

**Directions of Test**

Test Name	Actual CAT 2022 Slot I	Total Questions	66	Total Time	120 Mins
Section Name	No. of Questions	Time limit	Marks per Question	Negative Marking	
Verbal Ability	24	0:40(h:m)	3	1/3	
DI & Reasoning	20	0:40(h:m)	3	1/3	
Quantitative Ability	22	0:40(h:m)	3	1/3	

Section : Verbal Ability

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

Question No. : 1

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.

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

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

Question No. : 2



All of the following claims can be inferred from the passage, EXCEPT:

- A) the significance of parental authority to children's safety does not therefore imply that parental authority is a permanent aspect of human nature.
- B) analyses of technologies must engage with their social histories to be able to reveal their implicit and explicit meanings for us.
- C) technologies seek to privilege certain dimensions of human nature at a high cost to lived nature
- D) the critical theory of technology argues that, as issues of human rights become more prominent, we lose sight of the ways in which the social order becomes more authoritarian.

Question No. : 3

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

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

Question No. : 4

Which one of the following statements contradicts the arguments of the passage?

- A) The problems of command over a disempowered and deskilled labour force gave rise to similar patterns of the capitalist rationalisation of production wherever masses were organised.
- B) Paradoxically, the capitalist rationalisation of production is a mark of so-called socialist systems as well.
- C) Masses are organised in patterns set by Foucault's prisons and Habermas' public sphere.
- D) Marx's understanding of the capitalist rationalisation of production and Marcuse's understanding of a "project" of "technological rationality" share theoretical inclinations.

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

Question No. : 5

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.

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

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

Question No. : 6

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

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

Question No. : 7

"Through meditation and the right attitude, one allows emotions to happen to oneself (it is impossible to prevent this), but one is advised to observe the emotions without necessarily acting on them; one achieves some distance and decides what has value and what does not have value." In the context of the passage, which one of the following is not a possible implication of the quoted statement?

- A) "Meditation and the right attitude", in this instance, implies an initially passive reception of all experiences.
- B) The observation of emotions in a distant manner corresponds to the second movement referred to earlier in the passage.
- C) Emotional responses can make it difficult to distinguish valuable experiences from valueless experiences.
- D) Meditation allows certain out-of-body experiences that permit us to gain the distance necessary to control our emotions.

Question No. : 8

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

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

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

Question No. : 9

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.

“In order to confirm their abnormal status, many of the Undead were often accorded attributes, which defied the natural order of things . . .” Which one of the following best expresses the claim made in this statement?

- A) Human beings conceptualise the Undead as possessing abnormal features.
- B) The natural attributes of the Undead are rendered abnormal by changing their status.
- C) The Undead are deified in nature’s order by giving them divine attributes.
- D) According to the Undead an abnormal status is to reject the natural order of things.

Question No. : 10

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

- A) the relationship between Shamans and the Undead was believed to be a strong and stable one.
- B) the transition from the Middle Ages to the Age of Enlightenment saw new theories of the Undead.
- C) the growing sophistication of Mankind meant that humans stopped believing in the Undead.
- D) the Undead remained vague and ill-defined, even as Mankind strove to understand the horror they inspired.

Question No. : 11

Which one of the following observations is a valid conclusion to draw from the statement, “From out of the primal darkness of Mankind’s earliest years, come whispers of eerie creatures, not quite alive (or alive in a way which we can understand), yet not quite dead either.”?

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

Question No. : 12

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

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

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

Question No. : 13

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.'

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

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

Question No. : 14

The value that the modern West assigns to "an unassailable original" has resulted in all of the following EXCEPT:

- A) it discourages them from simultaneous displays of multiple copies of a painting.
- B) it discourages them from making interventions in ancient art.
- C) it allows regular employment for certain craftsmen.
- D) it discourages them from carrying out human cloning

Question No. : 15

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

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

Question No. : 16

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

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

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

Question No. : 17

Petitioning is an expeditious democratic tradition, used frequently in prior centuries, by which citizens can bring issues directly to governments. As expressions of collective voice, they support procedural democracy by shaping agendas. They can also recruit citizens to causes, give voice to the voteless, and apply the discipline of rhetorical argument that clarifies a point of view. By contrast, elections are limited in several respects: they involve only a few candidates, and thus fall far short of a



representative democracy. Further, voters' choices are not specific to particular policies or laws, and elections are episodic, whereas the voice of the people needs to be heard and integrated constantly into democratic government.

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

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

Question No. : 18

- 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.

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

Question No. : 19

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

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

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

Question No. : 20

- 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.

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

**Question No. : 21**

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.

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

Question No. : 22

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

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

Question No. : 23

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

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

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

Question No. : 24

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

Section : DI & Reasoning

DIRECTIONS for the question: Read the information given below and answer the question that follows.

Question No. : 25

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

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

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

How many goals were scored in Match 7?

A) 1 B) 2 C) 3 D) Cannot be determined

Question No. : 26

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

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

Question No. : 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) None of the statements B) Statement-1 only C) Both the statements D) Statement-2 only

Question No. : 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) Statement-2 only B) None of the statements C) Both the statements D) Statement-1 only

Question No. : 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) Both the statements B) Statement-2 only C) None of the statements D) Statement-1 only

DIRECTIONS for the question: Read the information given below and answer the question that follows.

Question No. : 30

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 × (2 × 5 × 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.

How many tokens did Qahira receive?

Question No. : 31

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

A) Rasheeda B) Pragnyaa C) Tantra D) Qahira

Question No. : 32

How many tokens did Chhaya award?

Question No. : 33

How many tokens did Smera receive?

Question No. : 34

Which of the following could be the amount of funding that Tantra received?

(a) Rs. 66,000 (b) Rs. 165,000

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

DIRECTIONS for the question: Read the information given below and answer the question that follows.

Question No. : 35

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:



- 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.
- 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.
- 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.
- 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.
- 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.

How many boys are there in the class?

Question No. : 36

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

- I. The number of boys who are interested in attending a 1-day event and are neither dancers nor singers.
 - II. The number of female dancers who are interested in attending a 1-day event.
- A) Neither I nor II B) Both I and II C) Only I D) Only II

Question No. : 37

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

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

Question No. : 38

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

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

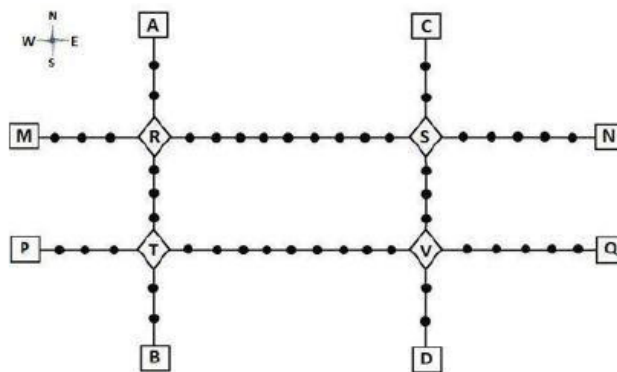
Question No. : 39

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

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

DIRECTIONS for the question: Read the information given below and answer the question that follows.

Question No. : 40



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.)

If Hari is ready to board a train at 8:05 am from station M, then when is the earliest that he can reach station N?

- A) 9:06 am B) 9:13 am C) 9:11 am D) 9:01 am

Question No. : 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) 11:28 am C) 11:22 am D) 11:07 am

Question No. : 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) 11:43 pm C) 11:49 am D) 11:35 pm

Question No. : 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)?

