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Instructions [1 - 4]

The passage below is accompanied by a set of questions. Choose the best answer to each question.

Comprehension:

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 behaviors 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 behavior.

1. "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 Meditation allows certain out-of-body experiences that permit us to gain the distance necessary to control our emotions.
- C The observation of emotions in a distant manner corresponds to the second movement referred to earlier in the passage.
- D Emotional responses can make it difficult to distinguish valuable experiences from valueless experiences.

Answer: B

▶ Video Solution

Explanation:

Option A: This is a possible implication because the passage states that through meditation and the right attitude, one allows emotions to happen to themselves, which implies a passive reception of those experiences.

Option B: The passage does not state or imply that meditation allows for certain out-of-body experiences or that it allows an individual to gain distance from their emotions in that way. The passage specifically highlights that through meditation and the right attitude, one

allows emotions to happen to themselves and then observes those emotions without necessarily acting on them, which allows one to achieve some distance and decide what has value and what does not have value. It does not mention anything about out-of-body experiences or any other kind of distance that is not achieved through the act of observing emotions.

Option C: This is a possible implication because the passage states that the second movement is what one does next about the emotion and that it occurs after thinking and is under one's control. Observing emotions in a distant manner, as described in the quote, would involve thinking and control and would therefore correspond to the second movement referred to earlier.

Option D: This is a possible implication because the quote mentions that observing emotions allows an individual to decide what has value and what does not have value, implying that emotional responses can make this distinction difficult.

Hence, Option B is the correct answer.



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2. Which one of the following statements would be an accurate inference from the example of Marcus Aurelius?

- A Marcus Aurelius was humiliated by the accusation of treason in front of the other officers.
- B Marcus Aurelius was a Stoic whose philosophy survived into the Roman era.
- C Marcus Aurelius plotted revenge in his quest for justice.
- D Marcus Aurelius was one of the leaders of the Roman army.

Answer: D

[▶ Video Solution](#)

Explanation:

Based on the discussion, Option D is the correct answer: the passage describes an example of what might have happened if an army general accused Marcus Aurelius of treason in front of other officers, implying that Marcus Aurelius was a leader in the Roman army. The other options are neither mentioned nor implied in the passage and are therefore not supported by the information provided.

Option A: is incorrect because the passage does not mention anything about Marcus Aurelius feeling humiliated or embarrassed by the accusation; it only describes the immediate feeling and other reactions that may have occurred in response to the stimulus of the accusation, such as surprise and anger.

Option B: is incorrect since the author does not label Marcus Aurelius as a Stoic or associate him with the philosophy of Stoicism in any way; he only uses him as an example of what might have happened in a specific situation involving an army general accusing him of treason.

Option C: is incorrect since the passage does not state that Marcus Aurelius was plotting revenge or seeking justice; it only mentions that one of the potential second movements that Marcus Aurelius might have chosen in response to the accusation could have been a plot to seek revenge. However, it does not state that this is what actually happened or that it was the only possible second movement that Marcus Aurelius could have chosen.

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

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

Answer: C

[▶ Video Solution](#)

Explanation:

In this question, we need to find a statement which is in line with the ideas given in the passage (then, if it is false, it will contradict the passage).

Option A: "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."

The above excerpt was written to describe the similarities between Stoicism and Buddhism. Since option A is not in line with the above excerpt's idea, it is not the correct option.

Option B: This option can easily be refuted on the basis of the information given in the first line of the passage. It cannot be inferred that Zeno survived into the Roman era until about AD 300.

Option C: "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."

Since this option reiterates the idea mentioned in the underlined portion of the above excerpt, this is the correct option.

Thus, the correct option is C.

4. On the basis of the passage, which one of the following statements can be regarded as true?

- A The Stoics valorised the pursuit of money, power, and sexual gratification.
- B The Stoic influences can be seen in multiple religions.
- C The Epicureans believed in controlling all emotions.
- D There were no Stoics in India at the time of the Roman civilisation.

Answer: B

 Video Solution

Explanation:

The passage states that "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." This aligns with the claim in Option B. Options A and C are incorrect as the passage states that the Stoics believed in freeing oneself of nearly all desires, including excessive desires for money, power, and sexual gratification [A], and that the Epicureans believed in enjoying simple pleasures but not being indulgent or pursuing things with no real value [not sufficient to validate C]. Similarly, we cannot substantiate the statement in D.

Hence, Option B is the correct answer.



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Instructions [5 - 8]

The passage below is accompanied by a set of questions. Choose the best answer to each question.

Comprehension:

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.'

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

Answer: B

▶ Video Solution

Explanation:

The passage discusses cultural differences in the concept of a copy and the value placed on originality, particularly in relation to art and religious buildings. In China, copies (fuzhipin) are considered to be of equal value to the original and do not carry negative connotations, while in the Western world, the idea of an unassailable original has historically held more importance. This difference in perspective has led to misunderstandings and tensions between China and Western museums when Chinese museums send copies abroad.

Based on the above, a Chinese museum would be unlikely to consider Option B [Pablo Picasso's painting of Vincent van Gogh's original painting, identical in every respect] as having less value than the original. This is because the Chinese concept of a copy (fuzhipin) refers to exact reproductions of the original that are considered to be of equal value to the original and do not carry negative connotations. Contrarily, Option A - a painting of Vincent van Gogh's original painting by Pablo Picasso with Picasso's signature - would not be considered a fuzhipin as it is not an exact reproduction of the original and bears the signature of a different artist. Similarly, Options C and D would also not be considered a fuzhipin since they are not an exact reproduction of the original [but merely different versions/formats].

Hence, Option B is the correct choice.

6. Which one of the following scenarios is unlikely to follow from the arguments in the passage?

- A A 17th-century British painter would have no problem adding personal touches when restoring an ancient Roman painting.
- B A 20th-century Japanese Buddhist monk would value a reconstructed shrine as the original.
- C 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.
- D A 21st-century Christian scientist is likely to oppose cloning because of his philosophical orientation.

Answer: C

▶ Video Solution

Explanation:

{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. .}

Based on the passage, the scenario in Option C [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] is unlikely to follow from the arguments in the passage. The passage mentions that in the 17th century, excavated artworks from antiquity were treated differently from how they are today and were not restored in a way that was faithful to the original. Instead, there was "massive intervention" in these works, changing their appearance. This suggests that the idea of an unassailable original may not have held as much importance in the 17th century as it does today. Therefore, it is unlikely that a 17th-century French artist who adhered to a Christian worldview would necessarily need to be completely true to the original intent of a painting when restoring it. Contrarily, we cannot definitively comment on the other scenarios - A, B, and D. Hence, Option C is the correct choice.

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

Answer: C

[▶ Video Solution](#)

Explanation:

{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. . . }

While we know that the cathedral of Freiburg Minster is continually undergoing restoration, the same cannot be said about Ise Grand Shrine - we are told that it is rebuilt periodically, but there is no information not substantiate that it is being continually restored [at least in the same sense as that conveyed in the passage]. The idea of restoration is based on how these monuments are being rebuilt.

Hence, Option C is the correct choice.

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8. 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 allows regular employment for certain craftsmen.
- C it discourages them from making interventions in ancient art.
- D it discourages them from carrying out human cloning.

Answer: D

[▶ Video Solution](#)

Explanation:

Option A: The value placed on an unassailable original in the Western world may discourage the simultaneous display of multiple copies of a painting, as the original is considered more valuable and authentic. Hence, Option A is valid.

Option B: This is a valid option because the value placed on the original artwork in the Western world may lead to the regular employment of craftsmen who are responsible for preserving and restoring original works of art. This can include tasks such as examining the artwork for damage and replacing eroded or damaged materials [restoration].

Option C: It is true that the focus on the original in the Western world may discourage interventions in ancient art that would alter the

appearance of the original. In the past, ancient artworks were frequently altered during restoration, but this practice has become less common in recent times as the value of preserving the original appearance of the artwork has increased. Thus, Option C is plausible.

