have historically differed in their understanding of originality, copies, restoration, and reproduction. While many Eastern traditions place equal value on faithful reproductions, the modern west places special importance on preserving the original.

Option A is likely to follow from the passage. The example of the Ise Grand Shrine shows that despite being rebuilt every twenty years, it is still regarded by Japanese pilgrims as the same 1,300-year-old shrine. This reflects the Far Eastern view that faithful reproduction preserves identity. Therefore, a Japanese Buddhist monk valuing a reconstructed shrine as the original is entirely consistent with the passage.

Option B is also likely to follow. The passage explicitly states that many Christians opposed human cloning, whereas the Buddhist researcher Hwang Woo-suk justified cloning through Buddhist ideas of reincarnation. Therefore, a Christian scientist opposing cloning because of his philosophical or religious orientation fits well with the author's argument.

Option C is likely to follow as well. The passage explains that in the 17th-century West, artworks from antiquity were not restored with strict fidelity to the original. Instead, restorers often made substantial changes and interventions. Therefore, a 17th-century British painter adding personal touches while restoring an ancient Roman painting would be consistent with the practices described.

Option D is the correct answer because it is unlikely to follow from the passage. The passage specifically states that 17th-century restorers in the West did not feel compelled to remain completely faithful to the original work. More importantly, the passage does not suggest that a Christian worldview required strict adherence to the original intent of a painting. This connection between Christianity and restoration practices is introduced by the option itself and is not supported by the text. Hence, Option D is the scenario least likely to follow from the arguments presented in the passage.

14. Correct Answer: D

This is an EXCEPT question. We need to identify the option that is not a consequence of the modern Western belief in the importance of an "unassailable original." Throughout the passage, the author contrasts the Western emphasis on preserving originals with the East Asian tendency to treat faithful reproductions as equally valuable. The correct answer will be the option that does not arise from this Western attitude.

Option A can be inferred from the passage. Since the modern West places a unique value on the original artwork, copies are not considered equivalent to it. As a result, displaying multiple copies of a painting would not carry the same significance as displaying the original. Therefore, this can reasonably be seen as a consequence of the Western emphasis on originality.

Option B can also be inferred. The passage notes that while 17th-century Europeans freely altered ancient artworks, modern Western attitudes have shifted toward preserving the original as faithfully as possible. A strong commitment to the sanctity of the original naturally discourages extensive intervention or alteration.

Option C is supported by the example of Freiburg Minster. The cathedral requires continuous restoration work, with damaged stones being carefully examined and replaced by newly crafted replicas. This ongoing effort to preserve the original structure creates regular employment for skilled craftsmen. Thus, this is a consequence of valuing the original.

Option D is the correct answer because it does not directly result from the Western concept of an "unassailable original." Although the passage mentions that many Christians opposed human cloning, this opposition is linked to religious and philosophical beliefs rather than to attitudes about preserving original artworks or artefacts. The passage does not establish a direct connection between the Western reverence for artistic originals and opposition to cloning.

Hence, Option D is the exception because it is not a direct consequence of the modern Western value assigned to an "unassailable original."

15. Correct Answer: C

This question is based on the distinction the passage makes between two Chinese concepts of a copy. The key idea is that a fangzhipin is an imitation whose difference from the original is obvious, whereas a fuzhipin is an exact reproduction that is regarded as having the same value as the original. Therefore, we need to identify the option that most closely resembles a perfect, indistinguishable reproduction.

Option C is correct because it describes a painting that is identical to Vincent van Gogh's original in every respect. This matches the passage's definition of a fuzhipin—an exact reproduction that the Chinese would consider equal in value to the original. Since there is no detectable difference between the copy and the original, a Chinese museum would be unlikely to regard it as having lesser value.

Option A is incorrect because a photograph of a painting, even if printed at exactly the same scale, is not the same medium as the original artwork. The difference between a painted canvas and a photographic reproduction remains obvious. Therefore, it would not qualify as an exact reproduction in the sense described in the passage.

Option B is incorrect because the copy bears Picasso's signature. This introduces a clear difference from the original painting and prevents it from being an exact replica. It would therefore be treated as distinct from the original.

Option D is incorrect because the painting is miniaturised. Even though it may be faithful and accurate in every other respect, the change in size makes it visibly different from the original. The passage explicitly distinguishes exact reproductions from scaled-down models or imitations.

Hence, Option C is the only copy that fits the Chinese concept of a fuzhipin and would therefore be unlikely to be considered less valuable than the original.

16. Correct Answer: B

This question asks us to identify the statement that does not correctly describe a similarity between the Ise Grand Shrine and the cathedral of Freiburg Minster. The passage uses these two examples to illustrate different cultural understandings of originality and preservation, while also highlighting certain common features between them.

Option B is correct because it is not a true similarity between the two structures. The cathedral of Freiburg Minster is described as being under continuous restoration, with damaged stones regularly examined and replaced. In contrast, the Ise Grand Shrine is not continually restored. Instead, it is completely rebuilt from scratch every twenty years. Since the methods of preservation are fundamentally different, this option does not represent a valid similarity.

Option A is incorrect because it does describe a similarity. The Ise Grand Shrine is periodically rebuilt in its entirety every twenty years, while the Freiburg Minster is gradually reconstructed over time through the replacement of damaged stones. The passage explicitly states that these are fundamentally the same operation, differing mainly in speed. Therefore, both can eventually be completely rebuilt.

Option C is incorrect because both structures are indeed places of worship. The Ise Grand Shrine is a Japanese shrine and Freiburg Minster is a cathedral. Thus, both serve religious purposes.

Option D is incorrect because both can be regarded as very old structures. The Japanese regard the Ise Grand Shrine as being 1,300 years old despite its periodic reconstruction, while Freiburg Minster is also an ancient religious structure whose original medieval identity is preserved despite ongoing restoration. Therefore, age and historical continuity are characteristics shared by both.

Hence, Option B is the only statement that does not correctly express a similarity between the Ise Grand Shrine and the cathedral of Freiburg Minster

17. Correct Answer: D

This is a summary question, where the objective is to identify the option that captures the central idea of the passage without distorting, exaggerating, or omitting important points. A good summary should include the passage's main argument while maintaining the author's tone and balance.

The passage highlights the democratic value of petitioning. It explains that petitions allow citizens to directly communicate issues to governments, shape political agendas, mobilize support for causes, and provide a voice to those who may otherwise remain unheard. The author then contrasts petitioning with elections, pointing out certain limitations of elections: they offer limited choices, do not directly reflect views on specific policies, and occur only periodically. The overall argument is not that elections are unimportant, but that petitioning serves as an important supplement by enabling continuous citizen engagement in democratic processes.

Option D is correct because it accurately captures this balanced argument. It recognizes both the importance of petitioning and its role in complementing the electoral process by facilitating ongoing interaction between citizens and government.

Option A is incorrect because it goes beyond the passage by suggesting that democratic functioning would improve if societies relied more on petitioning than on elections. The author never advocates replacing or prioritizing petitioning over elections; rather, petitioning is presented as a supplement to electoral democracy.

Option B is incorrect because the passage never claims that citizens are becoming less inclined to petition. This idea is completely absent from the text and is therefore an unwarranted addition.

Option C is incorrect because it overstates the author's position. The passage praises petitioning for enhancing democratic participation, but it does not describe petitions as the ideal form of representative democracy. Such an extreme conclusion is not supported by the passage.

Hence, Option D best captures the essence of the passage by presenting petitioning as a valuable democratic tool that supplements elections through continuous citizen engagement with government.

18. Correct Answer: 2431

This is a Parajumble question. The key to solving it is to identify the opening sentence, locate mandatory sentence pairs, and trace the logical flow of ideas from introduction to conclusion.

Sentence 2 is the best opening sentence because it introduces the central subject of the paragraph—collagen. Since the other sentences discuss different types and applications of collagen, the paragraph must begin with this general introduction.

Sentence 4 follows naturally after Sentence 2. The pronoun "its" in Sentence 4 refers to collagen introduced in Sentence 2. Moreover, Sentence 2 highlights collagen's role in skin regeneration, while Sentence 4 discusses a limitation associated with the use of collagen derived from pigs and cows. Thus, 2 and 4 form a logical progression from introducing collagen to discussing a problem related to its medical application.

Sentence 3 comes next because it offers a solution to the issue raised in Sentence 4. After mentioning the risks associated with pig and cow collagen proteins, Sentence 3 introduces fish skin as an alternative. The phrase "Fish skin swims in here" clearly indicates a response to the problem discussed immediately before.

Sentence 1 logically concludes the paragraph. Once fish skin has been introduced as a safer alternative in Sentence 3, Sentence 1 elaborates on its advantages by describing the excellent thermo-

stability and tensile strength of fish skin collagen and its suitability for use in bandages. Thus, Sentence 1 serves as a natural extension of the idea introduced in Sentence 3.

Therefore, the correct sequence is $2 \rightarrow 4 \rightarrow 3 \rightarrow 1$.

Hence, the correct order is 2431.

19. Correct Answer: A

This is a summary question, where the objective is to identify the option that best captures the central idea of the passage without getting distracted by specific examples or exaggerated interpretations. The passage argues that our conventional understanding of reality is limited and that distinctions we take for granted, particularly the distinction between animate and inanimate objects, break down at the level of quantum mechanics. The author uses this idea to suggest that the universe is interconnected in ways that exceed our ordinary capacity to comprehend.

Option A is correct because it captures the core argument of the passage. The discussion ultimately centres on how the distinction between animate and inanimate objects becomes untenable when viewed through the lens of quantum mechanics. This idea is the most important and distinctive point made by the author.

Option B is incorrect because it overstates the author's claim. While the passage suggests that objects we consider inanimate may be alive or responsive in ways we do not fully understand, it does not explicitly claim that they are sentient or cognizant in the same manner as living beings. The option introduces a stronger assertion than the passage supports.

Option C is incorrect because it focuses on only one supporting detail. The comparison regarding responses to stimuli is used merely to illustrate the broader argument about the inadequacy of the animate–inanimate distinction. A good summary must capture the larger point rather than a single example.

Option D is incorrect because it emphasizes our limited understanding of reality but misses the passage's central focus on the disappearance of the distinction between animate and inanimate entities at the quantum level. Moreover, the phrase "astigmatic view of reality" is an interpretation introduced by the option rather than an idea directly developed in the passage.

Hence, Option A best captures the essence of the passage by highlighting the breakdown of conventional distinctions between animate and inanimate objects in the realm of quantum mechanics.