Question No. : 44

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

Section : Quantitative Ability

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 45

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

Question No. : 46

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

Question No. : 47

Alex invested his savings in two parts. The simple interest earned on the first part at 15% per annum for 4 years is the same as the simple interest earned on the second part at 12% per annum for 3 years. Then, the percentage of his savings invested in the first part is

- A) 62.5% B) 40% C) 60% D) 37.5%

Question No. : 48

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

Question No. : 49



In a class of 100 students, 73 like coffee, 80 like tea and 52 like lemonade. It may be possible that some students do not like any of these three drinks. Then the difference between the maximum and minimum possible number of students who like all the three drinks is

- A) 48 B) 52 C) 47 D) 53

Question No. : 50

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

Question No. : 51

Let a, b, c be non-zero real numbers such that $b^2 < 4ac$, and $f(x) = ax^2 + bx + c$. If the set S consists of all integers m such that $f(m) < 0$, then the set S must necessarily be

- A) the empty set B) either the empty set or the set of all integers C) the set of all integers
D) the set of all positive integers

Question No. : 52

Amal buys 110 kg of syrup and 120 kg of juice, syrup being 20% less costly than juice, per kg. He sells 10 kg of syrup at 10% profit and 20 kg of juice at 20% profit. Mixing the remaining juice and syrup, Amal sells the mixture at Rs. 308.32 per kg and makes an overall profit of 64%. Then, Amal's cost price for syrup, in rupees per kg, is

Question No. : 53

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

Question No. : 54

All the vertices of a rectangle lie on a circle of radius R . If the perimeter of the rectangle is P , then the area of the rectangle is

- A) $\frac{P^2}{2} - 2PR$ B) $\frac{P^2}{16} - R^2$ C) $\frac{P^2}{8} - 2R^2$ D) $\frac{P^2}{8} - \frac{R^2}{2}$

Question No. : 55

Let ABCD be a parallelogram such that the coordinates of its three vertices A, B, C are (1, 1), (3, 4) and (-2, 8), respectively. Then, the coordinates of the vertex D are

- A) (0, 11) B) (-3, 4) C) (4, 5) D) (-4, 5)

Question No. : 56

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

Question No. : 57

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

Question No. : 58

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) 7 C) 8 D) 4

Question No. : 59

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

Question No. : 60

Let $0 \leq a \leq x \leq 100$ and $f(x) = |x - a| + |x - 100| + |x - a - 50|$. Then the maximum value of $f(x)$ becomes 100 when a is equal to

A) 50 B) 25 C) 100 D) 0

Question No. : 61

The average of three integers is 13. When a natural number n is included, the average of these four integers remains an odd integer. The minimum possible value of n is

A) 3 B) 5 C) 4 D) 1

Question No. : 62

For any real number x , let $[x]$ be the largest integer less than or equal to x .

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

Question No. : 63

Ankita buys 4 kg cashews, 14 kg peanuts and 6 kg almonds when the cost of 7 kg cashews is the same as that of 30 kg peanuts or 9 kg almonds. She mixes all the three nuts and marks a price for the mixture in order to make a profit of Rs.1752. She sells 4 kg of the mixture at this marked price and the remaining at a 20% discount on the marked price, thus making a total profit of Rs. 744. Then the amount, in rupees, that she had spent in buying almonds is

A) 1176 B) 1680 C) 2520 D) 1440

Question No. : 64

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

Question No. : 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

Question No. : 66

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

A) 12 B) 10 C) 6 D) 15

**Directions of Test**

Test Name	Actual CAT 2022 Slot I	Total Questions	66	Total Time	120 Mins
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Section Name	No. of Questions	Time limit	Marks per Question	Negative Marking
Verbal Ability	24	0:40(h:m)	3	1/3
DI & Reasoning	20	0:40(h:m)	3	1/3
Quantitative Ability	22	0:40(h:m)	3	1/3

Section : Verbal Ability

QNo:- 1 ,Correct Answer:- A

Explanation:- The fourth paragraph is mainly talking about technology, law, and customs, and their similarities when these are regarded as institutions. Refer to lines: "As an environment, technologieshuman nature."

QNo:- 2 ,Correct Answer:- C

Explanation:- Although the passage states that technologies, like laws and customs, shape their inhabitants by 'privileging certain dimensions of their human nature', it does not state that technologies do so 'at a high cost to live nature'. Option 3 cannot be inferred.

QNo:- 3 ,Correct Answer:- A

Explanation:- The passage's main idea is that, as an environment, technology shapes its inhabitants. It is rephrased in Option 1.

We eliminate option 2 based on the passage's final line.

The fourth paragraph makes it apparent that laws and customs reflect certain dimensions of people's inherent nature. Option 4 is thus eliminated.

Option 3 is false since it says that nature "decides" the point at which society loses its capacity to control history. However, according to the 2nd line of the last para, "nature is what lies at the limit of history".

QNo:- 4 ,Correct Answer:- C

Explanation:- The second paragraph argues that "the same pattern prevails" wherever masses are organised, whether in Foucault's prisons or Habermas's public sphere. The trend being discussed here is that even as human rights issues gain in importance, the social order gradually becomes more authoritarian. Option 3, which contends that Habermas' public sphere and Foucault's prisons set the patterns for how crowds are organised, is false.

QNo:- 5 ,Correct Answer:- A

Explanation:- Refer to the last para, "Additionally the Stoic idea.....Islam..." Hence, option 1 is true. According to the 2nd para, the Epicureans believed in real relationships rather than unreal emotions. So, option 4 is incorrect.



Option 3 cannot be considered as true based on the passage. Option 1 is the exact opposite of what the passage says about Stoics.

QNo:- 6 ,Correct Answer:- B

Explanation:- Refer to para 1 of the passage. The only accurate inference that can be made from the example of Marcus Aurelius is that he was one of the leaders of the Roman army.

QNo:- 7 ,Correct Answer:- D

Explanation:- It is not implied by the given line that meditation allows "out-of-body" experiences. On the other hand, it claims that by distancing oneself from emotions, one can determine what is valuable and what is not. Option 3 can thus be implied.

The passage also states that one's next action in relation to emotion is called a "second movement." This implies option 2.

The quoted line also states that one can observe emotions without reacting to them by engaging in meditation and adopting the proper attitude. Thus, experiences can be received in a passive manner. This implies that option 1. So, only option 4 can't be implied from the quoted lines.

QNo:- 8 ,Correct Answer:- A

Explanation:- The question is tricky because it employs the use of a double-negative situation. Simplifying the question statement: A statement which, if false, contradicts the arguments of the passage is the one which, if true, supports the given arguments.

The passage's arguments are supported by Option 1. Refer to para 2, line 4. Hence, if option 1 were to be false, it would contradict the arguments in the passage.

QNo:- 9 ,Correct Answer:- A

Explanation:- According to the given line, the Undead are perceived as abnormal and given attributes that were unusual. The right answer is, therefore, Option 1.

QNo:- 10 ,Correct Answer:- B

Explanation:- The question is tricky. Let's rephrase it, "Except for one, all of the following statements, if true, do not agree with the passage."

Option 2, if true, is in accordance with the passage. In other words, if false, it is not in accordance with the passage. Refer to the line, "From the Middle Ages and into the Age of Enlightenment, theories of the Undead continued to grow and develop."

QNo:- 11 ,Correct Answer:- C

Explanation:- We can conclude from the quoted line that in the earliest years of mankind, there was a belief that eerie creatures existed, which were neither quite alive nor dead. Option 3 is the correct answer.

QNo:- 12 ,Correct Answer:- D



Explanation:- The passage is talking about the evolution of the stories of the Undead from ill-defined eerie creatures of Mankind's earliest years to more definitely shaped and even supernatural/magical creatures as mankind became more sophisticated.

Hence, the correct answer is option 4.

QNo:- 13 ,Correct Answer:- D

Explanation:- According to the passage, interventions were made in artworks that had been discovered in the West during the 17th century. Option 3 is therefore supported by the passage's reasoning. Option 4, though also about interventions in excavated artworks, implies that whether or not interventions were made was dependent on the Christian worldview of the artist. The passage does not mention this. So, option 4 does not follow from the given arguments. Based on the last paragraph, options 1 and 2 can be inferred.