Option D: The passage discusses how the idea of an original work of art that cannot be altered developed in the Western world and how this intellectual position has led to different attitudes towards cloning between Europe and Asia. However, the passage does not directly mention that the value placed on an unassailable original has discouraged or influenced attitudes towards human cloning in the Western world.

Hence, Option D is the correct answer.

Instructions [9 - 12]

The passage below is accompanied by a set of questions. Choose the best answer to each question.

Comprehension:

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 Undead are deified in nature's order by giving them divine attributes.
- C The natural attributes of the Undead are rendered abnormal by changing their status.
- D According the Undead an abnormal status is to reject the natural order of things.

Answer: A

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Explanation:

Option A best expresses the claim made in the statement - "In order to confirm their abnormal status, many of the Undead were often accorded attributes, which defied the natural order of things . . ."

The passage states that in order to confirm their abnormal status, the Undead were often given attributes that defied the natural order of

things. This suggests that humans conceptualize the Undead as possessing abnormal features to confirm their abnormal status. This differs from Options B and C, which suggest that the Undead are deified or that their natural attributes are rendered abnormal by changing their status. Option D is also inaccurate, as the passage does not mention that giving the Undead an abnormal status is a rejection of the natural order of things.

Hence, Option A is the correct answer.

10. 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 Mankind's early years were marked by a belief in the existence of eerie creatures that were neither quite alive nor dead.
- B Long ago, eerie creatures used to whisper in the primal darkness that they were not quite dead.
- C Mankind's primal years were marked by creatures alive with eerie whispers, but seen only in the darkness.
- D We can understand the lives of the eerie creatures in Mankind's early years through their whispers in the darkness.

Answer: A

[▶ Video Solution](#)

Explanation:

Option A is a valid conclusion to draw from the lines - "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."

The statement mentions that in Mankind's earliest years, there were whispers of eerie creatures that were not quite alive or dead. This suggests that in these early years, there was a belief in the existence of such creatures. Option A accurately captures this idea. Option B is not a valid conclusion as the given statement does not mention anything about eerie creatures whispering about their own death. Option C is also incorrect since the passage does not mention that the creatures were only seen in the darkness. Similarly, Option D is not a valid conclusion as the given statement offers no information on how we can understand the lives of the eerie creatures.

Hence, Option A is the correct choice.

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11. Which one of the following statements best describes what the passage is about?

- A The writer discusses the transition from primitive thinking to the Age of Enlightenment.
- B The passage discusses the evolution of theories of the Undead from primitive thinking to the Age of Enlightenment.
- C The passage describes the failure of human beings to fully comprehend their environment.
- D The writer describes the ways in which the Undead come to be associated with Shamans and the practice of magic.

Answer: B

[▶ Video Solution](#)

Explanation:

The passage underlines that the concept of the Undead, or creatures that are not quite alive or dead, has always been a part of human folklore. In ancient times, the Undead were ill-defined and vague, but as human societies became more sophisticated, the Undead took on more definite shapes and were often associated with supernatural powers, such as the ability to transform, drink blood, and influence human minds. The Undead have also been connected to the practice of magic, and in more recent times, specific names such as werewolf, vampire, and ghoul have become associated with the concept of the Undead. These names are often used to strike fear into the hearts of ordinary humans. The passage suggests that the Undead have evolved and developed over time, and as human societies have advanced, the Undead have become more defined and have gained more specific attributes. Overall, the passage discusses the

long-standing presence of the Undead in human folklore and the evolution of their portrayal in various cultures. Option B aptly captures the above idea.

Option A is incorrect since the passage does not mention the transition from primitive thinking to the Age of Enlightenment. Option C is also inaccurate as the author does not emphasize the failure of human beings "to fully comprehend their environment" [not the focus]. Option D is not a complete description of the passage since it only mentions one aspect of the passage rather than the overall theme of the evolution of the concept of the Undead.

Hence, Option B is the correct choice.

12. All of the following statements, if false, could be seen as being in accordance with the passage, EXCEPT:

- A the Undead remained vague and ill-defined, even as Mankind strove to understand the horror they inspired.
- 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 relationship between Shamans and the Undead was believed to be a strong and stable one.

Answer: B

▶ Video Solution

Explanation:

The multiple negations indicate that if any of the given statements are false, they could be seen as being consistent with the information provided in the passage [i.e. they do not contradict the information provided in the passage]. Since the question involves "except," we need to find a valid statement based on the information provided [since if this statement is correct, it would not be consistent with the information in the passage].

We notice that Option B is consistent with the information provided in the passage: The passage states that as human societies became more sophisticated, the Undead took on more definite shapes and became more defined. It also mentions that from the Middle Ages and into the Age of Enlightenment, theories of the Undead continued to grow and develop. This suggests that the transition from the Middle Ages to the Age of Enlightenment saw new theories of the Undead. There will be inconsistencies if the statement in B is refuted or incorrect.

If the remaining options are false, they will support the discussion in the passage: Option A is not consistent with the passage as it states that the Undead remained vague and ill-defined, even as human societies strove to understand the horror they inspired, while the passage actually states that the Undead became more defined as human societies became more sophisticated. Option C is also incorrect because the passage does not mention that the growing sophistication of Mankind caused humans to stop believing in the Undead. Similarly, Option D is also inconsistent in its current form since the passage does not mention anything about the strength or stability of the relationship between Shamans and the Undead.

Hence, Option B is the correct choice.

Instructions [13 - 16]

The passage below is accompanied by a set of questions. Choose the best answer to each question.

Comprehension:

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 center 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 labor 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 centers 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.

13. Which one of the following statements best reflects the main argument of the fourth paragraph of the passage?

- A Technology, laws, and customs are comparable, but dissimilar phenomena.
- B Technological environments privilege certain dimensions of human nature as effectively as laws and customs.
- C Automobiles represent the interest in mobility present in human nature.
- D Technology, laws, and customs are not unlike each other if considered as institutions.

Answer: D

▶ Video Solution

Explanation:

The fourth paragraph discusses the ways in which technology shapes society and the values and meanings that are inscribed in technological design. It suggests that technology, like laws and customs, represents the interests of those who use it and shapes the version of human nature that is sanctioned by society. The paragraph compares technology to laws and customs, stating that they are similar in the sense that they are institutions that shape the way people live. Therefore, the correct statement that captures the crux of the fourth paragraph is Option D [Technology, laws, and customs are not unlike each other if considered as institutions].

Option A: While it is true that technology, laws, and customs are comparable phenomena in this sense, the statement does not adequately capture the main point being made in the paragraph.

Option B: is incorrect because it misinterprets the main point of the fourth paragraph. While the paragraph does suggest that technology shapes the version of human nature that is sanctioned by society, it does not directly compare the effectiveness of technological environments and laws and customs in privileging certain dimensions of human nature.

Option C: is only partially true. While the fourth paragraph does mention the idea that technologies represent the interests of those who use them, it does not specifically state that automobiles represent the interest in mobility present in human nature. The paragraph mentions the automobile as an example of a technology that represents its users, but does not explicitly link it to the concept of mobility.

Hence, Option D is the correct choice.

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14. Which one of the following statements could be inferred as supporting the arguments of the passage?

- A It is not human nature, but human culture that is represented by institutions such as law and custom.
- B Technologies form the environmental context and shape the contours of human society.
- C Nature decides the point at which society loses its capacity to control history.
- D The romantic conception of nature referred to by the passage is the one that requires theoretical legitimacy.

Answer: B

Explanation:

The passage specifically states that "critical theory of technology regards technologies as an environment rather than as a collection of tools," and that "technologies shape their inhabitants" in a way that is similar to laws and customs, which represent certain interests and values of those who live under their sway. There is no mention of the role of nature in shaping society or determining the limits of society's control over history, so options C and D cannot be supporting points. The statement in A wouldn't support the discussion in the passage because the author suggests that institutions such as laws and customs represent certain dimensions of human nature rather than human culture.