20. Correct Answer: 3214

This is a Parajumble question. The key to solving it is to identify the opening sentence, establish mandatory sentence pairs, and then trace how the argument develops from a general observation to a logical conclusion.

Sentence 3 is the best opening sentence because it introduces the central theme of the paragraph—the growing importance of the creative industry. It presents a broad, introductory statement by noting that the creative industry is receiving significant attention due to its growth rate exceeding that of the world economy. Since the remaining sentences elaborate on this idea, Sentence 3 naturally serves as the starting point.

Sentence 2 follows Sentence 3. The phrase "In fact" indicates that Sentence 2 is providing additional support or elaboration for a point already made. After Sentence 3 highlights the rapid growth of the creative industry, Sentence 2 strengthens the argument by suggesting that the industry's contribution

would appear even larger if creative inputs from other sectors were also included. Thus, 3 and 2 form a strong logical pair.

Sentence 1 comes next. Having established the growing significance of the creative industry, the paragraph moves to explain why creativity matters in practical business terms. Sentence 1 states that creativity in product design has become crucial because it helps firms maintain a competitive advantage. This idea develops naturally from the broader discussion in Sentences 3 and 2.

Sentence 4 is the ideal concluding sentence. The phrase "It is for this reason" clearly refers back to the growing economic importance of creativity discussed in the previous sentences. The sentence draws the final implication of the argument by explaining why intellectual property has become a major issue in international trade. Since it presents a consequence of the preceding discussion, it logically concludes the paragraph.

Therefore, the correct sequence is $3 \rightarrow 2 \rightarrow 1 \rightarrow 4$.

Hence, the correct order is 3214.

21. Correct Answer: 2143

This is a Parajumble question. To arrive at the correct sequence, we need to identify the opening sentence, establish logical sentence pairs, and track how the argument progresses.

Sentence 2 is the best opening sentence because it introduces the central idea that shorter commutes support innovation and productivity. It presents a general claim and explains the benefits of reduced commuting, making it a suitable starting point for the paragraph.

Sentence 1 follows naturally. It provides evidence for the claim made in Sentence 2 by describing how some company leaders are making office-location decisions based on research showing that longer commutes negatively affect the productivity of their best inventors. Thus, Sentence 1 serves as a practical illustration of the point introduced in Sentence 2.

Sentence 4 comes next. The phrase "Some see the link" refers back to the connection between commuting and productivity discussed in the previous sentences. Based on this link, some people argue in favour of work-from-home arrangements because they eliminate commuting altogether. Therefore, Sentence 4 logically extends the discussion.

Sentence 3 must follow Sentence 4 because it begins with the phrase "This is not always the case." The word "This" clearly refers to the idea presented in Sentence 4 that commute-free remote work automatically improves productivity and creativity. Sentence 3 qualifies that claim by pointing out the importance of informal office interactions, such as water-cooler conversations, for innovation.

Thus, the paragraph moves from the benefits of shorter commutes, to evidence supporting that view, to an argument favouring remote work, and finally to a limitation of that argument.

Therefore, the correct sequence is $2 \rightarrow 1 \rightarrow 4 \rightarrow 3$.

Hence, the correct order is 2143.

22. Correct Answer: D

This is an Odd Sentence Placement question. The key to solving such questions is to identify where the given sentence best connects the ideas before and after it. The inserted sentence should ensure a smooth logical flow and should neither introduce an idea too early nor repeat something that has already been established.

The given sentence states: "Having made citizens more and less knowledgeable than their predecessors, the Internet has proved to be both a blessing and a curse." Notice that this sentence is a balanced conclusion. It summarizes both the positive and negative effects of the Internet that are discussed throughout the paragraph.

The paragraph begins by highlighting the unprecedented access to information available today. It then presents the positive side of technology by noting that serious and inquisitive students can access vast realms of knowledge. However, the author subsequently discusses the negative side, arguing that easy access to information can discourage deep study, weaken writing skills, and reinforce existing opinions rather than encouraging critical thinking.

Option 4 is the correct location because all the evidence needed to support the statement has already been presented by that point. The sentence neatly summarizes the entire discussion by concluding that the Internet has been both beneficial and harmful. Thus, it serves as an effective closing remark.

Option 1 is incorrect because the paragraph has not yet discussed either the positive or negative consequences of the Internet. Placing the sentence there would introduce a conclusion before the supporting arguments.

Option 2 is incorrect because only the positive effects of technology have been mentioned up to that point. The negative consequences appear later, so the balanced assessment of "blessing and curse" would be premature.

Option 3 is incorrect because the discussion of the Internet's harmful effects continues even after Blank 3. Inserting the sentence there would disrupt the flow and weaken the final argument.

Hence, the sentence fits best at Blank 4, where it effectively summarizes the author's overall assessment of the Internet.

Therefore, the correct answer is Option D.

23. Correct Answer: D

This question asks us to identify the option that best explains the meaning of the highlighted phrase, "the real story, buried in plain sight in medieval diplomatic texts, simply had not yet been put together by modern scholars." The phrase suggests that the relevant evidence was always available in historical records, but historians either overlooked it or interpreted it incorrectly. Recent research has re-examined these sources and arrived at a different conclusion about Ethiopia's role in the medieval world.

Option D is correct because it captures both aspects of the passage. It acknowledges that historians traditionally portrayed Ethiopia as weak and dependent on European military assistance, while recent studies have revealed a very different picture—one of an active, connected, and outward-looking kingdom engaged in diplomacy, religion, and commerce. The reference to texts being "cherry-picked" effectively conveys the idea that scholars focused on only part of the available evidence and missed the broader reality.

Option A is incorrect because it suggests that Ethiopia had close commercial and religious connections specifically with its aggressive neighbours. The passage does not make this claim. Instead, it focuses on Ethiopia's diplomatic, religious, and commercial engagement with Europe and its active role in shaping those relationships.

Option B is incorrect because the passage does not accuse medieval sources of deliberately promoting a misleading narrative. The issue lies with modern historians' interpretation of the evidence, not with the historical documents themselves.

Option C is incorrect because it merely states that medieval texts document strong connections between Ethiopia and Europe. While this is partly true, it fails to capture the central contrast in the passage—the correction of the traditional view that Ethiopia was weak and dependent on European assistance.

Hence, Option D best explains the meaning of the highlighted phrase because it accurately reflects how recent scholarship has reinterpreted existing evidence to challenge the traditional narrative about medieval Ethiopia.

24. Correct Answer: B

This is a Sentence Placement question. The key to solving it is to identify where the missing sentence creates the most natural flow of ideas. The given sentence explains one reason why couples choose secret weddings: they want to avoid the anxiety and pressure associated with a large, highly publicized wedding day.

Option 2 is the correct location because the paragraph immediately before Blank 2 discusses practical reasons for avoiding large weddings—high Covid case numbers and financial pressures caused by the cost-of-living crisis. The missing sentence adds another reason by highlighting the emotional burden and stress associated with traditional weddings. The next sentence then continues the list of motivations by adding, "Plus, it can't hurt that in celebrity circles getting married in secret is all the rage." Thus, the ideas flow smoothly from one reason to another.

Option 1 is incorrect because the discussion about secret weddings has not yet been introduced. The missing sentence talks specifically about the appeal of marrying in secret, so it would be premature at this point.

Option 3 is incorrect because the sentence that follows introduces an expert's opinion about the growing popularity of secret weddings. The missing sentence fits better before this transition rather than interrupting it.

Option 4 is incorrect because the following sentence, "They just want to get to the part where they are married," directly elaborates on the expert's observation that people want to avoid the spotlight and excessive wedding rituals. Inserting the given sentence here would weaken that natural connection.

Hence, the sentence fits best at Blank 2 because it logically extends the discussion of why many couples are choosing secret weddings and smoothly connects the ideas before and after it.

Therefore, the correct answer is Option B.

DILR

1. Correct Answer: A

A total of 12 goals were scored in 8 matches and each player scored atleast one goal and no of goals scored by each one of them is distinct so the possible number of goals scored by the players can be (1, 2, 3, 6) or (1, 2, 4, 5).

From statement 4 we know that Bimla scored 4 goals and since Harita scored more goals than Bimla so we can say that Harita scored 5 goals and the only case possible for total goals scored by each of the players is (1, 2, 4, 5). Now using statement 1, statement 3 and statement 4 we can say that the three consecutive matches in which Bimla scored will be 5th, 6th and 7th matches as Harita scored in 4th and 8th match and we get the following table:

Matches	Match-1	Match-2	Match-3	Match-4	Match-5	Match-6	Match-7	Match-8
Goals Scored		1		1		1		1
Players	Bimla-1			Harita-1	Bimla-1	Bimla-1	Bimla-1	Harita-1

From statement 5 and 6, we can conclude that the highest number of goals were scored in Match 1.

Let the no. of goals scored in 3rd and 7th match be 'a' each and no. of goals scored in 1st and 5th match be 'b' and 'c' respectively.

Therefore, $2a + b + c = 8$

If $a = 1$, then $b + c = 6$ therefore possible solutions for b and c will be 2 and 4 only

If $a = 2$, then $b + c = 4$ therefore possible solution for b and c will be 1 and 3 only but since highest goals scored is in Match 1 so then no. of goals scored in match 1 must be 3 and Harita must have scored 3 goals in match 1 as Harita scored 5 goals in exactly 3 matches. Therefore, we can see this is not possible because then the no. of goals scored in Match 1 becomes 4.

Therefore, the only possible solution is $a = 1$, $b = 4$ and $c = 2$

Matches	Match-1	Match-2	Match-3	Match-4	Match-5	Match-6	Match-7	Match-8
Goals Scored	4	1	1	1	2	1	1	1
Players	Bimla-1, Harita-3			Harita-1	Bimla-1,	Bimla-1	Bimla-1	Harita-1

The remaining 3 goals were scored in the match 2, 3 and 5 by Amla and Sarita in some order.

Matches	Match-1	Match-2	Match-3	Match-4	Match-5	Match-6	Match-7	Match-8
Goals Scored	4	1	1	1	2	1	1	1
Players	Bimla-1, Harita-3	Amla/Sarita- 1	Amla/Sarita- 1	Harita-1	Bimla-1, Amla/Sarita - 1	Bimla-1	Bimla-1	Harita-1

One goal was scored in match 7.