QNo:- 14 ,Correct Answer:- D

Explanation:- An "unassailable original" means that the original is untouchable. Therefore, it is evident that the emphasis that the contemporary West places on an "unassailable original" deters them from making any interventions in ancient art. Additionally, since copies of paintings aren't thought to have any worth, it deters them from simultaneously displaying multiple copies. (refer to the 1st paragraph). It can also be deduced from the example of the cathedral of Freiburg Minster that the notion of an "unassailable original" gives those who repair the original, constant work. Options 1, 2, and 3 are therefore derived from the Western concept of an unassailable original. Whereas, option 4 does not follow from the concept.

QNo:- 15 ,Correct Answer:- C

Explanation:- According to the passage, Fuzhipin, or perfect replicas of the original, are just as valuable to the Chinese as the original. Only option 3 accurately replicates the original out of the available choices. An exact replica cannot be made from a photograph or miniature.

QNo:- 16 ,Correct Answer:- B

Explanation:- According to the passage, the Ise Shrine, unlike the Freiburg Minster, is not continually undergoing restoration, but is completely rebuilt from scratch every 20 years. Refer to the 2nd para.

QNo:- 17 ,Correct Answer:- D

Explanation:- The passage goes on to say why petitioning is an "expeditious" democratic tradition, noting that, unlike elections, which are episodic, petitions may guarantee that citizens' voices are heard and constantly incorporated into democratic government. The most complete of the provided summaries, Option 4, contains all the essential concepts.

QNo:- 18 ,Correct Answer:- 2431

Explanation:- The opening sentence will be 2, as it introduces the subject of the paragraph, i.e. "collagen". The next sentence will be 4, as this sentence uses the pronoun 'its', the antecedent of which can be linked to sentence 2, i.e. collagen. Also, 2 talks about the 'skin regeneration' property of collagen, which can be linked well to sentence 4, which mentions different types of animal collagen proteins. The following sentence will be 3, as 4-3 form the perfect cohesive pair, where 4 talks about problems faced in application of pig and cow collagen proteins, and 3 addresses the same problem with the use of fish collagen. The last sentence is 1, as there is further discussion on the properties of fish collagen, mentioned earlier in sentence 3.

Hence, the correct order will be: 2431



QNo:- 19 ,Correct Answer:- A

Explanation:- According to the given para, when we enter the world of quantum mechanics and discover that arbitrary distinctions between animate and inanimate simply cannot be created, we might grasp how limited our understanding of the universe is. All the major points are covered in Option 1.

QNo:- 20 ,Correct Answer:- 3214

Explanation:- The ideal opening statement is number 3, as it is a general rather than a specific sentence. 3-2 is a pair. According to sentences 3 and 2, the creative element is growing more quickly than the global economy. If the creative element of other sectors were also taken into account, the value of global industry would be larger still. Sentence 1 advances the notion from sentence 32 by describing how the creative element of product design may provide a competitive advantage. The paragraph is concluded in sentence 4, which explains why intellectual property is the main focus of today's trade issues.

Hence, the correct arrangement is 3214.

QNo:- 21 ,Correct Answer:- 2143

Explanation:- Sentences 1 and 2 have a clear connection because they both discuss the benefits of shorter commutes on employee performance. 4-3 is another example of a pair: sentence 4 states that some people believe that working commute-free is important for increasing productivity; sentence 3 explains why this isn't always the case. Another pair is clauses 1 and 4: 'Some' is used as the first pronoun in sentence 4. This obviously refers to some company leaders, who are the subject of sentence 1. Therefore, 4 comes just after 1. These connections show that the most logical order is 2143.

QNo:- 22 ,Correct Answer:- D

Explanation:- Finding the spot where the transition of ideas from one phrase to the next appears to be sudden is the ideal technique for inserting the missing sentence into the paragraph.

Given that the paragraph itself discusses how the Internet has proven to be both a blessing and a curse, the missing line would be the best fit as the paragraph's final sentence.

QNo:- 23 ,Correct Answer:- D

Explanation:- According to the passage provided, while historians have typically portrayed medieval Ethiopia as helpless and looking to Europe for protection, the "true story," which has been "buried in plain sight," is that the medieval world was richly connected, with the kings of Ethiopia sponsoring their own missions of diplomacy, faith, and commerce.

The best answer keeping the essence of the para in mind is option 4.

QNo:- 24 ,Correct Answer:- B

Explanation:- The missing line gives the reason for couples wanting to marry in secret. If you choose option 2, this sentence seamlessly ties into the thought in the preceding line and smoothly flows into the following one, adding another justification for secret marriages. Moreover, the 'anxiety' referred to here relates to couples 'feeling the pinch', mentioned in the previous sentence.



Section : DI & Reasoning

QNo:- 25 ,Correct Answer:- A

Explanation:-

Matches	1	2	3	4	5	6	7	8
Goals	4	1	1	1	2	1	1	1
Amla (A)-1/2	x			x		x	x	x
Bimla (B) -4	1	x	x	x	1	1	1	x
Harita (H) -5	3	x	x	1	x	x	x	1
Sarita (S)- 2/1	x			x			x	x

First, we have to figure out the highest number of goals scored by whom.

As we have to make total 12 goals.

Harita score minimum of total 5 goals as she scored more than Bimla.So, Bimla scores a total of 4 goals.

Therefore, Amla and Sarita scores either 1,2 or 2,1 goals.

Now, we have total 12 goals

We have two options for the same

3 1 2 1 1 1 2 1...(1st case)

Or

4 1 1 1 2 1 1 1...(2nd case)

Now, it is not possible that there are total 3 goals in the first match so 1st case is cancelled

In match 7 only 1 goal is scored :Option 1

QNo:- 26 ,Correct Answer:- D

Explanation:-

Matches	1	2	3	4	5	6	7	8
Goals	4	1	1	1	2	1	1	1
Amla (A)-1/2	x			x		x	x	x
Bimla (B) -4	1	x	x	x	1	1	1	x
Harita (H) -5	3	x	x	1	x	x	x	1
Sarita (S)- 2/1	x			x			x	x

First, we have to figure out the highest number of goals scored by whom.

As we have to make total 12 goals.

Harita score minimum of total 5 goals as she scored more than Bimla.So, Bimla scores a total of 4 goals.

Therefore, Amla and Sarita scores either 1,2 or 2,1 goals.

Now, we have total 12 goals

We have two options for the same

3 1 2 1 1 1 2 1...(1st case)

Or

4 1 1 1 2 1 1 1...(2nd case)

Correct sequence of goals is 4,1,2,1 : Option 4

QNo:- 27 ,Correct Answer:- C

Explanation:- Statement 1 : Total 3 vacant spaces are available where a total of 3 goals are to be scored.Now, the



combination of Amla and Sarita goals is 2 or 1. Therefore, if Amla scores a goal then Sarita cannot score a goal and if Sarita scores a goal then Amla cannot. So, this is true.

Statement 2 : Harita's goals have already been scored as she is the highest goal scorer and the places where Harita is not scoring goal are the places where Sarita would score the goal. Hence, this statement is also true.

Therefore both the statements are true : Option 3

QNo:- 28 ,Correct Answer:- B

Explanation:- Statement 1 : In first match, 4 goals are scored i.e 3 by Harita and 1 by Bimla. If Amla scores in 2nd match then Sarita scores in 3rd match. In the 4th match Harita is scoring the goal. In 5th, 6th & 7th match, Bimla scored a goal each. In 8th match Harita scores a goal. So, in every match atleast one player scored a goal.

Statement 2 : Amla scores either 1 or 2. Bimla scores 4. Harita scores 3. Sarita scores 2. Hence, no two players scored goals in the same number of matches.

Therefore, none of the statements is false.

QNo:- 29 ,Correct Answer:- C

Explanation:- Statement 1 : If Harita scored in 3 matches then Sarita scores 2. Therefore, Amla scores 1. Then Bimla scores in 4 matches. Now, Amla may or may not score good in consecutive matches.

Statement 2 : If Harita scored in 3 matches then Sarita scores 2. Therefore, Amla scores 1. Then Bimla scores in 4 matches. Now, Bimla may or may not score goals in consecutive matches.