Hence, Option B is the correct choice.

15. 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 Marx's understanding of the capitalist rationalisation of production and Marcuse's understanding of a "project" of "technological rationality" share theoretical inclinations.
- C Masses are organised in patterns set by Foucault's prisons and Habermas' public sphere.
- D Paradoxically, the capitalist rationalisation of production is a mark of so-called socialist systems as well.

Answer: C

Explanation:

Option A: This statement is consistent with the arguments of the passage, which claim that the pattern of the capitalist rationalization of production arises from the problems of command over a disempowered and deskilled labor force and is present in many different contexts, including the factory and socialist systems.

Option B: This statement is consistent with the passage, which claims that Marx and Marcuse both contribute to the tradition of critical theory of technology, which seeks to understand the ways in which technological systems are shaped by and contribute to the reproduction of social and political hierarchies.

Option C: This statement contradicts an element discussed in the passage. The passage states that the pattern of the capitalist rationalization of production, which is marked by the centralization of power in institutions and organizations and the deskilling of the labor force, arises in many different contexts, including the factory, prisons, and the public sphere. It does not claim that the patterns in these different contexts are set by Foucault's prisons and Habermas' public sphere.

Option D: This statement is consistent with the passage, which claims that the pattern of the capitalist rationalization of production is present in many different contexts, including socialist systems.

Hence, Option C is the correct choice.

16. 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 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.
- C analyses of technologies must engage with their social histories to be able to reveal their implicit and explicit meanings for us.
- D technologies seek to privilege certain dimensions of human nature at a high cost to lived nature.

Answer: D

Explanation:

Option A: The passage states that "laws of property represent the interest in ownership and control. Customs such as parental authority represent the interest of childhood in safety and growth." It then goes on to say that "interests such as these constitute the version of human nature sanctioned by society." This suggests that the concept of human nature is not fixed but rather emerges out of historical context and is shaped by society. Therefore, it can be inferred that the significance of parental authority to children's safety does not imply that parental authority is a permanent aspect of human nature.

Option B: This claim can be inferred - the author states that "critical theory of technology is a political theory of modernity with a normative dimension" and that it belongs to a tradition "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." This suggests that the critical theory of technology argues that as issues of human rights become more prominent, the social order becomes more authoritarian.

Option C: We are told that "a hermeneutics of technology must make explicit the meanings implicit in the devices we use and the rituals they script" and that "social histories of technologies such as the bicycle, artificial lighting or firearms have made important contributions to this type of analysis." This suggests that engaging with the social histories of technologies is necessary to understand their implicit and explicit meanings for us.

Option D: This cannot be inferred from the passage because the passage does not mention any costs or negative consequences of technologies privileging certain dimensions of human nature - it only discusses the idea that technologies represent the interests of their users and shape their behaviour and values; however, no claims are made about the potential negative impacts of this process.

Hence, Option D is the correct choice.

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17. 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

Answer: D

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Explanation:

The sentence would best fit in Blank 4 because it ties together the ideas presented in the paragraph. The paragraph states that people today have access to a vast amount of information, but it is not clear if they are more knowledgeable as a result. It also mentions that the readily available knowledge can lead students away from serious study and towards an inability to write effectively. The missing sentence introduces the idea that the Internet has both positive and negative effects on knowledge and learning. It fits well in Option 4 because it connects to the idea that the Internet has let people choose sources that reinforce their opinions rather than encouraging them to question inherited beliefs, which is the final point presented in the paragraph.

18. 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 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.
- 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 Petitioning has been important to democratic functioning, as it supplements the electoral process by enabling ongoing engagement with the government.
- D 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.

Answer: C

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Explanation:

The given passage discusses the role of petitioning in democratic governance; it highlights how petitioning can shape political agendas, recruit citizens to causes, give voice to the voteless, and apply the discipline of rhetorical argument to clarify points of view. The passage also compares petitioning to elections, stating that petitioning supplements the electoral process and enables ongoing engagement with the government. The author does not make a judgment about the relative superiority of petitioning or elections, but rather focuses on the specific ways in which petitioning can contribute to democratic functioning. Option C accurately summarizes the points discussed above.

Option A is incorrect because the passage does not state that petitioning is "an ideal form of representative democracy." It only mentions that petitioning can give voice to the voteless and apply the discipline of rhetorical argument, but it does not make a broader claim about the superiority of petitioning over other forms of democracy.

Option B is incorrect because the passage does not suggest that citizens are becoming less inclined to petitioning. In fact, the passage does not address the prevalence of petitioning in contemporary times at all.

Option D is incorrect because the passage does not state that petitioning is more representative of the collective voice than elections. It only mentions that petitioning can give voice to the voteless, but it does not make a comparison to elections in this regard. The passage also does not suggest that the functioning of democratic government would necessarily improve if we relied more on petitioning instead of holding periodic elections; it simply states that petitioning has been important to democratic functioning in the past, and that it supplements the electoral process by enabling ongoing engagement with the government.

19. 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

Answer: B

▶ Video Solution

Explanation:

The sentence would best fit Blank 2 because it ties together the ideas presented in the paragraph. The paragraph describes the change in the mindset for wedding celebrations post covid. In the first two lines, the author mentions this mindset. The given sentence will fill the blank 2 as it restates the idea presented in the previous line that many couples are marrying secretly to ease the anxiety and pressure.

Thus, the correct option is B.

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20. 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 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.
- B 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.
- C 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.
- D 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.

Answer: C

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Explanation:

The passage touches upon the historical relationship between Ethiopia and Europe during the medieval period. The traditional narrative of this relationship has portrayed Ethiopia as weak and in need of military assistance from Europe, but recent research has revealed that this narrative is not accurate and that Ethiopia was actually a well-connected and outward-looking culture that engaged in missions of diplomacy, faith, and commerce with Europe. The passage also notes that these new findings challenge historians to re-imagine the connections between Ethiopia and Europe during this period and to consider the role of Ethiopia as a more active participant in these relationships. Option C accurately reflects the main points made in the passage [that the traditional narrative of Ethiopia's relationship with Europe is inaccurate]

Option A is incorrect because it suggests that the connections between Ethiopia and Europe were primarily military and commercial in nature, which is not stated in the passage. Similarly, Option B implies that historians had a mistaken view of Ethiopia's relationship with Europe, which is not stated in the passage. The idea in Option D - which suggests that medieval texts were biased in favour of Europe and against Africa - cannot be understood from the discussion.

Hence, Option C is the correct choice.

21. The four sentences (labelled 1, 2, 3 and 4) below, when properly sequenced, would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the 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.

Answer:2143

[▶ Video Solution](#)

Explanation:

The given set of sentences underlines the relationship between commuting and productivity and how it can impact innovation. The idea is that shorter commutes can support innovation by giving employees more time in the office and opportunities for in-person collaboration, while longer commutes can be physically draining and can lead to decreased productivity. This correlation is first highlighted in statement 2, which sets the context for subsequent discussion. We note that statements 4 and 3 form a logical block since 4 presents an idea [work-from-home scenarios to improve productivity] and 3 extends on it [why the idea in 4 might not be effective]. The marker word 'some' in 4 helps us link it with statement 1, which discusses the opinions of "some company leaders." So 1 puts forth the belief of one group of company leaders, and 4 presents us with the opinion held by a few other company leaders. This allows us to form the logical block: [1-4-3]. We can place 2 at the beginning of this structure to obtain a coherent paragraph. Hence, the correct answer is 2143.

22. The four sentences (labelled 1, 2, 3 and 4) below, when properly sequenced, would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the 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.