2. Correct Answer: D

A total of 12 goals were scored in 8 matches and each player scored atleast one goal and no of goals scored by each one of them is distinct so the possible number of goals scored by the players can be (1, 2, 3, 6) or (1, 2, 4, 5).

From statement 4 we know that Bimla scored 4 goals and since Harita scored more goals than Bimla so we can say that Harita scored 5 goals and the only case possible for total goals scored by each of the players is (1, 2, 4, 5). Now using statement 1, statement 3 and statement 4 we can say that the three consecutive matches in which Bimla scored will be 5th, 6th and 7th matches as Harita scored in 4th and 8th match and we get the following table:

Matches	Match-1	Match-2	Match-3	Match-4	Match-5	Match-6	Match-7	Match-8
Goals Scored		1		1		1		1
Players	Bimla-1			Harita-1	Bimla-1	Bimla-1	Bimla-1	Harita-1

From statement 5 and 6, we can conclude that the highest number of goals were scored in Match 1. Let the no. of goals scored in 3rd and 7th match be 'a' each and no. of goals scored in 1st and 5th match be 'b' and 'c' respectively.

Therefore, $2a + b + c = 8$

If $a = 1$, then $b + c = 6$ therefore possible solutions for b and c will be 2 and 4 only

If $a = 2$, then $b + c = 4$ therefore possible solution for b and c will be 1 and 3 only but since highest goals scored is in Match 1 so then no. of goals scored in match 1 must be 3 and Harita must have scored 3 goals in match 1 as Harita scored 5 goals in exactly 3 matches. Therefore, we can see this is not possible because then the no. of goals scored in Match 1 becomes 4.

Therefore, the only possible solution is $a = 1$, $b = 4$ and $c = 2$

Matches	Match-1	Match-2	Match-3	Match-4	Match-5	Match-6	Match-7	Match-8
Goals Scored	4	1	1	1	2	1	1	1
Players	Bimla-1, Harita-3			Harita-1	Bimla-1,	Bimla-1	Bimla-1	Harita-1

The remaining 3 goals were scored in the match 2, 3 and 5 by Amla and Sarita in some order.

Matches	Match-1	Match-2	Match-3	Match-4	Match-5	Match-6	Match-7	Match-8
Goals Scored	4	1	1	1	2	1	1	1
Players	Bimla-1, Harita-3	Amla/Sarita- 1	Amla/Sarita- 1	Harita-1	Bimla-1, Amla/Sarita - 1	Bimla-1	Bimla-1	Harita-1

So, the sequence of goals scored is 4, 1, 2, 1

3. Correct Answer: C

A total of 12 goals were scored in 8 matches and each player scored atleast one goal and no of goals scored by each one of them is distinct so the possible number of goals scored by the players can be (1, 2, 3, 6) or (1, 2, 4, 5).

From statement 4 we know that Bimla scored 4 goals and since Harita scored more goals than Bimla so we can say that Harita scored 5 goals and the only case possible for total goals scored by each of the players is (1, 2, 4, 5). Now using statement 1, statement 3 and statement 4 we can say that the three consecutive matches in which Bimla scored will be 5th, 6th and 7th matches as Harita scored in 4th and 8th match and we get the following table:

Matches	Match-1	Match-2	Match-3	Match-4	Match-5	Match-6	Match-7	Match-8
Goals Scored		1		1		1		1
Players	Bimla-1			Harita-1	Bimla-1	Bimla-1	Bimla-1	Harita-1

From statement 5 and 6, we can conclude that the highest number of goals were scored in Match 1. Let the no. of goals scored in 3rd and 7th match be 'a' each and no. of goals scored in 1st and 5th match be 'b' and 'c' respectively.

Therefore, $2a + b + c = 8$

If $a = 1$, then $b + c = 6$ therefore possible solutions for b and c will be 2 and 4 only

If $a = 2$, then $b + c = 4$ therefore possible solution for b and c will be 1 and 3 only but since highest goals scored is in Match 1 so then no. of goals scored in match 1 must be 3 and Harita must have scored 3 goals in match 1 as Harita scored 5 goals in exactly 3 matches. Therefore, we can see this is not possible because then the no. of goals scored in Match 1 becomes 4.

Therefore, the only possible solution is $a = 1$, $b = 4$ and $c = 2$

Matches	Match-1	Match-2	Match-3	Match-4	Match-5	Match-6	Match-7	Match-8
Goals Scored	4	1	1	1	2	1	1	1
Players	Bimla-1, Harita-3			Harita-1	Bimla-1,	Bimla-1	Bimla-1	Harita-1

The remaining 3 goals were scored in the match 2, 3 and 5 by Amla and Sarita in some order.

Matches	Match-1	Match-2	Match-3	Match-4	Match-5	Match-6	Match-7	Match-8
Goals Scored	4	1	1	1	2	1	1	1
Players	Bimla-1, Harita-3	Amla/Sarita- 1	Amla/Sarita- 1	Harita-1	Bimla-1, Amla/Sarita - 1	Bimla-1	Bimla-1	Harita-1

Therefore, both the statements are correct.

4. Correct Answer: B

A total of 12 goals were scored in 8 matches and each player scored atleast one goal and no of goals scored by each one of them is distinct so the possible number of goals scored by the players can be (1, 2, 3, 6) or (1, 2, 4, 5).

From statement 4 we know that Bimla scored 4 goals and since Harita scored more goals than Bimla so we can say that Harita scored 5 goals and the only case possible for total goals scored by each of the players is (1, 2, 4, 5). Now using statement 1, statement 3 and statement 4 we can say that the three consecutive matches in which Bimla scored will be 5th, 6th and 7th matches as Harita scored in 4th and 8th match and we get the following table:

Matches	Match-1	Match-2	Match-3	Match-4	Match-5	Match-6	Match-7	Match-8
Goals Scored		1		1		1		1
Players	Bimla-1			Harita-1	Bimla-1	Bimla-1	Bimla-1	Harita-1

From statement 5 and 6, we can conclude that the highest number of goals were scored in Match 1.

Let the no. of goals scored in 3rd and 7th match be 'a' each and no. of goals scored in 1st and 5th match be 'b' and 'c' respectively.

Therefore, $2a + b + c = 8$

If $a = 1$, then $b + c = 6$ therefore possible solutions for b and c will be 2 and 4 only

If $a = 2$, then $b + c = 4$ therefore possible solution for b and c will be 1 and 3 only but since highest goals scored is in Match 1 so then no. of goals scored in match 1 must be 3 and Harita must have scored 3 goals in match 1 as Harita scored 5 goals in exactly 3 matches. Therefore, we can see this is not possible because then the no. of goals scored in Match 1 becomes 4.

Therefore, the only possible solution is $a = 1$, $b = 4$ and $c = 2$

Matches	Match-1	Match-2	Match-3	Match-4	Match-5	Match-6	Match-7	Match-8
Goals Scored	4	1	1	1	2	1	1	1
Players	Bimla-1, Harita-3			Harita-1	Bimla-1,	Bimla-1	Bimla-1	Harita-1

The remaining 3 goals were scored in the match 2, 3 and 5 by Amla and Sarita in some order.

Matches	Match-1	Match-2	Match-3	Match-4	Match-5	Match-6	Match-7	Match-8
Goals Scored	4	1	1	1	2	1	1	1
Players	Bimla-1, Harita-3	Amla/Sarita- 1	Amla/Sarita- 1	Harita-1	Bimla-1, Amla/Sarita - 1	Bimla-1	Bimla-1	Harita-1

Hence, none of the statements is false.

5. Correct Answer: C

A total of 12 goals were scored in 8 matches and each player scored atleast one goal and no of goals scored by each one of them is distinct so the possible number of goals scored by the players can be (1, 2, 3, 6) or (1, 2, 4, 5).

From statement 4 we know that Bimla scored 4 goals and since Harita scored more goals than Bimla so we can say that Harita scored 5 goals and the only case possible for total goals scored by each of the players is (1, 2, 4, 5). Now using statement 1, statement 3 and statement 4 we can say that the three consecutive matches in which Bimla scored will be 5th, 6th and 7th matches as Harita scored in 4th and 8th match and we get the following table:

Matches	Match-1	Match-2	Match-3	Match-4	Match-5	Match-6	Match-7	Match-8
Goals Scored		1		1		1		1
Players	Bimla-1			Harita-1	Bimla-1	Bimla-1	Bimla-1	Harita-1

From statement 5 and 6, we can conclude that the highest number of goals were scored in Match 1. Let the no. of goals scored in 3rd and 7th match be 'a' each and no. of goals scored in 1st and 5th match be 'b' and 'c' respectively.

Therefore, $2a + b + c = 8$

If $a = 1$, then $b + c = 6$ therefore possible solutions for b and c will be 2 and 4 only

If $a = 2$, then $b + c = 4$ therefore possible solution for b and c will be 1 and 3 only but since highest goals scored is in Match 1 so then no. of goals scored in match 1 must be 3 and Harita must have scored 3 goals in match 1 as Harita scored 5 goals in exactly 3 matches. Therefore, we can see this is not possible because then the no. of goals scored in Match 1 becomes 4.

Therefore, the only possible solution is $a = 1$, $b = 4$ and $c = 2$

Matches	Match-1	Match-2	Match-3	Match-4	Match-5	Match-6	Match-7	Match-8
Goals Scored	4	1	1	1	2	1	1	1
Players	Bimla-1, Harita-3			Harita-1	Bimla-1,	Bimla-1	Bimla-1	Harita-1

The remaining 3 goals were scored in the match 2, 3 and 5 by Amla and Sarita in some order.

Matches	Match-1	Match-2	Match-3	Match-4	Match-5	Match-6	Match-7	Match-8
Goals Scored	4	1	1	1	2	1	1	1
Players	Bimla-1, Harita-3	Amla/Sarita- 1	Amla/Sarita- 1	Harita-1	Bimla-1, Amla/Sarita - 1	Bimla-1	Bimla-1	Harita-1

Therefore, none of the statements is necessarily true.

6. Correct Answer: 2

The amounts received can be obtained as follows:

$$390 = 2 \times 3 \times 5 \times 13, 210 = 2 \times 3 \times 5 \times 7, 165 = 3 \times 5 \times 11, 77 = 7 \times 11, 66 = 2 \times 3 \times 11$$

From the above information we can conclude that the number of times a particular token was given as follows:

Token	No. of times given
2	3
3	4
5	3
7	2
11	2
13	1

We know that there are five people who received the token and there are 6 people who awarded the token. From, statement 1 we know that Fatima gave token to 4 people except Qahira so the token number given by Fatima is 3, and Adhara gave token only to Pragnyaa so the token number given by Adhara is 13. Therefore, we can also say that Pragnyaa received 390,000 and Qahira received 77,000. From statement 2, we know that Rashida received highest number of tokens and we already concluded that Pragnyaa received a funding of 390,000 so we can say that Rashida received a funding of 210,000. Rashida did not receive a token from Esther so we can also conclude that Esther gave the token number 11.