Therefore, none of the statements is true.

QNo:- 30 ,Correct Answer:- 2

Explanation:- On the basis of the statements given following table can be made :

As it is given that from the face values funding is given which is a multiplying factor of 1000. So, we won't write 1000 with the values just to save the time.

		Bithi/Chhaya	Fathima	Bithi/Chhaya	Dhanavi	Esther	Adhara
Candidates	Funds	2	3	5	7	11	13
Pragnyaa	390	√	√	√	×	×	√
Rasheeda	210	√	√	√	√	×	×
Smera/Tantra	165	×	√	√	×	√	×
Qahira	77	×	×	×	√	√	×
Tantra/Smera	66	√	√	×	×	√	×

As observed Qahira receive 2 tokens

QNo:- 31 ,Correct Answer:- B

Explanation:- On the basis of the statements given following table can be made :

As it is given that from the face values funding is given which is a multiplying factor of 1000. So, we won't write 1000 with the values just to save the time.

		Bithi/Chhaya	Fathima	Bithi/Chhaya	Dhanavi	Esther	Adhara
Candidates	Funds	2	3	5	7	11	13
Pragnyaa	390	√	√	√	×	×	√
Rasheeda	210	√	√	√	√	×	×
Smera/Tantra	165	×	√	√	×	√	×



Qahira	77	x	x	x	√	√	x
Tantra/Smera	66	√	√	x	x	√	x

As observed above Pragnyaa received a token from Bithi but not from Dhanvi : Option 2

QNo:- 32 ,Correct Answer:- 3

Explanation:- On the basis of the statements given following table can be made :

As it is given that from the face values funding is given which is a multiplying factor of 1000. So, we won't write 1000 with the values just to save the time.

		Bithi/Chhaya	Fathima	Bithi/Chhaya	Dhanavi	Esther	Adhara
Candidates	Funds	2	3	5	7	11	13
Pragnyaa	390	√	√	√	x	x	√
Rasheeda	210	√	√	√	√	x	x
Smera/Tantra	165	x	√	√	x	√	x
Qahira	77	x	x	x	√	√	x
Tantra/Smera	66	√	√	x	x	√	x

From the table above we can say that Chhaya awarded 3 tokens with Bithi

QNo:- 33 ,Correct Answer:- 3

Explanation:- On the basis of the statements given following table can be made :

As it is given that from the face values funding is given which is a multiplying factor of 1000. So, we won't write 1000 with the values just to save the time.

		Bithi/Chhaya	Fathima	Bithi/Chhaya	Dhanavi	Esther	Adhara
Candidates	Funds	2	3	5	7	11	13
Pragnyaa	390	√	√	√	x	x	√
Rasheeda	210	√	√	√	√	x	x
Smera/Tantra	165	x	√	√	x	√	x
Qahira	77	x	x	x	√	√	x
Tantra/Smera	66	√	√	x	x	√	x

From the table above we can say that Smera has received 3 tokens

QNo:- 34 ,Correct Answer:- D

Explanation:- On the basis of the statements given following table can be made :

As it is given that from the face values funding is given which is a multiplying factor of 1000. So, we won't write 1000 with the values just to save the time.

		Bithi/Chhaya	Fathima	Bithi/Chhaya	Dhanavi	Esther	Adhara
Candidates	Funds	2	3	5	7	11	13
Pragnyaa	390	√	√	√	x	x	√
Rasheeda	210	√	√	√	√	x	x
Smera/Tantra	165	x	√	√	x	√	x
Qahira	77	x	x	x	√	√	x



Tantra/Smera	66	√	√	×	×	√	×
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From the table above we can say that Smera has received 3 tokens

QNo:- 35 ,Correct Answer:- 50

Explanation:- From the information available we can make the following table

	Boys (40)		Girls (15)	
	Singers	Dancers	Singers	Dancers
1				4
2	0			0
3	4	2	0	0

	Boys	Girls	Total
Singers	4	2	6
Dancers	6	4	10
Neither dancers nor singers	b	9	b + 9
	b + 10	15	b + 25

Using more information, we can have the following table :

	Boys (b = 40)	Girls
1	$0.8b + 8 = 40$	15
2	$0.6b + 6 = 30$	$10/5 < 15$
3	$4 + 2 = 6$	0

$0.7(0.6b + 6) = b - x$

$0.42b + 4.2 = b - x$

$0.58b = 4.2 + x$

b has to be a natural number if 4.2 is in the table of 48.

Multiplying it by 100

$58b = 420 + 100x$

For 'b' to be a natural number $x = 19, b = 40$

Which means $b = 40$

$0.6g = 9 - y$

Therefore g can be 10 or 5 and y can be 6 or 3

Now making the complete table again with this information

No of boys = $b + 10 = 40 + 10 = 50$

QNo:- 36 ,Correct Answer:- D

	Boys (40)		Girls (15)	
	Singers	Dancers	Singers	Dancers
1				4
2	0			0
3	4	2	0	0

Explanation:-

As observed from the table above we don't know what values can be given to 2-day event for boys dancers and 1-



day event for boys dancers what we only know is that the sum of the two is 4. Therefore statement I cannot be determined.

The number of female dancers who are interested in attending a 1-day event are 4 as no female dancer is interested for 3-day event and 60% of the girls i.e 9 who are interested in attending a 2-day event are neither singers nor dancers. As we know total girl dancers are 4 so they must attend 1-day event only. Therefore, Only II can be determined

QNo:- 37 ,Correct Answer:- A

Explanation:- From the information given above, we can make the following :

	Boys (b = 40)	Girls
1	$0.8b + 8 = 40$	15
2	$0.6b + 6 = 30$	10/5 < 15
3	$4 + 2 = 6$	0

If we take the girls for 2 day event be 10 then number of singers and dancers in the 2-day event will become more than the last statement. Therefore, the number of girls for 2 day event has to be taken as 5 and we already know the number of boys as 30

Therefore, the required fraction = $\frac{35}{65} = \frac{7}{13}$:Option 1

QNo:- 38 ,Correct Answer:- D

Explanation:- Using the table below, we have

	Boys (40)		Girls(50)	
	Singers	Dancers	Singers	Dancers
1	0	4-3		4
2	0	0-1		0
3	4	2	0	0

If we take 2nd option 4 or 6 then total dancers in boys = 2 + 0 + 4 = 6

2 + 1 + 3 = 6 but it is violating the condition 4 which says the number of singers attending a 2-day event is more than the number of dancers interested in attending a 2-day event. Hence 2nd option is false.

If we take 4th option then no of male dancers who are interested in attending a 1 –day event are 5 or 6 then we can have the table below

Event	Boys		Girls	
	Singers	Dancers	Singers	Dancers
1-day	0	5-6		2
2-day	0	0-1	1-2	0
3-day	4	0	0	2

This is not violating any of the conditions given above therefore answer is option 4

QNo:- 39 ,Correct Answer:- C

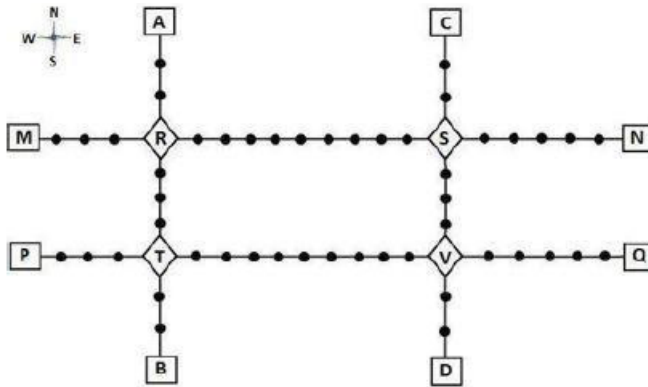


Explanation:-

Event	Boys		Girls	
	Singers	Dancers	Singers	Dancers
1-day	0	5-6		2
2-day	0	0-1	1-2	0
3-day	4	0	0	2

This we already know female dancers are interested in attending a 2-day event are 0 : Option 3

QNo:- 40 ,Correct Answer:- C



Explanation:-

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$8:05 + 66 \text{ min} = 9:11 \text{ am} : \text{Option 3}$

QNo:- 41 ,Correct Answer:- A

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

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

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

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



and board this train.