Answer:3214

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Explanation:

A brief reading of the sentences suggests that the paragraph is about the applications of the creative element in the world economy. Sentence 3 gives the introduction by contrasting the growth rate of the world economy and the creative industry. Statement 2 follows 3 by stating that the difference will be more if we consider the contribution of the creative element in other industries. Sentence 1 extends this idea by explaining how the creative element in product design can help sustain a competitive advantage. Sentence 4 concludes the paragraph by stating the implications of the application of the creative element mentioned in sentence 1.

Thus, the correct order will be 3-2-1-4.

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

Answer: D

[▶ Video Solution](#)

Explanation:

The passage is about the limitations of our understanding of the universe and how it is connected. It suggests that our understanding of the distinction between animate and inanimate objects may be flawed because of our limited perspective, and that quantum mechanics reveals a different understanding of this distinction; it also suggests that there may be a pattern to the universe that we cannot fully grasp with our brains. Option D correctly captures these points.

Options A and B are incorrect because the passage does not state that the effect of stimuli is similar in inanimate objects compared to living beings or mention astigmatism or an erroneous view of reality. Option C is not understood since the passage does not suggest that inanimate objects are sentient or cognizant; it only highlights that the distinction between animate and inanimate objects disappears at the quantum scale.

Hence, Option D is the correct choice.

24. The four sentences (labelled 1, 2, 3 and 4) below, when properly sequenced, would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the 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.

Answer:2431

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Explanation:

A brief reading of the sentences suggests that the paragraph is about the applications of a structural protein called Collagen. Sentence 2 introduces the paragraph by defining Collagen. 2-4 is an obvious link, as sentence 2 ends by stating that Collagen promotes skin regeneration, and sentence 4 explains why it is not widely used in the medical field despite this. Sentence 3 extends the idea given in sentence 4 by contrasting the bacteria affecting fish skins with human pathogens. Sentence 1 follows sentence 3 by providing the applications of fish skin collagen.

Thus, the correct order will be 2-4-3-1.

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Instructions [25 - 29]

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.

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.

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.

25. How many goals were scored in Match 7?

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

Answer: C

[▶ Video Solution](#)

Explanation:

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 Bimal scored 4 goals and since Harita scored more goals than Bimal 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 Bimal scored will be 5th, 6th and 7th matches as Harita scored in 4th and 8th matches and we get the following table:

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

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

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

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

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

Answer: D

Explanation:

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 Bimal scored 4 goals and since Harita scored more goals than Bimal 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).

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Match-2	1	Amla/Sarita-1
Match-3	1	Amla/Sarita-1
Match-4	1	Harita-1
Match-5	2	Bimal-1, Amla/Sarita-1
Match-6	1	Bimal-1
Match-7	1	Bimal-1
Match-8	1	Harita-1

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

Answer: C

[▶ Video Solution](#)

Explanation:

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 Bimal scored 4 goals and since Harita scored more goals than Bimal 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 Bimal scored will be 5th, 6th and 7th matches as Harita scored in 4th and 8th matches and we get the following table:

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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.

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Match-3	1	Amla/Sarita-1
Match-4	1	Harita-1
Match-5	2	Bimal-1, Amla/Sarita-1
Match-6	1	Bimal-1
Match-7	1	Bimal-1
Match-8	1	Harita-1

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

Answer: A

Explanation:

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 Bimal scored 4 goals and since Harita scored more goals than Bimal 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 Bimal scored will be 5th, 6th and 7th matches as Harita scored in 4th and 8th matches and we get the following table:

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

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Match-3	1	
Match-4	1	Harita-1
Match-5	2	Bimal-1,
Match-6	1	Bimal-1
Match-7	1	Bimal-1
Match-8	1	Harita-1

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

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

Know the CAT Percentile Required for IIM Calls

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

Answer: B

[▶ Video Solution](#)

Explanation:

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 Bimal scored 4 goals and since Harita scored more goals than Bimal 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 Bimal scored will be 5th, 6th and 7th matches as Harita scored in 4th and 8th matches and we get the following table:

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

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

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

Instructions [30 - 34]

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.

30. How many boys are there in the class?

Answer:50

[▶ Video Solution](#)

Explanation: 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

$$2 \leq 0.18x - 4 \leq 6$$

$$6 \leq 0.18x \leq 10$$

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.

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

From statement 5, we can say that,

$$4 + 0.4a - b = 5 + b + 1$$

$$\text{or, } 0.4a = 2 + 2b$$

$$\text{or, } a = 5(1+b)$$

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 (40)	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

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

Answer: C

[▶ Video Solution](#)

Explanation: 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

$$2 \leq 0.18x - 4 \leq 6$$

$$6 \leq 0.18x \leq 10$$

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.

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

From statement 5, we can say that,

$$4 + 0.4a - b = 5 + b + 1$$

$$\text{or, } 0.4a = 2 + 2b$$

$$\text{or, } a = 5(1+b)$$

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 (40)	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

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

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

Answer: B

▶ Video Solution

Explanation: 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

$$2 \leq 0.18x - 4 \leq 6$$

$$6 \leq 0.18x \leq 10$$

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.

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

From statement 5, we can say that,

$$4 + 0.4a - b = 5 + b + 1$$

$$\text{or, } 0.4a = 2 + 2b$$

$$\text{or, } a = 5(1+b)$$

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 (40)	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

Total students interested in 2-day event = $30+5 = 35$

Total students = $15 + 50 = 65$

Fraction = $\frac{35}{65} = \frac{7}{13}$

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

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

Answer: A

▶ Video Solution

Explanation: 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

$$2 \leq 0.18x - 4 \leq 6$$

$$6 \leq 0.18x \leq 10$$

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.

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

From statement 5, we can say that,

$$4 + 0.4a - b = 5 + b + 1$$

$$\text{or, } 0.4a = 2 + 2b$$

$$\text{or, } a = 5(1+b)$$

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 (40)	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

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

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

Answer: C

[▶ Video Solution](#)

Explanation: 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

$$2 \leq 0.18x - 4 \leq 6$$

$$6 \leq 0.18x \leq 10$$

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.

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

From statement 5, we can say that,

$$4 + 0.4a - b = 5 + b + 1$$

$$\text{or, } 0.4a = 2 + 2b$$

$$\text{or, } a = 5(1+b)$$

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 (40)	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

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Instructions [35 - 39]

Comprehension:

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 Rs. $1000 \times (2 \times 5 \times 7) =$ 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.

35. How many tokens did Qahira receive?

Answer:2

[▶ Video Solution](#)

Explanation:

Amount(in 000s)	Tokens Received	Person
390	2,3,5,13	
210	2,3,5,7	
165	3,5,11	
77	7,11	
66	2,3,11	

From statement 1 we can deduce that Fatima gave token 3 and Adhara gave token 13 and therefore from this we can say that Qahira received a funding of 77,000 and Pragnyaa received a funding of 390,000.

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 received a token from Esther so we can also conclude that Esther gave the token number 11.

Amount(in 000s)	Tokens Received	Person
390	2,3,5,13	Pragnyaa
210	2,3,5,7	Rashida
165	3,5,11	
77	7,11	Qahira
66	2,3,11	

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.

Amount(in 000s)	Tokens Received	Person
390	2,3,5,13	Pragnyaa
210	2,3,5,7	Rashida
165	3,5,11	Smera/Tantra
77	7,11	Qahira
66	2,3,11	Smera/Tantra

Person	Token
Adhara	13
Bithi	2/5
Chhaya	5/2
Dhanavi	7
Esther	11
Fathima	3

Alternate Explanation:

$$390 = 2 \times 3 \times 5 \times 13$$

$$210 = 2 \times 3 \times 5 \times 7$$

$$165 = 3 \times 5 \times 11$$

$$77 = 7 \times 11$$

$$66 = 2 \times 3 \times 11$$

From the above information we can conclude that the number of times a particular token was given, therefore we get the following table,

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 received a token from Esther so we can also conclude that Esther gave the token number 11.