	Adhara (13)	Bithi	Chhaya	Dhanavi	Esther (11)	Fathima (3)
Pragnyaa (390)	✓				x	✓
Qahira (77)	x				✓	x
Rashida (210)	x	✓	✓	✓	x	✓
Smera	x				✓	✓
Tantra	x				✓	✓

From statement 3, we can conclude that Dhanavi gave a token of 7, and Bethi Gave a token of either 2 or 5 and similarly Chhaya also gave a token of 2 or 5.

	Adhara (13)	Bithi (2/5)	Chhaya (2/5)	Dhanavi (7)	Esther (11)	Fathima (3)
Pragnyaa (390)	✓	✓	✓	x	x	✓
Qahira (77)	x	x	x	✓	✓	x
Rashida (210)	x	✓	✓	✓	x	✓
Smera (66/165)	x			x	✓	✓
Tantra (165/66)	x			x	✓	✓

Qahira received 2 tokens.

7. Correct Answer: B

The amounts received can be obtained as follows:

$$390 = 2 \times 3 \times 5 \times 13, 210 = 2 \times 3 \times 5 \times 7, 165 = 3 \times 5 \times 11, 77 = 7 \times 11, 66 = 2 \times 3 \times 11$$

From the above information we can conclude that the number of times a particular token was given as follows:

Token	No. of times given
2	3
3	4
5	3
7	2
11	2
13	1

We know that there are five people who received the token and there are 6 people who awarded the token. From, statement 1 we know that Fatima gave token to 4 people except Qahira so the token number given by Fatima is 3, and Adhara gave token only to Pragnyaa so the token number given by Adhara is 13. Therefore, we can also say that Pragnyaa received 390,000 and Qahira received 77,000. From statement 2, we know that Rashida received highest number of tokens and we already concluded that Pragnyaa received a funding of 390,000 so we can say that Rashida received a funding of 210,000. Rashida did not receive a token from Esther so we can also conclude that Esther gave the token number 11.

	Adhara (13)	Bithi	Chhaya	Dhanavi	Esther (11)	Fathima (3)
Pragnyaa (390)	✓				x	✓
Qahira (77)	x				✓	x
Rashida (210)	x	✓	✓	✓	x	✓
Smera	x				✓	✓
Tantra	x				✓	✓

From statement 3, we can conclude that Dhanavi gave a token of 7, and Bethi Gave a token of either 2 or 5 and similarly Chhaya also gave a token of 2 or 5.

	Adhara (13)	Bithi (2/5)	Chhaya (2/5)	Dhanavi (7)	Esther (11)	Fathima (3)
Pragnyaa (390)	✓	✓	✓	x	x	✓
Qahira (77)	x	x	x	✓	✓	x
Rashida (210)	x	✓	✓	✓	x	✓
Smera (66/165)	x			x	✓	✓
Tantra (165/66)	x			x	✓	✓

Pragnyaa definitely received a token from Bithi but not from Dhanavi.

8. Correct Answer: 3

The amounts received can be obtained as follows:

$$390 = 2 \times 3 \times 5 \times 13, 210 = 2 \times 3 \times 5 \times 7, 165 = 3 \times 5 \times 11, 77 = 7 \times 11, 66 = 2 \times 3 \times 11$$

From the above information we can conclude that the number of times a particular token was given as follows:

Token	No. of times given
2	3
3	4
5	3
7	2
11	2
13	1

We know that there are five people who received the token and there are 6 people who awarded the token. From, statement 1 we know that Fatima gave token to 4 people except Qahira so the token number given by Fatima is 3, and Adhara gave token only to Pragnyaa so the token number given by Adhara is 13. Therefore, we can also say that Pragnyaa received 390,000 and Qahira received 77,000. From statement 2, we know that Rashida received highest number of tokens and we already concluded that Pragnyaa received a funding of 390,000 so we can say that Rashida received a funding of 210,000. Rashida did not receive a token from Esther so we can also conclude that Esther gave the token number 11.

	Adhara (13)	Bithi	Chhaya	Dhanavi	Esther (11)	Fathima (3)
Pragnyaa (390)	✓				x	✓
Qahira (77)	x				✓	x
Rashida (210)	x	✓	✓	✓	x	✓
Smera	x				✓	✓
Tantra	x				✓	✓

From statement 3, we can conclude that Dhanavi gave a token of 7, and Bethi Gave a token of either 2 or 5 and similarly Chhaya also gave a token of 2 or 5.

	Adhara (13)	Bithi (2/5)	Chhaya (2/5)	Dhanavi (7)	Esther (11)	Fathima (3)
Pragnyaa (390)	✓	✓	✓	x	x	✓
Qahira (77)	x	x	x	✓	✓	x
Rashida (210)	x	✓	✓	✓	x	✓
Smera (66/165)	x			x	✓	✓
Tantra (165/66)	x			x	✓	✓

Chhaya awarded 3 tokens.

9. Correct Answer: 3

The amounts received can be obtained as follows:

$$390 = 2 \times 3 \times 5 \times 13, 210 = 2 \times 3 \times 5 \times 7, 165 = 3 \times 5 \times 11, 77 = 7 \times 11, 66 = 2 \times 3 \times 11$$

From the above information we can conclude that the number of times a particular token was given as follows:

Token	No. of times given
2	3
3	4
5	3
7	2
11	2
13	1

We know that there are five people who received the token and there are 6 people who awarded the token. From, statement 1 we know that Fatima gave token to 4 people except Qahira so the token number given by Fatima is 3, and Adhara gave token only to Pragnyaa so the token number given by Adhara is 13. Therefore, we can also say that Pragnyaa received 390,000 and Qahira received 77,000. From statement 2, we know that Rashida received highest number of tokens and we already concluded that Pragnyaa received a funding of 390,000 so we can say that Rashida received a funding of 210,000. Rashida did not receive a token from Esther so we can also conclude that Esther gave the token number 11.

	Adhara (13)	Bithi	Chhaya	Dhanavi	Esther (11)	Fathima (3)
Pragnyaa (390)	✓				x	✓
Qahira (77)	x				✓	x
Rashida (210)	x	✓	✓	✓	x	✓
Smera	x				✓	✓
Tantra	x				✓	✓

From statement 3, we can conclude that Dhanavi gave a token of 7, and Bethi Gave a token of either 2 or 5 and similarly Chhaya also gave a token of 2 or 5.

	Adhara (13)	Bithi (2/5)	Chhaya (2/5)	Dhanavi (7)	Esther (11)	Fathima (3)
Pragnyaa (390)	✓	✓	✓	x	x	✓
Qahira (77)	x	x	x	✓	✓	x
Rashida (210)	x	✓	✓	✓	x	✓
Smera (66/165)	x			x	✓	✓
Tantra (165/66)	x			x	✓	✓

Smera received 3 tokens.

10. Correct Answer: D

The amounts received can be obtained as follows:

$$390 = 2 \times 3 \times 5 \times 13, 210 = 2 \times 3 \times 5 \times 7, 165 = 3 \times 5 \times 11, 77 = 7 \times 11, 66 = 2 \times 3 \times 11$$

From the above information we can conclude that the number of times a particular token was given as follows:

Token	No. of times given
2	3
3	4
5	3
7	2
11	2
13	1

We know that there are five people who received the token and there are 6 people who awarded the token. From, statement 1 we know that Fatima gave token to 4 people except Qahira so the token number given by Fatima is 3, and Adhara gave token only to Pragnyaa so the token number given by Adhara is 13. Therefore, we can also say that Pragnyaa received 390,000 and Qahira received 77,000. From statement 2, we know that Rashida received highest number of tokens and we already concluded that Pragnyaa received a funding of 390,000 so we can say that Rashida received a funding of 210,000. Rashida did not receive a token from Esther so we can also conclude that Esther gave the token number 11.

	Adhara (13)	Bithi	Chhaya	Dhanavi	Esther (11)	Fathima (3)
Pragnyaa (390)	✓				x	✓
Qahira (77)	x				✓	x
Rashida (210)	x	✓	✓	✓	x	✓
Smera	x				✓	✓
Tantra	x				✓	✓

From statement 3, we can conclude that Dhanavi gave a token of 7, and Bethi Gave a token of either 2 or 5 and similarly Chhaya also gave a token of 2 or 5.

	Adhara (13)	Bithi (2/5)	Chhaya (2/5)	Dhanavi (7)	Esther (11)	Fathima (3)
Pragnyaa (390)	✓	✓	✓	x	x	✓
Qahira (77)	x	x	x	✓	✓	x
Rashida (210)	x	✓	✓	✓	x	✓
Smera (66/165)	x			x	✓	✓
Tantra (165/66)	x			x	✓	✓

Tantra can receive Rs 66000 or Rs 165000.

11. Correct Answer: 50

No. of girls = 15

Let the no. of boys be x

No. of singers = 6

No of boys who are singers = 4

Therefore, no of girls who are singers = 2

No of dancers = 10

No of boys who are dancers = 6

Therefore, no. of girls who are dancers = 4

No. of boys who are neither singers nor dancers = $x - 10$

No. of girls who are neither singers nor dancers = 9

Using statements 1 and 2, we get the following table:

	Not interested	1-day event	2-day event	3-day event
Boys (x)	$0.2x$	$0.8x$	$0.6x$	
Singers (4)				
Dancers (6)				
Neither singers nor dancers ($x-10$)				
Girls (15)	0	15		
Singers (2)	0	2		
Dancers (4)	0	4		
Neither singers nor dancers (9)	0	9		

Let the number of girls who are interested in attending a 2-day event be a and the number of girls who are dancers and are interested in 2-day event be b . Now using statements 3 and 4, we get

	Not interested	1-day event	2-day event	3-day event
Boys (x)	0.2x	0.8x	0.6x	
Singers (4)	0	4	4	4
Dancers (6)			$0.18x - 4$	2
Neither singers nor dancers (x-10)			0.42x	
Girls (15)	0	15	a	0
Singers (2)	0	2	$0.4a - b$	0
Dancers (4)	0	4	b	0
Neither singers nor dancers (9)	0	9	0.6a	0

Now, $2 \leq 0.18x - 4 \leq 6 \Rightarrow 6 \leq 0.18x \leq 10$. $0.18x$ should be integer for which x should be a multiple of 50, and $0.18x$ lies between 6 and 10; therefore, the only possible value of x is 50.