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

So, we will check the other option

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

If the train leaves from B at 10:15 then it will reach T at 10:26. It would leave at 10:28 from station T. So, Priya had waited for 3 minutes.

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

QNo:- 42 ,Correct Answer:- A

Explanation:- Haripriya has to reach station S late via station R if she must reach station B before 1 am

Using option 1 : 11:39

We have to find when the train would have left N. Suppose the train would have left around 11:20 then it would reach S at 11:37. It would leave station S at 11:39. So, she will board the train at 11:39 from S

$(S \rightarrow R) + 2 + (R \rightarrow T) + 2 + (T \rightarrow B) = 11:39 + 29 + 2 + 17 + 2 + 11 = 11:39 + 61 = 11:39 + 21 + 40 = 12:40 \text{ pm}$ which is the latest time by which she would reach station S

If we take option 4 i.e 11 : 35, then the train would have left N at 11:10 then it will take 17 min to reach S which is at 11:27 which will be left at 11:29. So, it is impossible for Haripriya to catch this train at 11:35.

Similarly if we taken option 2 i.e 11:43 then train would have left N at 11:30 minimum which will reach S at 11:47 so it is impossible for Haripriya to catch this train .Because if the train left N at 11:20 then it will reach 11:37 which will leave at 11:39 which is again impossible to catch again.

Therefore latest time to reach before 1 am is 12:41 am

QNo:- 43 ,Correct Answer:- 8

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

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

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

Total time for AB + BA = $56 + 56 = 112 \text{ min}$

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

Total number of trains = $\frac{112}{15} = 7.4$ approx, which implies there are more than 7 gaps, so 8 trains can be sent.

Therefore 8 trains is the answer

QNo:- 44 ,Correct Answer:- 48

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

For east-west root trains leave after every 10 minutes and rest of 15 minutes is also given after reaching the last terminal

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

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

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

Total time = $76 \times 2 = 152$

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

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

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

Number of trains = $\frac{112}{15} = 7.4$ approx implies more than 7 gaps are there so number of trains each side = 8

Total trains north-south direction = $8 + 8 = 16$

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

**Section : Quantitative Ability****QNo:- 45 ,Correct Answer:- 82****Explanation:-** Let $A = 3^k + 4^k + 5^k$ 3^k will always be odd as odd number to the power odd is always odd. 4^k will always be even as even number to the power even is always even 5^k will always be odd as odd number to the power odd is always odd

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

So, it will be always divisible by 2

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

So $A = 2$

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

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

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

If we put $k = 1$, then $B = 4 \times 20 = 80$ Then $A + B = 2 + 80 = 82$ **QNo:- 46 ,Correct Answer:- 34****Explanation:-** $xy + yz = 19$, $y(x + z) = 19$

Now, we have two cases

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

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

$$yz + xz = 51$$

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

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

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

Combining (1) and (2) together

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

Combining (1) and (3) together

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

The minimum value of $xyz = 34$ **QNo:- 47 ,Correct Answer:- D****Explanation:-** Let the first part be x and second part be y

According to question

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

$$\Rightarrow 60x = 36y$$

$$\Rightarrow 5x = 3y$$

$$\Rightarrow \frac{x}{y} = \frac{3}{5}$$

$$\Rightarrow \text{total saving} = 8$$

$$\% \text{ saving in first part} = \frac{3}{8} \times 100 = 37.5\% : \text{Option 4}$$

QNo:- 48 ,Correct Answer:- 3**Explanation:-** $a^2 + ab + a = 14$ and $b^2 + ab + b = 28$

$$a(a+b+1) = 14 \dots (1) \text{ and } b(b+a+1) = 28 \dots (2)$$

divide (1) by (2)



$$\frac{a(a+b+1)}{b(a+b+1)} = \frac{14}{28} = \frac{1}{2}$$

$$a = 1, b = 2 \Rightarrow 2a + b = 2(1) + 2 = 4$$

$$a = 2, b = 4 \Rightarrow 2a + b = 2(2) + 4 = 8 : \text{Option 3}$$

QNo:- 49 ,Correct Answer:- C

Explanation:- Maximum number of students who like all the drinks = minimum value of all = 52

Minimum number of students who like all the drinks

Total number of students = 73 + 80 + 52 = 205

Giving 1 to each of the students twice = $100 \times 2 = 200$

Minimum number of students who like all the drinks = $205 - 200 = 5$

Difference between maximum and minimum value = $52 - 5 = 47$: Option 3

QNo:- 50 ,Correct Answer:- D

Explanation:- Let the lemon juice be 10 litre

Let the sugar juice be 10 litre

Total mixture = 20 liter

New mixture sugar added be in the ratio 1:3

20 liter mixture and 60 liter sugar syrup

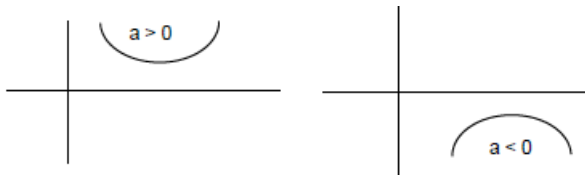
New lemon juice = 10 liter

New sugar syrup = $10 + 60 = 70$

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

QNo:- 51 ,Correct Answer:- B

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



Hence either $f(m) < 0$

Or $f(m) > 0$

So, all set of integers or empty set : Option 2

QNo:- 52 ,Correct Answer:- 160

Explanation:- Let cost price of syrup = Rs 80 x/kg

Cost price of juice = Rs 100x/ kg

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

Selling price = $80x \times 1.1 \times 10 \text{ kg} + 100x \times 1.2 \times 20 \text{ kg} + 308.32 \times 200 \text{ kg}$
 $= 880x + 2400x + 61664 = 3280x + 61664$

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

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

$30832x = 61664$

$x = 2$

cost price of syrup = $80x = 160$

QNo:- 53 ,Correct Answer:- 43200



Explanation:- Let the number of males be $5k$

Let the number of females be $4k$

Let the number of literate males = $2x$

Let the number of literate females = $3x$

Let the number of illiterate males = $4y$

Let the number of illiterate females = $3y$

According to question

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

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

Now, total ratio of males and females

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

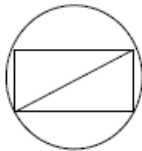
$$\Rightarrow 8x+16y = 15x+15y$$

$$\Rightarrow 7x = y$$

$$\Rightarrow \frac{x}{y} = \frac{1}{7}$$

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

QNo:- 54 ,Correct Answer:- C



Explanation:-

Let the radius of the circle be R

Diameter of the circle = $2R$

Let the length of rectangle be ' l '

Let the breadth of rectangle be ' b '

Diagonal of the rectangle = diameter of the circle = $(2R)^2$

$$= (\sqrt{l^2 + b^2})^2$$

$$= l^2 + b^2$$

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

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

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

squaring both sides

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

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

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

$$\Rightarrow A = \frac{P^2}{8} - 2R^2: \text{Option 3}$$

QNo:- 55 ,Correct Answer:- D

Explanation:- As we know diagonals of a rectangle bisect each other.