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

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

36. Who among the following definitely received a token from Bithi but not from Dhanavi?

- A** Pragnyaa
- B** Rasheeda
- C** Qahira
- D** Tantra

Answer: A

[▶ Video Solution](#)

Explanation:

Amount(in 000s)	Tokens Received	Person
390	2,3,5,13	
210	2,3,5,7	
165	3,5,11	
77	7,11	
66	2,3,11	

From statement 1 we can deduce that Fatima gave token 3 and Adhara gave token 13 and therefore from this we can say that Qahira received a funding of 77,000 and Pragnyaa received a funding of 390,000.

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 received a token from Esther so we can also conclude that Esther gave the token number 11.

Amount(in 000s)	Tokens Received	Person
390	2,3,5,13	Pragnyaa
210	2,3,5,7	Rashida
165	3,5,11	
77	7,11	Qahira
66	2,3,11	

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.

Amount(in 000s)	Tokens Received	Person
390	2,3,5,13	Pragnyaa
210	2,3,5,7	Rashida
165	3,5,11	Smera/Tantra
77	7,11	Qahira
66	2,3,11	Smera/Tantra

Person	Token
Adhara	13
Bithi	2/5
Chhaya	5/2
Dhanavi	7
Esther	11
Fathima	3

Alternate Explanation:

$$390 = 2 \times 3 \times 5 \times 13$$

$$210 = 2 \times 3 \times 5 \times 7$$

$$165 = 3 \times 5 \times 11$$

$$77 = 7 \times 11$$

$$66 = 2 \times 3 \times 11$$

From the above information we can conclude that the number of times a particular token was given, therefore we get the following table,

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 received a token from Esther so we can also conclude that Esther gave the token number 11.

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

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

37. How many tokens did Chhaya award?

Answer:3

[Video Solution](#)

Explanation:

Amount(in 000s)	Tokens Received	Person
390	2,3,5,13	
210	2,3,5,7	
165	3,5,11	
77	7,11	
66	2,3,11	

From statement 1 we can deduce that Fatima gave token 3 and Adhara gave token 13 and therefore from this we can say that Qahira

received a funding of 77,000 and Pragnyaa received a funding of 390,000.

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 received a token from Esther so we can also conclude that Esther gave the token number 11.

Amount(in 000s)	Tokens Received	Person
390	2,3,5,13	Pragnyaa
210	2,3,5,7	Rashida
165	3,5,11	
77	7,11	Qahira
66	2,3,11	

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.

Amount(in 000s)	Tokens Received	Person
390	2,3,5,13	Pragnyaa
210	2,3,5,7	Rashida
165	3,5,11	Smera/Tantra
77	7,11	Qahira
66	2,3,11	Smera/Tantra

Person	Token
Adhara	13
Bithi	2/5
Chhaya	5/2
Dhanavi	7
Esther	11
Fathima	3

Alternate Explanation:

$$390 = 2 \times 3 \times 5 \times 13$$

$$210 = 2 \times 3 \times 5 \times 7$$

$$165 = 3 \times 5 \times 11$$

$$77 = 7 \times 11$$

$$66 = 2 \times 3 \times 11$$

From the above information we can conclude that the number of times a particular token was given, therefore we get the following table,

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 received a token from Esther so we can also conclude that Esther gave the token number 11.

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

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

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38. How many tokens did Smera receive?

Answer:3

[▶ Video Solution](#)

Explanation:

Amount(in 000s)	Tokens Received	Person
390	2,3,5,13	
210	2,3,5,7	
165	3,5,11	
77	7,11	
66	2,3,11	

From statement 1 we can deduce that Fatima gave token 3 and Adhara gave token 13 and therefore from this we can say that Qahira received a funding of 77,000 and Pragnyaa received a funding of 390,000.

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 received a token from Esther so we can also conclude that Esther gave the token number 11.

Amount(in 000s)	Tokens Received	Person
390	2,3,5,13	Pragnyaa
210	2,3,5,7	Rashida
165	3,5,11	
77	7,11	Qahira
66	2,3,11	

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.

Amount(in 000s)	Tokens Received	Person
390	2,3,5,13	Pragnyaa
210	2,3,5,7	Rashida
165	3,5,11	Smera/Tantra
77	7,11	Qahira
66	2,3,11	Smera/Tantra

Person	Token
Adhara	13
Bithi	2/5
Chhaya	5/2
Dhanavi	7
Esther	11
Fathima	3

Alternate Explanation:

$$390 = 2 \times 3 \times 5 \times 13$$

$$210 = 2 \times 3 \times 5 \times 7$$

$$165 = 3 \times 5 \times 11$$

$$77 = 7 \times 11$$

$$66 = 2 \times 3 \times 11$$

From the above information we can conclude that the number of times a particular token was given, therefore we get the following table,

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 received a token from Esther so we can also conclude that Esther gave the token number 11.

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

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

39. Which of the following could be the amount of funding that Tantra received?
(a) Rs. 66,000
(b) Rs. 165,000

- A** Neither (a) nor (b)
B Only (b)
C Only (a)
D Both (a) and (b)

Answer: D

[▶ Video Solution](#)

Explanation:

Amount(in 000s)	Tokens Received	Person
390	2,3,5,13	
210	2,3,5,7	
165	3,5,11	
77	7,11	
66	2,3,11	

From statement 1 we can deduce that Fatima gave token 3 and Adhara gave token 13 and therefore from this we can say that Qahira received a funding of 77,000 and Pragnyaa received a funding of 390,000.

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 received a token from Esther so we can also conclude that Esther gave the token number 11.

Amount(in 000s)	Tokens Received	Person
390	2,3,5,13	Pragnyaa
210	2,3,5,7	Rashida
165	3,5,11	
77	7,11	Qahira
66	2,3,11	

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.

Amount(in 000s)	Tokens Received	Person
390	2,3,5,13	Pragnyaa
210	2,3,5,7	Rashida
165	3,5,11	Smera/Tantra
77	7,11	Qahira
66	2,3,11	Smera/Tantra

Person	Token
Adhara	13
Bithi	2/5
Chhaya	5/2
Dhanavi	7
Esther	11
Fathima	3

Alternate Explanation:

$$390 = 2 \times 3 \times 5 \times 13$$

$$210 = 2 \times 3 \times 5 \times 7$$

$$165 = 3 \times 5 \times 11$$

$$77 = 7 \times 11$$

$$66 = 2 \times 3 \times 11$$

From the above information we can conclude that the number of times a particular token was given, therefore we get the following table,

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.