From statement 5, we can say that, $4 + 0.4a - b = 5 + b + 1$ or, $0.4a = 2 + 2b$ or, $a = 5(1 + b) \Rightarrow a$ should be a multiple of 5 as b is a whole number. So possible values of a can be 5, 10 or 15. Now, as the maximum value of b can be 4 and the maximum value of $0.4a - b$ can be 2, so the only possible value of a satisfying the conditions above is 5. If $a = 5$ then $b = 1$.

	Not interested	1-day event	2-day event	3-day event
Boys (50)	10	40	30	
Singers (4)	0	4	4	4
Dancers (6)	0/1	6/5	5	2
Neither singers nor dancers (x-10)	10/9	30/31	21	
Girls (15)	0	15	5	0
Singers (2)	0	2	2	0
Dancers (4)	0	4	0	0
Neither singers nor dancers (9)	0	9	3	0

Therefore, there are 50 boys in the class.

12. Correct Answer: D

No. of girls = 15

Let the no. of boys be x

No. of singers = 6

No of boys who are singers = 4

Therefore, no of girls who are singers = 2

No of dancers = 10

No of boys who are dancers = 6

Therefore, no. of girls who are dancers = 4

No. of boys who are neither singers nor dancers = $x - 10$

No. of girls who are neither singers nor dancers = 9

Using statements 1 and 2, we get the following table:

	Not interested	1-day event	2-day event	3-day event
Boys (x)	$0.2x$	$0.8x$	$0.6x$	
Singers (4)				
Dancers (6)				
Neither singers nor dancers ($x-10$)				
Girls (15)	0	15		
Singers (2)	0	2		
Dancers (4)	0	4		
Neither singers nor dancers (9)	0	9		

Let the number of girls who are interested in attending a 2-day event be a and the number of girls who are dancers and are interested in 2-day event be b . Now using statements 3 and 4, we get

	Not interested	1-day event	2-day event	3-day event
Boys (x)	0.2x	0.8x	0.6x	
Singers (4)	0	4	4	4
Dancers (6)			$0.18x - 4$	2
Neither singers nor dancers (x-10)			0.42x	
Girls (15)	0	15	a	0
Singers (2)	0	2	$0.4a - b$	0
Dancers (4)	0	4	b	0
Neither singers nor dancers (9)	0	9	0.6a	0

Now, $2 \leq 0.18x - 4 \leq 6 \Rightarrow 6 \leq 0.18x \leq 10$. $0.18x$ should be integer for which x should be a multiple of 50, and $0.18x$ lies between 6 and 10; therefore, the only possible value of x is 50.

From statement 5, we can say that, $4 + 0.4a - b = 5 + b + 1$ or, $0.4a = 2 + 2b$ or, $a = 5(1 + b) \Rightarrow a$ should be a multiple of 5 as b is a whole number. So possible values of a can be 5, 10 or 15. Now, as the maximum value of b can be 4 and the maximum value of $0.4a - b$ can be 2, so the only possible value of a satisfying the conditions above is 5. If $a = 5$ then $b = 1$.

	Not interested	1-day event	2-day event	3-day event
Boys (50)	10	40	30	
Singers (4)	0	4	4	4
Dancers (6)	0/1	6/5	5	2
Neither singers nor dancers (x-10)	10/9	30/31	21	
Girls (15)	0	15	5	0
Singers (2)	0	2	2	0
Dancers (4)	0	4	0	0
Neither singers nor dancers (9)	0	9	3	0

Only II can be determined from the given information.

13. Correct Answer: A

No. of girls = 15

Let the no. of boys be x

No. of singers = 6

No of boys who are singers = 4

Therefore, no of girls who are singers = 2

No of dancers = 10

No of boys who are dancers = 6

Therefore, no. of girls who are dancers = 4

No. of boys who are neither singers nor dancers = $x - 10$

No. of girls who are neither singers nor dancers = 9

Using statements 1 and 2, we get the following table:

	Not interested	1-day event	2-day event	3-day event
Boys (x)	$0.2x$	$0.8x$	$0.6x$	
Singers (4)				
Dancers (6)				
Neither singers nor dancers ($x-10$)				
Girls (15)	0	15		
Singers (2)	0	2		
Dancers (4)	0	4		
Neither singers nor dancers (9)	0	9		

Let the number of girls who are interested in attending a 2-day event be a and the number of girls who are dancers and are interested in 2-day event be b . Now using statements 3 and 4, we get

	Not interested	1-day event	2-day event	3-day event
Boys (x)	0.2x	0.8x	0.6x	
Singers (4)	0	4	4	4
Dancers (6)			$0.18x - 4$	2
Neither singers nor dancers (x-10)			0.42x	
Girls (15)	0	15	a	0
Singers (2)	0	2	$0.4a - b$	0
Dancers (4)	0	4	b	0
Neither singers nor dancers (9)	0	9	0.6a	0

Now, $2 \leq 0.18x - 4 \leq 6 \Rightarrow 6 \leq 0.18x \leq 10$. $0.18x$ should be integer for which x should be a multiple of 50, and $0.18x$ lies between 6 and 10; therefore, the only possible value of x is 50.

From statement 5, we can say that, $4 + 0.4a - b = 5 + b + 1$ or, $0.4a = 2 + 2b$ or, $a = 5(1 + b) \Rightarrow a$ should be a multiple of 5 as b is a whole number. So possible values of a can be 5, 10 or 15. Now, as the maximum value of b can be 4 and the maximum value of $0.4a - b$ can be 2, so the only possible value of a satisfying the conditions above is 5. If $a = 5$ then $b = 1$.

	Not interested	1-day event	2-day event	3-day event
Boys (50)	10	40	30	
Singers (4)	0	4	4	4
Dancers (6)	0/1	6/5	5	2
Neither singers nor dancers (x-10)	10/9	30/31	21	
Girls (15)	0	15	5	0
Singers (2)	0	2	2	0
Dancers (4)	0	4	0	0
Neither singers nor dancers (9)	0	9	3	0

Required fraction = $35/65 = 7/13$

14. Correct Answer: D

No. of girls = 15

Let the no. of boys be x

No. of singers = 6

No of boys who are singers = 4

Therefore, no of girls who are singers = 2

No of dancers = 10

No of boys who are dancers = 6

Therefore, no. of girls who are dancers = 4

No. of boys who are neither singers nor dancers = $x - 10$

No. of girls who are neither singers nor dancers = 9

Using statements 1 and 2, we get the following table:

	Not interested	1-day event	2-day event	3-day event
Boys (x)	$0.2x$	$0.8x$	$0.6x$	
Singers (4)				
Dancers (6)				
Neither singers nor dancers ($x-10$)				
Girls (15)	0	15		
Singers (2)	0	2		
Dancers (4)	0	4		
Neither singers nor dancers (9)	0	9		

Let the number of girls who are interested in attending a 2-day event be a and the number of girls who are dancers and are interested in 2-day event be b . Now using statements 3 and 4, we get

	Not interested	1-day event	2-day event	3-day event
Boys (x)	0.2x	0.8x	0.6x	
Singers (4)	0	4	4	4
Dancers (6)			$0.18x - 4$	2
Neither singers nor dancers (x-10)			0.42x	
Girls (15)	0	15	a	0
Singers (2)	0	2	$0.4a - b$	0
Dancers (4)	0	4	b	0
Neither singers nor dancers (9)	0	9	0.6a	0

Now, $2 \leq 0.18x - 4 \leq 6 \Rightarrow 6 \leq 0.18x \leq 10$. $0.18x$ should be integer for which x should be a multiple of 50, and $0.18x$ lies between 6 and 10; therefore, the only possible value of x is 50.

From statement 5, we can say that, $4 + 0.4a - b = 5 + b + 1$ or, $0.4a = 2 + 2b$ or, $a = 5(1 + b) \Rightarrow a$ should be a multiple of 5 as b is a whole number. So possible values of a can be 5, 10 or 15. Now, as the maximum value of b can be 4 and the maximum value of $0.4a - b$ can be 2, so the only possible value of a satisfying the conditions above is 5. If $a = 5$ then $b = 1$.

	Not interested	1-day event	2-day event	3-day event
Boys (50)	10	40	30	
Singers (4)	0	4	4	4
Dancers (6)	0/1	6/5	5	2
Neither singers nor dancers (x-10)	10/9	30/31	21	
Girls (15)	0	15	5	0
Singers (2)	0	2	2	0
Dancers (4)	0	4	0	0
Neither singers nor dancers (9)	0	9	3	0

The number of male dancers who are interested in attending a 1-day event are 5 or 6

15. Correct Answer: C

No. of girls = 15

Let the no. of boys be x

No. of singers = 6

No of boys who are singers = 4

Therefore, no of girls who are singers = 2

No of dancers = 10

No of boys who are dancers = 6

Therefore, no. of girls who are dancers = 4

No. of boys who are neither singers nor dancers = $x - 10$

No. of girls who are neither singers nor dancers = 9

Using statements 1 and 2, we get the following table:

	Not interested	1-day event	2-day event	3-day event
Boys (x)	$0.2x$	$0.8x$	$0.6x$	
Singers (4)				
Dancers (6)				
Neither singers nor dancers ($x-10$)				
Girls (15)	0	15		
Singers (2)	0	2		
Dancers (4)	0	4		
Neither singers nor dancers (9)	0	9		

Let the number of girls who are interested in attending a 2-day event be a and the number of girls who are dancers and are interested in 2-day event be b . Now using statements 3 and 4, we get

	Not interested	1-day event	2-day event	3-day event
Boys (x)	0.2x	0.8x	0.6x	
Singers (4)	0	4	4	4
Dancers (6)			$0.18x - 4$	2
Neither singers nor dancers (x-10)			0.42x	
Girls (15)	0	15	a	0
Singers (2)	0	2	$0.4a - b$	0
Dancers (4)	0	4	b	0
Neither singers nor dancers (9)	0	9	0.6a	0

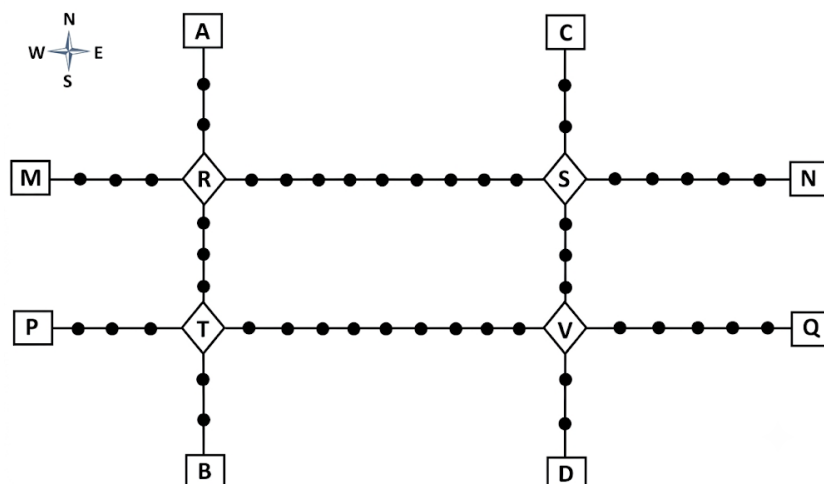
Now, $2 \leq 0.18x - 4 \leq 6 \Rightarrow 6 \leq 0.18x \leq 10$. $0.18x$ should be integer for which x should be a multiple of 50, and $0.18x$ lies between 6 and 10; therefore, the only possible value of x is 50.