Let the diagonals be AC and BD

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

Using mid-point formula



$$AC = BD$$

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

$$\frac{1+8}{2} = \frac{4+y}{2} \Rightarrow 9 = 4+y \Rightarrow y = 5$$

$C(-4,5)$: Option 4

QNo:- 56 ,Correct Answer:- C

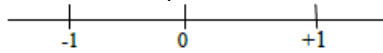
Explanation:- $|x + a| + |x - 1| = 2$

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

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

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

For the critical points -1 and 1 whose sum $= 1 - (-1) = 2 = RHS$



Therefore, we will get infinite number of solutions putting $a = -1$

QNo:- 57 ,Correct Answer:- 84

Explanation:- Let the four children be a, b, c and d

As per the condition

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

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

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

$$x + y + z + p = 10$$

as each child must get 1 balloon, so giving 1 balloon to each child

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

Now finding total number of non negative integral solutions, we get

$$6 + 3C_3 = 9C_3 = \frac{9 \times 8 \times 7}{3 \times 2 \times 1} = 3 \times 4 \times 7 = 84$$

QNo:- 58 ,Correct Answer:- B

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

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

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

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

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

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

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

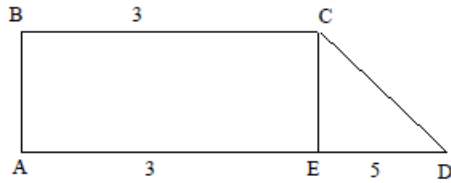
$$\text{Putting } n = 7, S_7 = 7 + 2(7)^2 = 7 + 2 \times 49 = 7 + 98 = 105, a_7 = 105 - 78 = 27$$

Now as we have got the Arithmetic series as

3, 7, 11, 15, 19, 23, 27

We can see the smallest multiple of 9 is 27 which is a_7 so the value of $n = 7$: Option 2

QNo:- 59 ,Correct Answer:- 66

**Explanation:-**

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

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

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

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

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

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

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

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

so $x = 12$ and $y = 13$ as $5, 12, 13$ make a pythagoras triplet

$$x + y = 25$$

Area of a trapezium = $\frac{1}{2}(\text{sum of parallel sides}) \times \text{distance between them}$

$$= \frac{1}{2}(3+8) \times 12 = 66 \text{ cm}^2$$

QNo:- 60 ,Correct Answer:- A

Explanation:- Using option 2, $a = 25$

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

Critical points are $25, 75, 100$

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

$$A = 50$$

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

put $x = 50$

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

QNo:- 61 ,Correct Answer:- B

Explanation:- Sum of 3 integers = $13 \cdot 3 = 39$

When a natural number n is included

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

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

So, answer is option 2

QNo:- 62 ,Correct Answer:- 44

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

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

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

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

Explanation:-



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

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

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

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

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

Sum of terms from n = 20 to 44 we get the sum as 1 + 1 + 1 = 25

For n = 20,21,22,23.....44

Therefore, N = 44

QNo:- 63 ,Correct Answer:- B

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

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

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

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

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

Total cost price = $360x + 294x + 420x = 1074x$

Let the selling price be y Rs/ kg

$4y + 20y = 1752.....(1)$

$4y + 16y = 744.....(2)$

Subtract (2) – (1)

$4y = 1008$

$24y = 6048$

Total cost = $6048 - 1752 = 1074x$

$1074x = 4296$

$x = 4$

Price of almonds = $420x = 420(4) = 1680$: Option 2

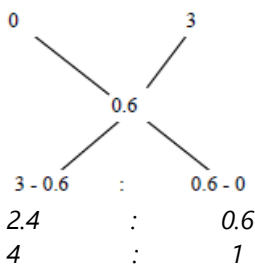
QNo:- 64 ,Correct Answer:- C

Explanation:- Let the original average be 0

The new average = $0 + 3 = 3$

Overall change in average = 0.6

Using alligation method



QNo:- 65 ,Correct Answer:- 111

Explanation:- Let the total number of persons ahead = 3x

Let the total number of persons behind = 5x

Total number of persons = $3x + 5x + 1 < 300$

$8x < 300 - 1 < 299$



$$x < 37.3$$

so $x = 37$ (integral value = 37)

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

QNo:- 66 ,Correct Answer:- D

Explanation:- Let suppose train B take 't' time to reach at the meeting point

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

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

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

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

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

putting $t = 6$ we get LHS = RHS = 6

therefore the total time taken by train B to reach station X is $9 + 6 = 15$ minutes

: Option 4

**Directions of Test**

Test Name	Actual CAT 2022 Slot II	Total Questions	66	Total Time	120 Mins
Section Name	No. of Questions	Time limit	Marks per Question	Negative Marking	
Verbal Ability	24	0:40(h:m)	3	1/3	
DI & Reasoning	20	0:40(h:m)	3	1/3	
Quantitative Ability	22	0:40(h:m)	3	1/3	

Section : Verbal Ability

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

Question No. : 1

[Octopuses are] misfits in their own extended families They belong to the Mollusca class Cephalopoda. But they don't look like their cousins at all. Other molluscs include sea snails, sea slugs, bivalves – most are shelled invertebrates with a dorsal foot. Cephalopods are all arms, and can be as tiny as 1 centimetre and as large as 30 feet. Some of them have brains the size of a walnut, which is large for an invertebrate.....

It makes sense for these molluscs to have added protection in the form of a higher cognition; they don't have a shell covering them, and pretty much everything feeds on cephalopods, including humans. But how did cephalopods manage to secure their own invisibility cloak? Cephalopods fire from multiple cylinders to achieve this in varying degrees from species to species. There are four main catalysts – chromatophores, iridophores, papillae and leucophores.....

[Chromatophores] are organs on their bodies that contain pigment sacs, which have red, yellow and brown pigment granules. These sacs have a network of radial muscles, meaning muscles arranged in a circle radiating outwards. These are connected to the brain by a nerve. When the cephalopod wants to change colour, the brain carries an electrical impulse through the nerve to the muscles that expand outwards, pulling open the sacs to display the colours on the skin. Why these three colours? Because these are the colours the light reflects at the depths they live in (the rest is absorbed before it reaches those depths)

Well, what about other colours? Cue the iridophores. Think of a second level of skin that has thin stacks of cells. These can reflect light back at different wavelengths..... It's using the same properties that we've seen in hologram stickers, or rainbows on puddles of oil. You move your head and you see a different colour. The sticker isn't doing anything but reflecting light – it's your movement that's changing the appearance of the colour. This property of holograms, oil and other such surfaces is called "iridescence"

Papillae are sections of the skin that can be deformed to make a texture bumpy. Even humans possess them (goosebumps) but cannot use them in the manner that cephalopods can. For instance, the use of these cells is how an octopus can wrap itself over a rock and appear jagged or how a squid or cuttlefish can imitate the look of a coral reef by growing miniature towers on its skin. It actually matches the texture of the substrate it chooses.

Finally, the leucophores: According to a paper, published in Nature, cuttlefish and octopuses possess an additional type of reflector cell called a leucophore. They are cells that scatter full spectrum light so that they appear white in a similar way that a polar bear's fur appears white. Leucophores will also reflect any filtered light shown on them..... If the water appears blue at a certain depth, the octopuses and cuttlefish can appear blue; if the water appears green, they appear green, and so on and so forth.

All of the following are reasons for octopuses being "misfits" EXCEPT that they:

- A) exhibit higher intelligence than other molluscs. B) have several arms. C) are consumed by humans and other animals.
D) do not possess an outer protective shell.

Question No. : 2

Which one of the following statements is not true about the camouflaging ability of Cephalopods?



- A) Cephalopods can change their colour. B) Cephalopods can take on the colour of their predator.
C) Cephalopods can change their texture. D) Cephalopods can blend into the colour of their surroundings.

Question No. : 3

Based on the passage, it can be inferred that camouflaging techniques in an octopus are most dissimilar to those in:

- A) sea snails B) cuttlefish C) polar bears D) squids

Question No. : 4

Based on the passage, we can infer that all of the following statements, if true, would weaken the camouflaging adeptness of Cephalopods EXCEPT

- A) the hydrostatic pressure at the depths at which Cephalopods reside renders radial muscle movements difficult.
B) the temperature of water at the depths at which Cephalopods reside renders the transmission of neural signals difficult.
C) light reflects the colours red, green, and yellow at the depths at which Cephalopods reside.
D) the number of chromatophores in Cephalopods is half the number of iridophores and leucophores.