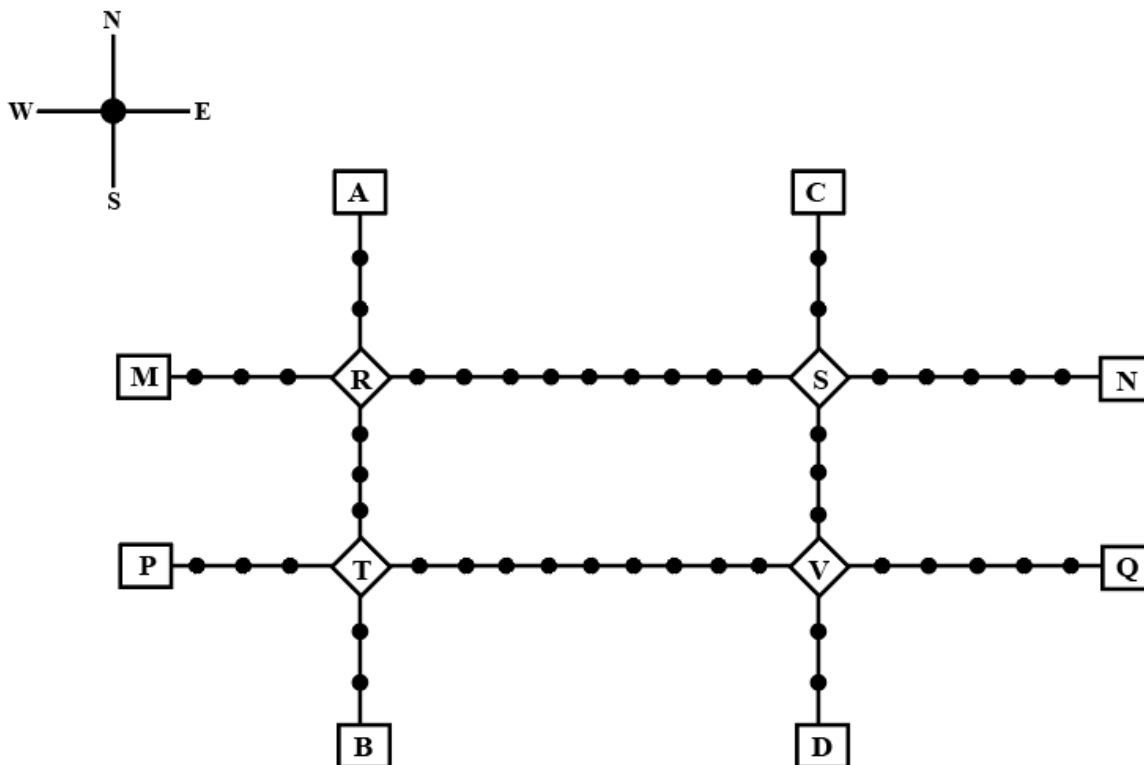
From statement 2, we know that Rashida received highest number of tokens and we already concluded that Pragnyaa received a funding of 390,000 so we can say that Rashida received a funding of 210,000. Rashida did not received a token from Esther so we can also conclude that Esther gave the token number 11.

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

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

Instructions [40 - 44]



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.)

40. 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 9:11 am
- B 9:06 am
- C 9:01 am
- D 9:13 am

Answer: A

[▶ Video Solution](#)

Explanation:

In the east-west direction, a train starts from station M every 10 minutes.

So the earliest by which Hari can catch a train from station M is 8:10 am.

Now there are 19 stations between M and N, out of which two stations are junctions.

Time taken to travel between two stations in the east-west direction is 2 minutes.

Therefore, the time for which the train was running between M and N (excluding the stoppage time) = $20 \times 2 = 40$ minutes

Stoppage time at a junction is 2 minutes, while at the rest of the stations, it is 1 minute each.

Stoppage time for the train running between M and N = $(17 \times 1) + (2 \times 2) = 21$ minutes

Therefore, total travel time = $40 + 21 = 61$ minutes.



CAT SYLLABUS PDF

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41. 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 11:22 am
- C 11:07 am
- D 11:28 am

Answer: A

[▶ Video Solution](#)

Explanation:

Priya can reach S from T via R or V.

In the east-west direction, the first train from P arrives at T at time = 6 am + $(4 \times 2) + (3 \times 1) = 11$ minutes = 6:11 am

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

Since every 10 minutes, a train starts from P in the east-west direction so the latest by which Priya will be able to board such a train is at 10:33 am.

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

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

Since every 15 minutes a train starts from P in the east-west direction so the latest by which Priya will be able to board such a train is at 10:28 am.

Now since she will be able to board a north-south train earlier than the east-west train so Priya will board a train for R from T at 10:28 am.

There are 3 stations between T and R

Travelling time between T and R = $(4 \times 3) + ((3 \times 1)) = 15$ minutes

Therefore, Priya will reach R latest by 10:43 am

In the east-west direction, the first train from M arrives at R at time = 6 am + $(4 \times 2) + (3 \times 1) = 11$ minutes = 6:11 am

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

Since every 10 minutes, a train starts from M in the east-west direction, so the latest by which Priya will be able to board such a train is at 10:43 am.

There are 9 stations between R and S

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

Time by which she reaches S = 10:43 + 29 minutes = 11:12 am

If Priya boards a east-west train then Priya will board a train for V from T at 10:33 am.

There are 9 stations between T and V

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

Therefore, Priya will reach V latest by 10:33 am + 29 minutes = 11:02 am

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

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

Since every 15 minutes, a train starts from M in the north-south direction, so the latest by which Priya will be able to board such a train from V is at 11:03 am.

There are 3 stations between V and S

Travelling time between R and S = $(4 \times 3) + ((3 \times 1)) = 15$ minutes

Time by which she reaches S = 11:03 + 15 minutes = 11:18 am

42. 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 11:49 am
C 11:35 pm
D 11:43 pm

Answer: A

[▶ Video Solution](#)

Explanation:

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.

43. What is the minimum number of trains that are required to provide the service on the AB line (considering both north and south directions)?

Answer: 8

[▶ Video Solution](#)

Explanation:

Travel time between A and B = $(10 \times 3) + (7 \times 1) + (2 \times 2) = 41$ minutes

After completing a journey, a train must rest for 15 minutes at least before starting again.

So if a train starts from 6 am from A to B, then the latest by which that train will start from B to A will be at 7 am, as in the north-south direction, a train starts from A and B every 15 minutes.

So the total no. of trains required = $\left(\frac{60}{15}\right) \times 2 = 8$

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44. What is the minimum number of trains that are required to provide the service in this city?

Answer:48

[▶ Video Solution](#)

Explanation:

Travel time between A and B = $(10 \times 3) + (7 \times 1) + (2 \times 2) = 41$ minutes

After completing a journey, a train must rest for 15 minutes at least before starting again.

So if a train starts from 6 am from A to B, then the latest by which that train will start from B to A will be at 7 am, as in the north-south direction, a train starts from A and B every 15 minutes.

So the total no. of trains required for the north-south lines = $\left(\frac{60}{15}\right) \times 2 \times 2 = 16$

Travel time between M and N = $(20 \times 2) + (17 \times 1) + (2 \times 2) = 61$ minutes

After completing a journey, a train must rest for 15 minutes at least before starting again.

So if a train starts from 6 am from M to N, then the latest by which that train will start from N to M will be at 7:20 am, as in the east-west direction, a train starts from M and N every 15 minutes.

So the total no. of trains required for the east-west lines = $\left(\frac{80}{10}\right) \times 2 \times 2 = 32$

Total no. of trains required to service the city = $16 + 32 = 48$

About CAT exam

Quant

45. 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

Answer:43200

[▶ Video Solution](#)

Explanation:

In the question, it is given that the ratio of number of literate males to literate females is 2 : 3.

Given, the number of literate males = 3600

The number of literate females = $\frac{3600}{2} \times 3 = 5400$

Males : Females = 5 : 4

Let the number of males be 5y and the number of females be 4y

Illiterate males = 5y - 3600

Illiterate females = 4y - 5400

It is given,

$$\frac{5y-3600}{4y-5400} = \frac{4}{3}$$

$$15y - 10800 = 16y - 21600$$

$$y = 10800$$

$$\text{Number of females} = 4y = 4 \times 10800 = 43200$$

Important Verbal Ability Questions for CAT (Download PDF)

46. 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

Answer: C

[▶ Video Solution](#)

Explanation:

Let the original number of students be 'n' whose average weight is 'x'

Let the number of students added be 'm' and the average weight will be $x + 3$

We need to find the value of $n : m$

It is given, average weight of students in a class increased by 0.6 after new students are added.

Therefore,

$$\frac{nx + m(x+3)}{n+m} = x + 0.6$$

$$nx + mx + 3m = mx + nx + 0.6n + 0.6m$$

$$2.4m = 0.6n$$

$$4m = n$$

$$\frac{n}{m} = \frac{4}{1}$$

The answer is option C.

47. 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 9
- B 4
- C 7
- D 8

Answer: C

[▶ Video Solution](#)

Explanation:

It is given,

$$S_n = 2n^2 + n$$

$$S_{n-1} = 2(n-1)^2 + (n-1)$$

$$S_{n-1} = 2n^2 - 3n + 1$$

$$T_n = S_n - S_{n-1} = 2n^2 + n - 2n^2 + 3n - 1 = 4n - 1$$

$$T_n = 4n - 1$$

The terms are 3, 7, 11, 15, 19, 23, 27,

27 is the first term in the series divisible by 9.