From statement 5, we can say that, $4 + 0.4a - b = 5 + b + 1$ or, $0.4a = 2 + 2b$ or, $a = 5(1 + b) \Rightarrow a$ should be a multiple of 5 as b is a whole number. So possible values of a can be 5, 10 or 15. Now, as the maximum value of b can be 4 and the maximum value of $0.4a - b$ can be 2, so the only possible value of a satisfying the conditions above is 5. If $a = 5$ then $b = 1$.

	Not interested	1-day event	2-day event	3-day event
Boys (50)	10	40	30	
Singers (4)	0	4	4	4
Dancers (6)	0/1	6/5	5	2
Neither singers nor dancers (x-10)	10/9	30/31	21	
Girls (15)	0	15	5	0
Singers (2)	0	2	2	0
Dancers (4)	0	4	0	0
Neither singers nor dancers (9)	0	9	3	0

No female dancer is interested in attending a 2-day event.

16. Correct Answer: C



First, we need to find the time taken from all terminals to all junctions through stations

$M \rightarrow R = 2 + 2 + 2 + 2(3 \text{ stations gap is } 4) + 3 \text{ (every station stops)} = 11 \text{ min}$

$P \rightarrow T = 2 + 2 + 2 + 2 + 3 \text{ (same as above)} = 11 \text{ min}$

$R \rightarrow S = 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2(9 \text{ stations so gap is } 10) + 9(9 \text{ stations}) = 20 \text{ min} + 9 \text{ min} = 29 \text{ min}$

$T \rightarrow V = \text{symmetrical as } R \rightarrow S = 20 + 9 = 29 \text{ min}$

$S \rightarrow N = 2 + 2 + 2 + 2 + 2 + 2 + 5 = 12 + 5 = 17 \text{ min}$

$V \rightarrow Q = 12 + 5 = 17 \text{ min}$

$A \rightarrow R = 3 + 3 + 3 + 2 = 11 \text{ min}$

$C \rightarrow S = 3 + 3 + 3 + 2 = 11 \text{ min}$

$R \rightarrow T = 3 + 3 + 3 + 3 + 3 = 15 \text{ min}$

$S \rightarrow V = 3 + 3 + 3 + 3 + 3 = 15 \text{ min}$

$T \rightarrow B = 3 + 3 + 3(\text{for north south direction train takes } 3 \text{ minutes}) + 2 = 11 \text{ min}$

$V \rightarrow D = 3 + 3 + 3 + 2 = 11 \text{ min}$

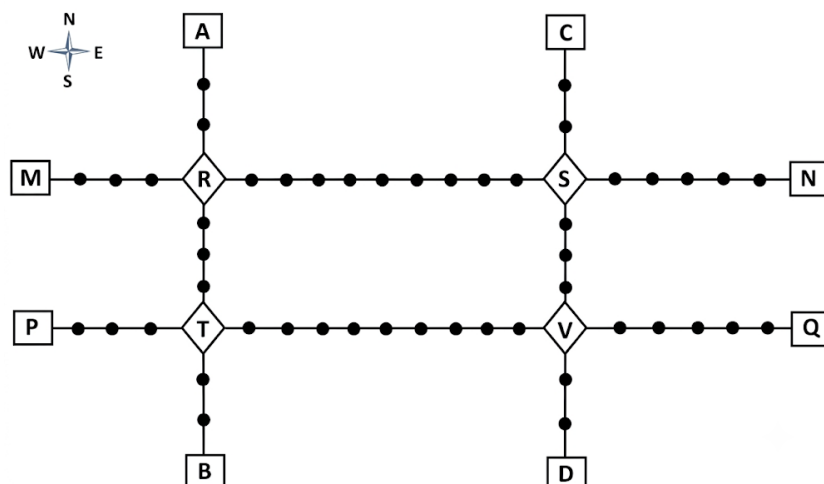
Hari is ready to board at 8:05 am from station M to N. As he has to reach at the earliest so he has to go straight from $M \rightarrow N$ via R and S.

Now we know a train would leave at 6 am then 6:10 as a train leaves after every 10 minutes in the east west direction and so on. We have to find which train will he board close to 8:05 am. So, he will board a train which will leave at 8:10 as the train at 8:00 am would have already left. Therefore, he has to wait for 5 minutes

$M \rightarrow N = 5 \text{ min (he waited)} + (M \rightarrow R) + (R \rightarrow S) + (S \rightarrow N) = 5 + 11 + 29 + 17 = 66 \text{ min}$

$8:05 + 66 \text{ min} = 9:11 \text{ am.}$

17. Correct Answer: A



If Priya is ready to board at 10:25 from station T, we need to check whether there is a train from P or B around 10:25 am. As BT path has a smaller number of stations which is 2 so we will take BT path.

If a train leaves at 10:00 from B it will take 11 minutes to reach T i.e., 10:11 and it would leave at 10:13 so, Priya won't be able to catch this train.

If train leaves at 10:10 from B it will reach T at 10:21 and would leave at 10:23 so again she won't be able to catch this train also.

If train leaves at 10:20 from B it will reach at 10:31 and leave at 10:33 which means Priya had to wait for 8 minutes and board this train.

$8 \text{ min} + (T \rightarrow R) + (R \rightarrow S) = 8 \text{ min} + 15 \text{ min} + 29 \text{ min} = 52 \text{ min}$ which means she would reach S at $10:33 + 52 \text{ min} = 11:25 \text{ am}$ which is not in option.

So, we will check the other option

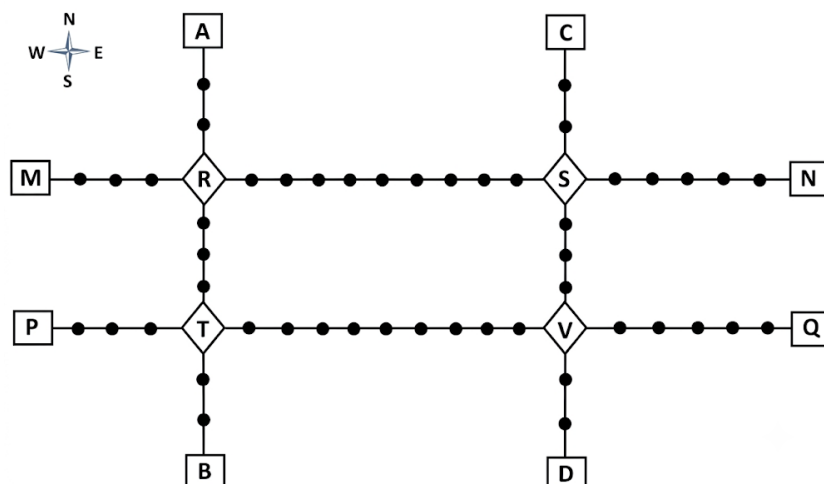
As we know for every north-south direction the train can leave after every 15 minutes also.

If the train leaves from B at 10:15 then it will reach T at 10:26. It would leave at 10:28 from station T.

So, Priya had waited for 3 minutes.

$3 \text{ min} + (T \rightarrow R) + (R \rightarrow S) = 3 + 15 + 29 = 47 \text{ minutes}$ which means she would reach station S at $10:25 + 47 \text{ min} = 10:25 + 35 \text{ min} + 12 \text{ min} = 11:12 \text{ min}$ which is option 1

18. Correct Answer: A



Travelling time between S and R = $(10 \times 2) + (9 \times 1) = 29$ minutes

There is a stoppage of 2 minutes at R

Travelling time between R and B = $(7 \times 3) + (1 \times 2) + (5 \times 1) = 28$ minutes

In the north-south direction, the first train from A arrives at R at time = 6 am + $(3 \times 3) + (2 \times 1) = 6:11$ am.

Since R is a junction so this train will halt for 2 minutes at R and leave at 6:13.

Every 15 minutes, a train starts from A in the north-south direction.

The last train that leaves A will be at 12:00 am and it will leave R at 12:13 am, so Haripriya must reach R till 12:13 am.

Travelling time between S and R = $(10 \times 2) + (9 \times 1) = 29$ minutes

So, Haripriya must board the train at S by 11:44 pm

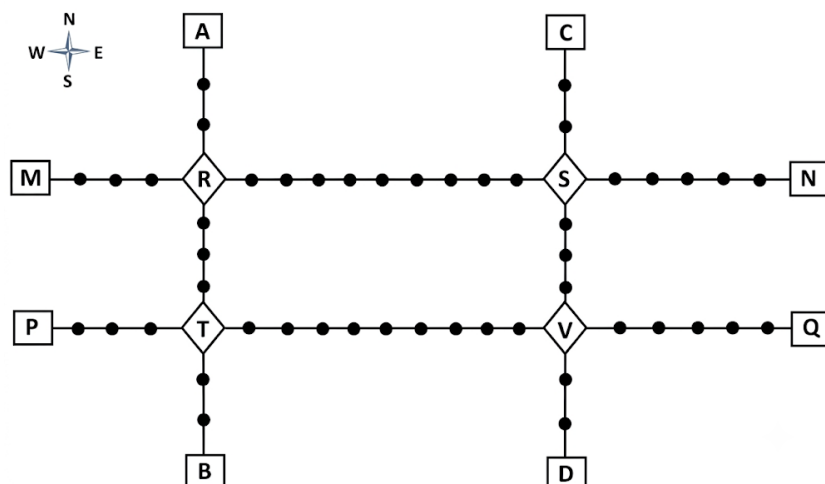
In the east-west direction, the first train from N arrives at S at time = 6 am + $(6 \times 2) + (5 \times 1) = 6:17$ am.