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

Question No. : 5

When we teach engineering problems now, we ask students to come to a single “best” solution defined by technical ideals like low cost, speed to build, and ability to scale. This way of teaching primes students to believe that their decision-making is purely objective, as it is grounded in math and science. This is known as technical-social dualism, the idea that the technical and social dimensions of engineering problems are readily separable and remain distinct throughout the problem-definition and solution process.

Nontechnical parameters such as access to a technology, cultural relevancy or potential harms are deemed political and invalid in this way of learning. But those technical ideals are at their core social and political choices determined by a dominant culture focused on economic growth for the most privileged segments of society. By choosing to downplay public welfare as a critical parameter for engineering design, we risk creating a culture of disengagement from societal concerns amongst engineers that is antithetical to the ethical code of engineering.

In my field of medical devices, ignoring social dimensions has real consequences. ... Most FDA-approved drugs are incorrectly dosed for people assigned female at birth, leading to unexpected adverse reactions. This is because they have been inadequately represented in clinical trials.

Beyond physical failings, subjective beliefs treated as facts by those in decision-making roles can encode social inequities. For example, spirometers, routinely used devices that measure lung capacity, still have correction factors that automatically assume smaller lung capacity in Black and Asian individuals. These racially based adjustments are derived from research done by eugenicists who thought these racial differences were biologically determined and who considered nonwhite people as inferior. These machines ignore the influence of social and environmental factors on lung capacity.

Many technologies for systemically marginalized people have not been built because they were not deemed important such as better early diagnostics and treatment for diseases like endometriosis, a disease that afflicts 10 percent of people with uteruses. And we hardly question whether devices are built sustainably, which has led to a crisis of medical waste and health care accounting for 10 percent of U.S. greenhouse gas emissions.

Social justice must be made core to the way engineers are trained. Some universities are working on this Engineers taught this way will be prepared to think critically about what problems we choose to solve, how we do so responsibly and how we build teams that challenge our ways of thinking.

Individual engineering professors are also working to embed societal needs in their pedagogy. Darshan Karwat at the University of Arizona developed activist engineering to challenge engineers to acknowledge their full moral and social responsibility through practical self- reflection. Khalid Kadir at the University of California, Berkeley, created the popular course Engineering, Environment, and Society that teaches engineers how to engage in place-based knowledge, an understanding of the people, context and history, to design better technical approaches in collaboration with communities. When we design and build with equity and justice in mind, we craft better solutions that respond to the complexities of entrenched systemic problems.

In this passage, the author is making the claim that:



- A) the objective of best solutions in engineering has shifted the focus of pedagogy from humanism and social obligations to technological perfection.
- B) engineering students today are trained to be non-subjective in their reasoning as this best enables them to develop much-needed universal solutions.
- C) technical-social dualism has emerged as a technique for engineering students to incorporate social considerations into their technical problem-solving processes.
- D) engineering students today are taught to focus on objective technical outcomes, independent of the social dimensions of their work.

Question No. : 6

The author gives all of the following reasons for why marginalised people are systematically discriminated against in technology-related interventions EXCEPT

- A) "But those technical ideals are at their core social and political choices determined by a dominant culture focused on economic growth for the most privileged segments of society."
- B) "Beyond physical failings, subjective beliefs treated as facts by those in decision-making roles can encode social inequities."
- C) "And we hardly question whether devices are built sustainably, which has led to a crisis of medical waste and health care accounting for 10 percent of U.S. greenhouse gas emissions."
- D) "These racially based adjustments are derived from research done by eugenicists who thought these racial differences were biologically determined and who considered nonwhite people as inferior."

Question No. : 7

All of the following are examples of the negative outcomes of focusing on technical ideals in the medical sphere EXCEPT the:

- A) neglect of research and development of medical technologies for the diagnosis and treatment of diseases that typically afflict marginalised communities.
- B) exclusion of non-privileged groups in clinical trials which leads to incorrect drug dosages.
- C) incorrect assignment of people as female at birth which has resulted in faulty drug interventions.
- D) continuing calibration of medical devices based on past racial biases that have remained unadjusted for changes.

Question No. : 8

We can infer that the author would approve of a more evolved engineering pedagogy that includes all of the following EXCEPT:

- A) making considerations of environmental sustainability intrinsic to the development of technological solutions.
- B) moving towards technical-social dualism where social community needs are incorporated in problem-definition and solutions.
- C) design that is based on the needs of communities using local knowledge and responding to local priorities.
- D) a more responsible approach to technical design and problem-solving than a focus on speed in developing and bringing to scale.

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

Question No. : 9

Humans today make music. Think beyond all the qualifications that might trail after this bald statement: that only certain humans make music, that extensive training is involved, that many societies distinguish musical specialists from nonmusicians, that in today's societies most listen to music rather than making it, and so forth. These qualifications, whatever their local merit, are moot in the face of the overarching truth that making music, considered from a cognitive and psychological vantage, is the province of all those who perceive and experience what is made. We are, almost all of us, musicians — everyone who can entrain (not necessarily dance) to a beat, who can recognize a repeated tune (not necessarily sing it), who can distinguish one instrument or one singing voice from another. I will often use an antique word, recently revived, to name this broader musical experience. Humans are musicking creatures.....

The set of capacities that enables musicking is a principal marker of modern humanity. There is nothing polemical in this assertion except a certain insistence, which will figure often in what follows, that musicking be included in our thinking about fundamental human commonalities. Capacities involved in musicking are many and take shape in complicated ways, arising from innate dispositions Most of these capacities overlap with nonmusical ones, though a few may be distinct and dedicated to musical perception and production. In the area of overlap, linguistic capacities seem to be particularly important, and humans are (in principle) language-makers in addition to music-makers — speaking creatures as well as musicking ones.



Humans are symbol-makers too, a feature tightly bound up with language, not so tightly with music. The species *Cassirer* dubbed *Homo symbolicus* cannot help but tangle musicking in webs of symbolic thought and expression, habitually making it a component of behavioral complexes that form such expression. But in fundamental features musicking is neither language-like nor symbol-like, and from these differences come many clues to its ancient emergence.

If musicking is a primary, shared trait of modern humans, then to describe its emergence must be to detail the coalescing of that modernity. This took place, archaeologists are clear, over a very long *durée*: at least 50,000 years or so, more likely something closer to 200,000, depending in part on what that coalescence is taken to comprise. If we look back 20,000 years, a small portion of this long period, we reach the lives of humans whose musical capacities were probably little different from our own. As we look farther back we reach horizons where this similarity can no longer hold — perhaps 40,000 years ago, perhaps 70,000, perhaps 100,000. But we never cross a line before which all the cognitive capacities recruited in modern musicking abruptly disappear. Unless we embrace the incredible notion that music sprang forth in full-blown glory, its emergence will have to be tracked in gradualist terms across a long period.

This is one general feature of a history of music's emergence..... The history was at once sociocultural and biological..... The capacities recruited in musicking are many, so describing its emergence involves following several or many separate strands.

Which one of the following sets of terms best serves as keywords to the passage?

- A) Humans; Musicking; Linguistic capacities; Symbol-making; Modern humanity.
- B) Musicking; Cognitive psychology; Antique; Symbol-makers; Modernity.
- C) Humans; Psychological vantage; Musicking; *Cassirer*; Emergence of music.
- D) Humans; Capacities; Language; Symbols; Modernity

Question No. : 10

Based on the passage, which one of the following statements is a valid argument about the emergence of music/musicking?

- A) 20,000 years ago, human musical capacities were not very different from what they are today.
- B) Anyone who can perceive and experience music must be considered capable of musicking.
- C) All musical work is located in the overlap between linguistic capacity and music production.
- D) Although musicking is not language-like, it shares the quality of being a form of expression.

Question No. : 11

Which one of the following statements, if true, would weaken the author's claim that humans are musicking creatures?

- A) Musical capacities are primarily socio-cultural, which explains the wide diversity of musical forms.
- B) As musicking is neither language-like nor symbol-like, it is a much older form of expression.
- C) Nonmusical capacities are of far greater consequence to human survival than the capacity for music.
- D) From a cognitive and psychological vantage, musicking arises from unconscious dispositions, not conscious ones.