27 is the 7th term.

Therefore, the least possible value of n is 7.

The answer is option C.

48. 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 25

B 100

C 50

D 0

Answer: C

[▶ Video Solution](#)

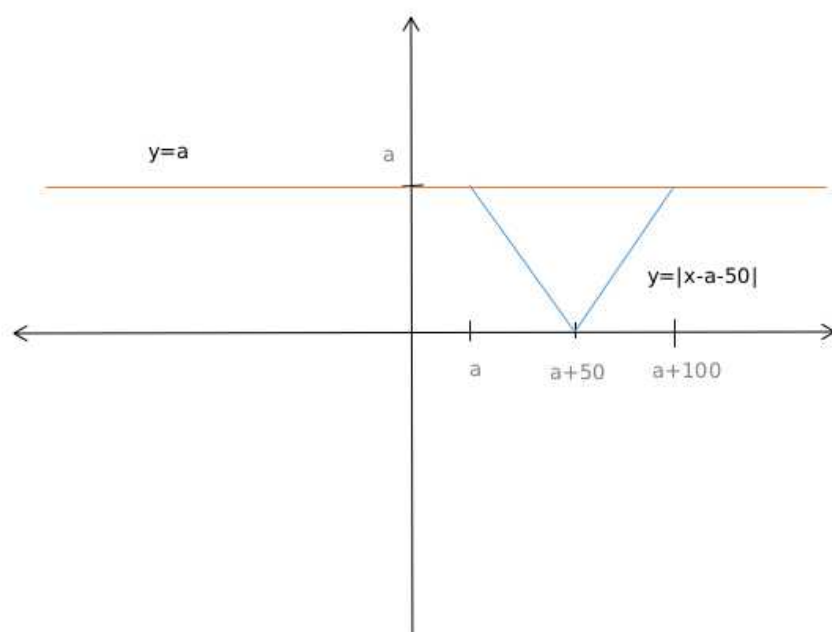
Explanation:

$x > a$, so $|x - a| = x - a$

$x < 100$, so $|x - 100| = 100 - x$

$f(x) = (x - a) + (100 - x) + |x - a - 50| = 100$

or, $|x - a - 50| = a$



From the graph we can see that when $x = a$ then

$|x - a - 50| = a$

or, $a = 50$

Similarly when $x = a + 100$

$|x - a - 50| = a$

or, $a = 50$

So value of a is 50 when $f(x)$ is 100.

49. 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 6
B 15
C 10
D 12

Answer: B

[Video Solution](#)

Explanation:



M - First meeting point

Let the speeds of trains A and B be 'a' and 'b', respectively.

$$\frac{x}{a} = \frac{D-x}{b}$$

It is given,

$$\frac{D}{a} = 10 \text{ and } \frac{x}{b} = 9$$

$$\frac{D}{10} = \frac{D-x}{9}$$

$$\frac{10x}{D} = \frac{9D-9x}{x}$$

$$10x^2 = 9D^2 - 9Dx$$

$$10x^2 + 9Dx - 9D^2 = 0$$

$$\text{Solving, we get } x = \frac{3D}{5}$$

$$\frac{x}{b} = 9$$

$$\frac{3D}{b \times 5} = 9$$

$$\frac{D}{b} = 15$$

The total time taken by train B to travel from station Y to station X is 15 minutes.

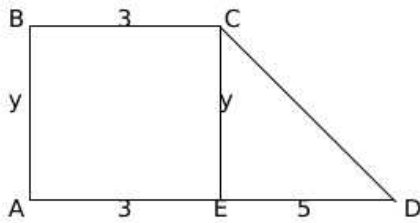
The answer is option B

50. A trapezium $ABCD$ has side AD parallel to BC , $\angle BAD = 90^\circ$, $BC = 3$ cm and $AD = 8$ cm. If the perimeter of this trapezium is 36 cm, then its area, in sq. cm, is

Answer: 66

[Video Solution](#)

Explanation:



$$CD = \sqrt{y^2 + 25}$$

$$11 + y + \sqrt{y^2 + 25} = 36$$

$$\sqrt{y^2 + 25} = 25 - y$$

$$y^2 + 25 = 25^2 + y^2 - 50y$$

$$2y = 24$$

$$y = 12$$

$$\text{Area of trapezium} = 3y + \frac{5y}{2} = \frac{11y}{2} = \frac{11}{2} (12) = 66$$

51. 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 ₹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 ₹744. Then the amount, in rupees, that she had spent in buying almonds is

A 1680

B 1176

C 2520

D 1440

Answer: A

[Video Solution](#)

Explanation:

It is given,

$7C = 30P = 9A$ and Ankita bought 4C, 14P and 6A.

Let $7C = 30P = 9A = 630k$

$C = 90k$, $P = 21k$, and $A = 70k$

Cost price of 4C, 14P and 6A = $4(90k) + 14(21k) + 6(70k) = 1074k$

Marked up price = $1074k + 1752$

$$S.P = \frac{1}{6} (1074k + 1752) + \left(\frac{4}{5}\right) \left(\frac{5}{6}\right) (1074k + 1752) = \frac{5}{6} (1074k + 1752)$$

$S.P - C.P = \text{profit}$

$$1460 - \frac{1074k}{6} = 744$$

$$\frac{1074k}{6} = 716$$

$$k = 4$$

Money spent on buying almonds = $420k = 420 \times 4 = \text{Rs } 1680$

The answer is option A.

How to prepare for Logical Reasoning for CAT

52. 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

Answer: 82

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Explanation:

A is the HCF of $3^k + 4^k + 5^k$ for different values of k.

For k = 1, value is 12

For k = 2, value is 50

For k = 3, value is 216

HCF is 2. Therefore, A = 2

$$4^k + 3(4^k) + 4^{k+2} = 4^k(1 + 3) + 4^{k+2} = 4^{k+1} + 4^{k+2} = 4^{k+1}(1 + 4) = 5 \cdot 4^{k+1}$$

HCF of the values is when k = 1, i.e. $5 \cdot 16 = 80$

Therefore, B = 80

A + B = 82

53. 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 set of all positive integers
- B the set of all integers
- C either the empty set or the set of all integers
- D the empty set

Answer: C

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Explanation:

$b^2 < 4ac$ means that the discriminant is less than 0. Therefore, $f(x) > 0$ for all x if the coefficient of x^2 is positive, and $f(x) < 0$ for all x if the coefficient of x^2 is negative.

We are given that $f(m) < 0$ and m is an integer.

So the set containing values of m will either be empty if the coefficient of x^2 is positive, or it will be a set of all integers if the coefficient of x^2 is negative.

54. 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

Answer: 84

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Explanation:

Let the number of balloons each child received be 2a, 2b, 2c and 2d

$$2a + 2b + 2c + 2d = 20$$

$$a + b + c + d = 10$$

Each of them should get more than zero balloons.

Therefore, total number of ways = $(n - 1)C_{r-1} = (10 - 1)C_{4-1} = 9C_3 = 84$

Data Interpretation for CAT Questions (download pdf)

55. Let a and b be natural numbers. If $a^2 + ab + a = 14$ and $b^2 + ab + b = 28$, then $(2a + b)$ equals

- A 8
- B 7
- C 10
- D 9

Answer: A

[Video Solution](#)

Explanation:

$$a(a + b + 1) = 14 \dots\dots (1)$$

$$b(a + b + 1) = 28 \dots\dots (2)$$

$$\frac{a}{b} = \frac{1}{2}$$

$$b = 2a$$

Substituting in (1), we get

$$a(3a + 1) = 14$$

$$3a^2 + a - 14 = 0$$

$$3a^2 - 6a + 7a - 14 = 0$$

$$3a(a - 2) + 7(a - 2) = 0$$

Given, a and b are natural numbers.