Since S is a junction so this train will halt for 2 minutes at S and leave at 6:19.

Every 10 minutes, a train starts from N in the east-west direction.

Therefore, Haripriya should board the train which leaves S at 11:39.

19. Correct Answer: 8



For minimum number of trains, we need to check that by the time first train reach at the other terminal, we keep on sending the trains.

For AB line total time taken = $A \rightarrow R \rightarrow T \rightarrow B = 11 + 2 + 15 + 2 + 11 + 15 = 56$ min

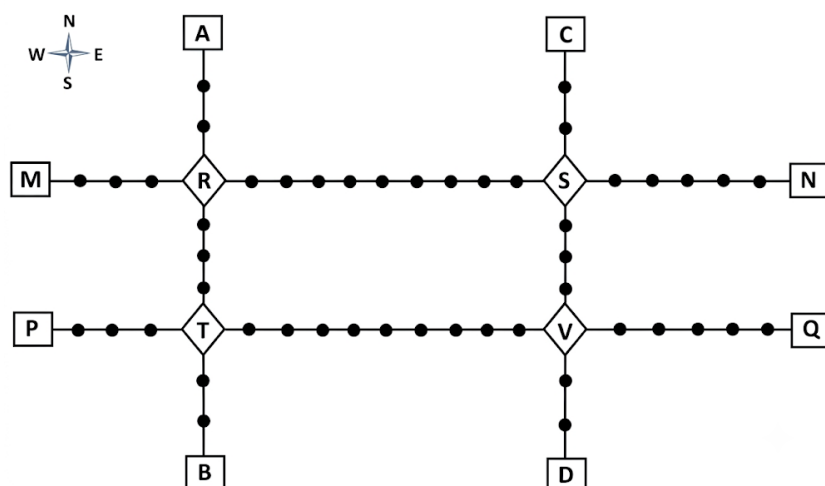
For BA line total time taken $B \rightarrow T \rightarrow R \rightarrow A = 15 + 11 + 2 + 15 + 2 + 11 = 56$ min

Total time for AB + BA = $56 + 56 = 112$ min

For north south direction we can send trains after every 15 mins

Total number of trains = $112/15 = 7.4$ approx., which implies there are more than 7 gaps, so 8 trains can be sent. Therefore 8 trains is the answer.

20. Correct Answer: 48



Total number of trains that required to provide in the city can be calculated through total number of trains across all the roots

For east-west route trains leave after every 10 minutes and rest of 15 minutes is also given after

reaching the last terminal

$$M \rightarrow R \rightarrow S \rightarrow N = 11 + 2 + 29 + 2 + 17 = 61 \text{ min}$$

$$P \rightarrow T \rightarrow V \rightarrow Q = 11 + 2 + 29 + 2 + 17 = 61 \text{ min}$$

For east west trains total time = $(61 + 61 + 15) = 76$ minutes each for MN and PQ

$$\text{Total time} = 76 \times 2 = 152$$

Every train comes after 10 minutes, number of trains $= 152/10 = 15.2$ as gap is more than 15 so number of trains in east-west direction = $MN + PQ = 16 + 16 = 32$ trains

Similarly, for north-south direction trains leave after every 15 minute and rest of 15 minutes is same

$$A \rightarrow R \rightarrow T \rightarrow B = C \rightarrow S \rightarrow V \rightarrow D = 11 + 2 + 15 + 2 + 11 + 15 = 56 \text{ min} + 56 \text{ min} = 112 \text{ min}$$

Number of trains $= 112/15 = 7.4$ approx. implies more than 7 gaps are there so number of trains each side = 8. Total trains north-south direction = $8 + 8 = 16$

Therefore, total number of trains = trains in north-south direction + trains in east-west direction = $16 + 32 = 48$



Quant

1. Correct Answer: 82

$$\text{Let } A = 3^k + 4^k + 5^k$$

3^k will always be odd as odd number to the power odd is always odd.

4^k will always be even as even number to the power even is always even

5^k will always be odd as odd number to the power odd is always odd

Therefore, A will always be even as odd + even + odd = even

So, it will be always divisible by 2

Therefore, larger positive integer that divides all the numbers of the form has to be 2

So, $A = 2$

B be the largest positive integer that divides all numbers of the form

$$B = 4^k + 3(4^k) + 4^{k+2}$$

$$B = 4^k + 3 \cdot 4^k + 4^k \cdot 4^2 = 4^k (1 + 3 + 16) = 4^k \times 20$$

If we put $k = 1$, then $B = 4 \times 20 = 80$

$$\text{Then } A + B = 2 + 80 = 82$$

2. Correct Answer: 34

Given that, $xy + yz = 19$, $y(x + z) = 19$

Now, we have two cases

$$y = 1, x + z = 19 \dots\dots\dots (1)$$

$y = 19, x + z = 1$ which is not possible as x and z are natural numbers so they cannot take value less than 1

$$yz + xz = 51$$

$$z(y+x) = 51$$

$$z = 3, y + x = 17 \dots\dots\dots (2)$$

$$\text{or } z = 17, y + x = 3 \dots\dots\dots (3)$$

Combining (1) and (2) together

$$y = 1, x = 16, z = 3 \text{ then } xyz = 16 \times 1 \times 3 = 48$$

Combining (1) and (3) together

$$z = 17, y = 1, x = 2 \text{ then } xyz = 2 \times 1 \times 17 = 34$$

Hence the minimum value of $xyz = 34$

3. Correct Answer: D

Let the first part be x and second part be y

According to question

$$\Rightarrow \frac{x \times 15 \times 4}{100} = \frac{y \times 12 \times 3}{100}$$

$$\Rightarrow 60x = 36y$$

$$\Rightarrow 5x = 3y \Rightarrow \frac{x}{y} = \frac{3}{5} \Rightarrow \text{total saving} = 8$$

$$\% \text{age saving in first part} = \frac{3}{8} \times 100 = 37.5\%$$

Hence, option 4.

4. Correct Answer: 8

Given, $a^2 + ab + a = 14$ and $b^2 + ab + b = 28$

$\Rightarrow a(a + b + 1) = 14$ and $b(b + a + 1) = 28$

Dividing both, we get $a/b = 1/2$

Now, if $a = 1$ and $b = 2$, $a^2 + ab + a = 4$, not true

If $a = 2$ and $b = 4$, $a^2 + ab + a = 14$ and $b^2 + ab + b = 28$ satisfies

Hence, $2a + b = 8$

5. Correct Answer: C

Let a , b , c and d be the number of students who like none of the drinks, exactly one drink, exactly 2 drinks, and all three drinks, respectively.

Hence $a + b + c + d = 100$ (1).

Also, $b + 2c + 3d = 73 + 80 + 52$.

So, $b + 2c + 3d = 205$... (2)

Subtracting (1) from (2) we get, $c + 2d - a = 105$. Maximum value d can take is 52 i.e. $d = 52$, $c = 1$, $a = 0$

The minimum value d can take is 5, i.e. $d = 5$, $c = 95$ and $a = 0$ (This also satisfies equation (1).

Difference = $52 - 5 = 47$

Hence, the difference between the minimum and maximum number of people who like all the 3 drinks is 47.

6. Correct Answer: D

Let the lemon juice be 10 litre

Let the sugar juice be 10 litre

Total mixture = 20 litre

New mixture sugar added be in the ratio 1:3

20 litre mixture and 60 litre sugar syrup

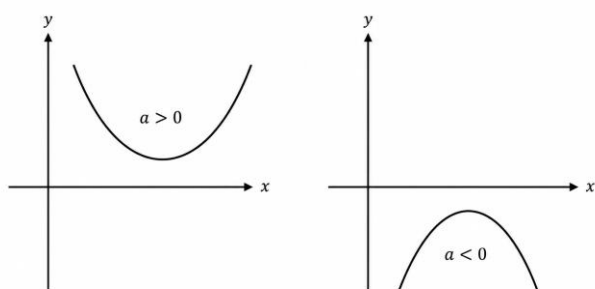
New lemon juice = 10 litre

New sugar syrup = $10 + 60 = 70$

Therefore, required ratio = $10: 70 = 1: 7$. Hence, Option 4

7. Correct Answer: B

$b^2 < 4ac$ implies $D < 0$ which has imaginary roots which gives 2 cases



In first case $f(m) > 0$ for all 'm'. So, in this case there is no integer for which $f(m) < 0$.

In second case $f(m) < 0$ for all 'm' and hence, set S contains all the integers.

Therefore, option 2 is the answer.

8. Correct Answer: 160

Let cost price of syrup = Rs $80x$ /kg

Cost price of juice = Rs $100x$ /kg

Total cost = $80x \times 100 + 100x \times 120 = 20800x$

Selling price = $80x \times 1.1 \times 10 \text{ kg} + 100x \times 1.2 \times 20 \text{ kg} + 308.32 \times 200 \text{ kg}$

$= 880x + 2400x + 61664 = 3280x + 61664$

Selling price = cost price $\times 1.64 = 20800x \times 1.64 = 34112x$

Equating selling price = $34112x = 3280x + 61664$

$30832x = 61664 \Rightarrow x = 2$

Cost price of syrup = $80x = 160$

9. Correct Answer: 43200

Let the number of males be $5k$

Let the number of females be $4k$

Let the number of literate males = $2x$

Let the number of literate females = $3x$

Let the number of illiterate males = $4y$

Let the number of illiterate females = $3y$

According to question

Literate males = $2x = 3600 \Rightarrow x = 1800$

Literate females = $3x = 3 \times 1800 = 5400$

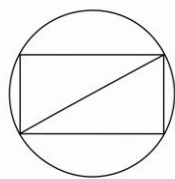
Now, total ratio of males and females

$$\Rightarrow \frac{2x + 4y}{3x + 3y} = \frac{5k}{4k} = \frac{5}{4}$$

$$\Rightarrow 8x + 16y = 15x + 15y \Rightarrow 7x = y \Rightarrow \frac{x}{y} = \frac{1}{7}$$

Total number of females in the village = $3x + 3y = 3x + 3 \times 7x = 24x = 24 \times 1800 = 43200$

10. Correct Answer: C



Let the radius of the circle be R

Diameter of the circle = $2R$

Let the length of rectangle be ' l '

Let the breadth of rectangle be ' b '

Diagonal of the rectangle = diameter of the circle = $(2R)^2 = (\sqrt{l^2 + b^2})^2 = l^2 + b^2$

$$4R^2 = l^2 + b^2 \dots\dots\dots (1)$$

Let the perimeter of the rectangle be $P = 2(l + b) \dots\dots\dots (2)$

$$l + b = \frac{P}{2} \dots\dots\dots (3)$$

Squaring both sides, $l^2 + b^2 + 2lb = \frac{P^2}{4} \dots\dots\dots (4)$

$$\Rightarrow 4R^2 + 2A = \frac{P^2}{4} \Rightarrow 2A = \frac{P^2}{4} - 4R^2 \Rightarrow A = \frac{P^2}{8} - 2R^2.$$

Hence, option 3.

11. Correct Answer: D

As we know diagonals of a parallelogram bisect each other.

Let the diagonals be AC and BD

A(1,1) B(3,4) C(-2,8) and D(x,y)

Using mid-point formula

$$AC = BD$$

$$\Rightarrow \frac{1+2}{2} = \frac{3+x}{2} \Rightarrow -1 = 3+x \Rightarrow x = -4$$

$$\Rightarrow \frac{1+8}{2} = \frac{4+y}{2} \Rightarrow 9 = 4+y \Rightarrow y = 5. \text{ Therefore, D is } (-4, 5). \text{ Hence, option 4.}$$

12. Correct Answer: C

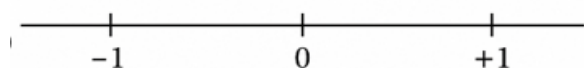
$$|x + a| + |x - 1| = 2$$

For infinite number of solutions, the critical points value difference must be equal to the right-hand side value.

Using option 1, $a = -1$, we get

$$|x - (-1)| + |x - 1| = 2$$

For the critical points -1 and 1 whose sum = $1 - (-1) = 2 = \text{RHS}$



Therefore, the largest value of $a = 1$, we will get infinite number of solutions

13. Correct Answer: 84

Let the four children be a, b, c and d

As per the condition, $a + b + c + d = 20$

Now as we know that each student will get even number of balloons

$$2x + 2y + 2z + 2p = 20$$

$\Rightarrow x + y + z + p = 10$, as each child must get 1 balloon, so giving 1 balloon to each child

$$A + B + C + D = 10 - 4 = 6$$

Now finding total number of non-negative integral solutions,

$$\text{We get, } {}^{6+3}C_3 = 9C_3 = \frac{9 \times 8 \times 7}{3 \times 2 \times 1} = 3 \times 4 \times 7 = 84$$

14. Correct Answer: B

Sum of n terms of an arithmetic progression $S_n = n + 2n^2$

$$\text{Putting } n = 1, S_1 = 1 + 2(1)^2 = 1 + 2 = 3, a_1 = 3$$

$$\text{Putting } n = 2, S_2 = 2 + 2(2)^2 = 2 + 8 = 10, a_1 + a_2 = 10 \quad 3 + a_2 = 10 \quad a_2 = 7$$

$$\text{Putting } n = 3, S_3 = 3 + 2(3)^2 = 3 + 2 \times 9 = 21, a_1 + a_2 + a_3 = 21 \quad a_3 = 21 - 10 = 11$$

$$\text{Putting } n = 4, S_4 = 4 + 2(4)^2 = 4 + 2 \times 16 = 4 + 32 = 36, a_4 = 36 - (3+7+11) = 36 - 21 = 15$$

$$\text{Putting } n = 5, S_5 = 5 + 2(5)^2 = 5 + 2 \times 25 = 55, a_5 = 55 - (3+7+11+15) = 55 - 36 = 19$$

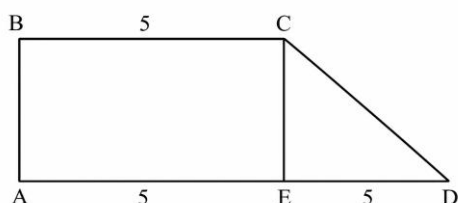
$$\text{Putting } n = 6, S_6 = 6 + 2(6)^2 = 6 + 2 \times 36 = 6 + 72 = 78, a_6 = 78 - 55 = 23$$

$$\text{Putting } n = 7, S_7 = 7 + 2(7)^2 = 7 + 2 \times 49 = 7 + 98 = 105, a_7 = 105 - 78 = 27$$

Now as we have got the Arithmetic series as, 3, 7, 11, 15, 19, 23, 27

We can see the smallest multiple of 9 is 27 which is a_7 so the value of $n = 7$. Hence, option 2.

15. Correct Answer: 66



As $\angle BAD = 90^\circ$ and $AD \parallel BC$

As ABCE is a rectangle so $BC = AE = 3$ cm

As $AD = 8$ hence, $ED = 8 - 3 = 5$

As $\angle BAD = 90^\circ$ and BA and CE are parallel so $\angle CED = 90^\circ$

So, $BA = CE = x$ and $CD = y$

As $ED = 5$, we know the only Pythagoras triplet is 5, 12, 13

Also, perimeter of trapezium $= x + 3 + 8 + y = 36$

$$x + y = 36 - 11 = 25$$

So, $x = 12$ and $y = 13$ as 5, 12, 13 make a Pythagoras triplet $x + y = 25$

$$\text{Area of a trapezium} = \frac{1}{2}(\text{sum of parallel sides}) \times \text{distance between them} = \frac{1}{2}(3 + 8) \times 12 = 66 \text{ cm}^2$$

16. Correct Answer: A

Using option 2, $a = 25$

$$|x - 25| + |x - 100| + |x - 25 - 50| = |x - 25| + |x - 100| + |x - 75|$$

Critical points are 25, 75, 100

Putting these in the equations, we get maximum value = 125 when $a = 25$

When, $a = 50$

$$|x - 50| + |x - 100| + |x - 50 - 50| = |x - 25| + |x - 100| + |x - 150|$$

put $x = 50$

We get maximum value of $f(x) = 100$

17. Correct Answer: B

Sum of 3 integers = $13 \times 3 = 39$

When a natural number n is included

Average of 4 integers = $\frac{39 + n}{4}$ = odd no.

Putting $n = 5$, $\frac{39 + 5}{4} = \frac{44}{4} = 11$ which is an odd no.

So, answer is option 2

18. Correct Answer: 44

$$\sum_{n=1}^N \left[\frac{1}{5} + \frac{n}{25} \right] = 25$$

$$\text{For } n = 20, \left[\frac{1}{5} + \frac{20}{25} \right] = 1$$

$$\text{For } n = 21, \left[\frac{1}{5} + \frac{21}{25} \right] = 1$$

$$\text{For } n = 22, \left[\frac{1}{5} + \frac{22}{25} \right] = 1$$

$$\text{For } n = 23, \left[\frac{1}{5} + \frac{23}{25} \right] = 1$$

$$\text{For } n = 24, \left[\frac{1}{5} + \frac{24}{25} \right] = 1$$

$$\text{For } n = 25, \left[\frac{1}{5} + \frac{25}{25} \right] = 1$$

$$\text{For } n = 26, \left[\frac{1}{5} + \frac{26}{25} \right] = 1$$

$$\text{For } n = 44, \left[\frac{1}{5} + \frac{44}{25} \right]$$

Sum of terms from $n = 20$ to 44, is $1 + 1 + \dots + 1 = 25$

For $n = 20, 21, 22, 23, \dots, 44$, therefore, $N = 44$

19. Correct Answer: B

Let the 1 kg price of cashews = C, 1kg price of peanuts = P, 1 kg price of almonds = A

$$7C = 30P = 9A = 630x$$

$$C = 90x \times 4 = 360x$$

$$P = 21x \times 14 = 294x$$

$$A = 70x \times 6 = 420x$$

$$\text{Total cost price} = 360x + 294x + 420x = 1074x$$

Let the selling price be y Rs/ kg

$$4y + 20y = 1752 \dots\dots (1)$$

$$4y + 16y = 744 \dots\dots (2)$$

Subtract (2) – (1)

$$4y = 1008 \Rightarrow 24y = 6048$$

$$\text{Total cost} = 6048 - 1752 = 1074x$$

$$1074x = 4296 \Rightarrow x = 4$$

$$\text{Price of almonds} = 420x = 420(4) = 1680, \text{ Hence, Option 2}$$

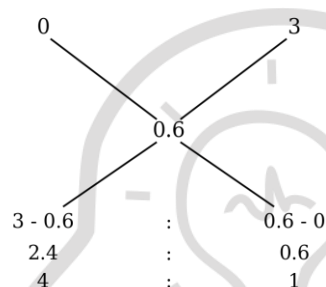
20. Correct Answer: C

Let the original average be 0

$$\text{The new average} = 0 + 3 = 3$$

$$\text{Overall change in average} = 0.6$$

Using alligation method



21. Correct Answer: 111

$$\text{Let the total number of persons ahead} = 3x$$

$$\text{Let the total number of persons behind} = 5x$$

$$\text{Total number of persons} = 3x + 5x + 1 < 300$$

$$8x < 300 - 1 = 299 \Rightarrow x < 37.3$$

$$\text{So, } x = 37 \text{ (integral value} = 37)$$

$$\text{No of persons ahead} = 3x = 3(37) = 111$$

22. Correct Answer: D

Let's suppose that train B take ' t ' time to reach at the meeting point

So train A should also take ' t ' time to reach at the meeting point

As train A takes total 10 minutes in reaching station Y. Therefore, time taken by Train A after meeting train B has to be ' $10 - t$ '

Time taken by train B to reach station X = 9 minutes

We know the formula for time taken after meeting = time of meeting = geometric means of time taken by both trains to reach their respective destinations after meeting

$$t = \sqrt{t_1 t_2} = \sqrt{9(10 - t)}$$

$$\text{Putting } t = 6 \text{ we get LHS} = \text{RHS} = 6$$

Therefore, the total time taken by train B to reach station X is $9 + 6 = 15$ minutes. Hence, option 4.