Therefore, $a = 2$ and $b = 4$

$$2a + b = 2(2) + 4 = 8$$

The answer is option A.

56. 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 ₹ 308.32 per kg and makes an overall profit of 64%. Then, Amal's cost price for syrup, in rupees per kg, is

Answer:160

[Video Solution](#)

Explanation:

Total syrup - 110 kg

Total juice - 120 kg

It is given, cost price of syrup is 20% less than the cost price of juice.

Let the cost price of juice per kg be 10CP

Cost price of syrup per kg is 8CP

10kg syrup -> cost price = 80CP

It is given, 10kg syrup is sold at 10% profit. This implies selling price = $1.1 \times 80\text{CP} = 88\text{CP}$

20kg juice \rightarrow cost price = 200CP

It is given, 20kg juice is sold at 20% profit. This implies selling price = $1.2 \times 200\text{CP} = 240\text{CP}$

It is given, Mixing the remaining juice and syrup, Amal sells the mixture at ₹ 308.32 per kg

Selling price of the remaining mixture = $308.32 \times 200 = \text{Rs } 61664$

Total S.P = $61664 + 328\text{CP}$

Total C.P = $880\text{CP} + 1200\text{CP} = 2080\text{CP}$

Overall profit = 64%

$$61664 + 328\text{CP} = \frac{164}{100} (2080\text{CP})$$

Solving, we get CP = 20

Cost price for syrup per kg = 8CP = $8 \times 20 = \text{Rs } 160$

57. 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 $\frac{P^2}{16} - R^2$

B $\frac{P^2}{8} - 2R^2$

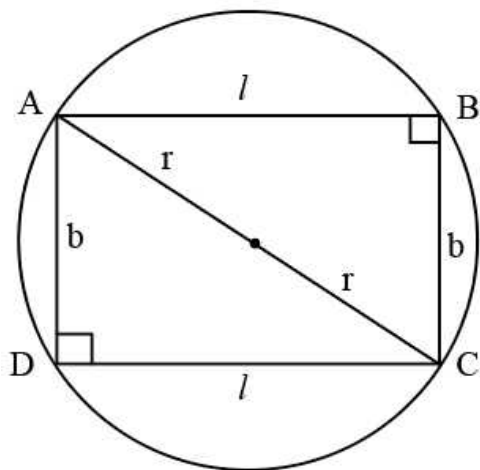
C $\frac{P^2}{2} - 2PR$

D $\frac{P^2}{8} - \frac{R^2}{2}$

Answer: B

▶ Video Solution

Explanation:



$$A = lb$$

$$l^2 + b^2 = 4r^2$$

$$P = 2(l + b)$$

$$\frac{P}{2} = l + b$$

Squaring on both the sides, we get

$$\frac{P^2}{4} = l^2 + b^2 + 2lb$$

$$\frac{P^2}{4} = 4r^2 + 2lb$$

$$\frac{P^2}{8} - 2r^2 = lb$$

The answer is option B.

Logical Reasoning for CAT Questions (download pdf)

58. 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 4
- C 5
- D 1

Answer: C

[▶ Video Solution](#)

Explanation:

It is given that average of three numbers is 13.

$$\text{Sum} = 3 \times 13 = 39$$

It is given, $\frac{39+n}{4}$ is a odd number.

Minimum value $\frac{39+n}{4}$ can take such that n is a natural number is 11

$$\frac{39+n}{4} = 11$$

$$n = 5$$

The answer is option C.

59. 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

Answer: D

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Explanation:

Lemon juice : sugar syrup in the mixture is 1:1, i.e. 50% Lemon juice and 50% sugar syrup.

In sugar syrup, 100% is sugar syrup.

These two are mixed in the ratio 1:3.

$$\text{Lemon juice} = \frac{1(50\%)}{1+3}$$

$$\text{Sugar syrup} = \frac{1(50\%)+3(100\%)}{1+3} = \frac{350}{4}$$

$$\text{Required ratio} = 50:350 = 1:7$$

The answer is option D.

60. 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

Answer: C

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Explanation:

In the question, it is given that the equation $|x + a| + |x - 1| = 2$ has an infinite number of solutions for any value of x . This is possible when x in $|x+a|$ and x in $|x-1|$ cancels out.

Case 1:

$$x + a < 0, x - 1 \geq 0$$

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

$$a = -3$$

Case 2:

$$x + a \geq 0 \text{ and } x - 1 < 0$$

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

$$a = 1$$

Largest value of a is 1.

The answer is option C.

Quantitative Aptitude for CAT Questions (download pdf)

61. 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** 47
B 53
C 52
D 48

Answer: A

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Explanation:

Let n , s , d and t be the number of students who likes none of the drinks, exactly one drink, exactly 2 drinks and all three drinks, respectively.

It is given,

$$n + s + d + t = 100 \dots\dots (1)$$

$$s + 2d + 3t = 73 + 80 + 52$$

$$s + 2d + 3t = 205 \dots\dots (2)$$

(2)-(1), we get

$$d + 2t - n = 105$$

Maximum value t can take is 52, i.e. $t = 52$, $d = 1$ and $n = 0$

Minimum value t can take is 5, i.e. $t = 5$, $d = 95$ and $n = 0$ (This also satisfies equation (1))

Difference = $52 - 5 = 47$

The answer is option A.

62. 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 (4, 5)

C (-3, 4)

D (-4, 5)

Answer: D

[▶ Video Solution](#)

Explanation:

In a parallelogram, two diagonals of parallelogram bisect each other, which concludes that mid-point of both diagonals are the same.

Midpoint of AC = $\left(\frac{1+(-2)}{2}, \frac{1+8}{2} \right)$

Let the coordinates of vertex D be (x,y)

$\left(\frac{x+3}{2}, \frac{y+4}{2} \right) = \left(\frac{1+(-2)}{2}, \frac{1+8}{2} \right)$

$x = -4$ and $y = 5$

The answer is option D.

63. For natural numbers x , y , and z , if $xy + yz = 19$ and $yz + xz = 51$, then the minimum possible value of xyz is

Answer:34

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Explanation:

It is given, $y(x + z) = 19$

y cannot be 19.

If $y = 19$, $x + z = 1$ which is not possible when both x and z are natural numbers.

Therefore, $y = 1$ and $x + z = 19$

It is given, $z(x + y) = 51$

z can take values 3 and 17

Case 1:

If $z = 3$, $y = 1$ and $x = 16$

$xyz = 3 \cdot 1 \cdot 16 = 48$

Case 2:

If $z = 17$, $y = 1$ and $x = 2$

$xyz = 17 \cdot 1 \cdot 2 = 34$

Minimum value xyz can take is 34.

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64. 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 37.5%
- B 62.5%
- C 60%
- D 40%

Answer: A

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Explanation:

Let the savings invested in first part and second part be 'x' and 'y', respectively.

It is given,

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

$$60x = 36y$$

$$5x = 3y$$

$$\text{Required percentage} = \frac{x}{x+y} \times 100 = \frac{3}{3+5} \times 100 = 37.5\%$$

The answer is option A.

65. 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

Answer:111

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Explanation:

Let the number of persons standing ahead and behind of Pinky be 3a and 5a.

$$\text{Total number of persons} = 3a + 5a + 1(\text{including pinky}) = 8a + 1$$

$$8a + 1 < 300$$

$$8a < 300$$

$$a < 37.5$$

Maximum value a can take is 37.

$$\text{The maximum possible number of persons standing ahead of Pinky} = 3a = 3 \times 37 = 111$$

66. 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

Answer:44

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Explanation:

It is given,

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

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

For $n = 1$ to $n = 19$, value of function is zero.

For $n = 20$ to $n = 44$, value of function will be 1.

$$44 = 20 + n - 1$$

$n = 25$ which is equal to given value.

This implies $N = 44$

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