Question No. : 12

"Think beyond all the qualifications that might trail after this bald statement " In the context of the passage, what is the author trying to communicate in this quoted extract?

- A) A bald statement is one that is trailed by a series of qualifying clarifications and caveats.
- B) Although there may be many caveats and other considerations, the statement is essentially true.
- C) Thinking beyond qualifications allows us to give free reign to musical expressions.
- D) A bald statement is one that requires no qualifications to infer its meaning.

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

Question No. : 13

We begin with the emergence of the philosophy of the social sciences as an arena of thought and as a set of social institutions. The two characterisations overlap but are not congruent. Academic disciplines are social institutions..... My view is that institutions are all those social entities that organise action: they link acting individuals into social structures. There are various kinds of institutions. Hegelians and Marxists emphasise universal institutions such as the family, rituals, governance, economy and the military. These are mostly institutions that just grew. Perhaps in some imaginary beginning of time they spontaneously appeared. In their present incarnations, however, they are very much the product of conscious attempts to mould and plan them. We have family law, established and disestablished churches, constitutions and laws, including those governing the



economy and the military. Institutions deriving from statute, like joint-stock companies are formal by contrast with informal ones such as friendships. There are some institutions that come in both informal and formal variants, as well as in mixed ones. Consider the fact that the stock exchange and the black market are both market institutions, one formal one not. Consider further that there are many features of the work of the stock exchange that rely on informal, noncodifiable agreements, not least the language used for communication. To be precise, mixtures are the norm..... From constitutions at the top to by-laws near the bottom we are always adding to, or tinkering with, earlier institutions, the grown and the designed are intertwined.

It is usual in social thought to treat culture and tradition as different from, although alongside, institutions. The view taken here is different. Culture and tradition are sub-sets of institutions analytically isolated for explanatory or expository purposes. Some social scientists have taken all institutions, even purely local ones, to be entities that satisfy basic human needs – under local conditions.....Others differed and declared any structure of reciprocal roles and norms an institution. Most of these differences are differences of emphasis rather than disagreements. Let us straddle all these versions and present institutions very generally.....as structures that serve to coordinate the actions of individuals.....Institutions themselves then have no aims or purpose other than those given to them by actors or used by actors to explain them.....

Language is the formative institution for social life and for science..... Both formal and informal language is involved, naturally grown or designed. (Language is all of these to varying degrees.) Languages are paradigms of institutions or, from another perspective, nested sets of institutions. Syntax, semantics, lexicon and alphabet/character-set are all institutions within the larger institutional framework of a written language. Natural languages are typical examples of what Ferguson called 'the result of human action, but not the execution of any human design'[:] reformed natural languages and artificial languages introduce design into their modifications or refinements of natural language. Above all, languages are paradigms of institutional tools that function to coordinate.

In the first paragraph of the passage, what are the two "characterisations" that are seen as overlapping but not congruent?

- A) "individuals" and "social structures".
- B) "academic disciplines" and "institutions".
- C) "an arena of thought" and "academic disciplines".
- D) "the philosophy of the social sciences" and "a set of social institutions".

Question No. : 14

All of the following inferences from the passage are false, EXCEPT:

- A) the institution of friendship cannot be found in the institution of joint-stock companies because the first is an informal institution, while the second is a formal one.
- B) "natural language" refers to that stage of language development where no conscious human intent is evident in the formation of language.
- C) institutions like the family, rituals, governance, economy, and the military are natural and cannot be consciously modified.
- D) as concepts, "culture" and "tradition" have no analytical, explanatory or expository power, especially when they are treated in isolation.

Question No. : 15

"Consider the fact that the stock exchange and the black market are both market institutions, one formal one not." Which one of the following statements best explains this quote, in the context of the passage?

- A) The stock exchange and the black market are examples of how, even within the same domain, different kinds of institutions can co-exist.
- B) The stock exchange and the black market are both dependent on the market to survive.
- C) The stock exchange and the black market are both organised to function by rules.
- D) Market instruments can be formally traded in the stock exchange and informally traded in the black market.

Question No. : 16

Which of the following statements best represents the essence of the passage?

- A) Language is the fundamental formal institution for social life and for science.
- B) It is usual in social thought to treat culture and tradition as different from institutions.
- C) The stock exchange and the black market are both market institutions.
- D) Institutions are structures that serve to coordinate the actions of individuals.

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

**Question No. : 17**

1. From chemical pollutants in the environment to the damming of rivers to invasive species transported through global trade and travel, every environmental issue is different and there is no single tech solution that can solve this crisis.
2. Discourse on the threat of environmental collapse revolves around cutting down emissions, but biodiversity loss and ecosystem collapse are caused by myriad and diverse reasons.
3. This would require legislation that recognises the rights of future generations and other species that allows the judiciary to uphold a much higher standard of environmental protection than currently possible.
4. Clearly, our environmental crisis requires large political solutions, not minor technological ones, so, instead of focusing on infinite growth, we could consider a path of stable-state economies, while preserving markets and healthy competition.

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

Question No. : 18

1. The trajectory of cheerfulness through the self is linked to the history of the word 'cheer' which comes from an Old French meaning 'face'.
2. Translations of the Bible into vernacular languages, expanded the noun 'cheer' into the more abstract 'cheerful-ness', something that circulates as an emotional and social quality defining the self and a moral community.
3. When you take on a cheerful expression, no matter what the state of your soul, your cheerfulness moves into the self: the interior of the self is changed by the power of cheer.
4. People in the medieval 'Canterbury Tales' have a 'piteous' or a 'sober' cheer; 'cheer' is an expression and a body part, lying at the intersection of emotions and physiognomy.

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

Question No. : 19

1. Women may prioritize cooking because they feel they alone are responsible for mediating a toxic and unhealthy food system.
2. Food is commonly framed through the lens of individual choice: you can choose to eat healthily.
3. This is particularly so in a neoliberal context where the state has transferred the responsibility for food onto individual consumers.
4. The individualized framing of choice appeals to a popular desire to experience agency, but draws away from the structural obstacles that stratify individual food choices.

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

Question No. : 20

Sentence: Most were first-time users of a tablet and a digital app.

Paragraph: Aage Badhein's USP lies in the ethnographic research that constituted the foundation of its development process. Customizations based on learning directly from potential users were critical to making this self-paced app suitable for both a literate and non-literate audience. ___(1)___The user interface caters to a Hindi-speaking audience who have minimal to no experience with digital services and devices. ___(2)___The content and functionality of the app are suitable for a wide audience. This includes youth preparing for an independent role in life or a student ready to create a strong foundation of financial management early in her life. ___(3)___Household members desirous of improving their family's financial strength to reach their aspirations can also benefit. We piloted Aage Badhein in early 2021 with over 400 women from rural areas. ___(4)___The digital solution generated a large amount of interest in the communities.

- A) Option 1 B) Option 2 C) Option 3 D) Option 4

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

**Question No. : 21**

Sentence: This was years in the making but fast-tracked during the pandemic, when "people started being more mindful about their food", he explained.

Paragraph: For millennia, ghee has been a venerated staple of the subcontinental diet, but it fell out of favour a few decades ago when saturated fats were largely considered to be unhealthy. ___(1)___ But more recently, as the thinking around saturated fats is shifting globally, Indians are finding their own way back to this ingredient that is so integral to their cuisine. ___(2)___ For Karmakar, a renewed interest in ghee is emblematic of a return-to-basics movement in India. ___(3)___ This movement is also part of an overall trend towards "slow food". In keeping with the movement's philosophy, ghee can be produced locally (even at home) and has inextricable cultural ties. ___(4)___ At a basic level, ghee is a type of clarified butter believed to have originated in India as a way to preserve butter from going rancid in the hot climate.

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

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

Question No. : 22

Several of the world's earliest cities were organised along egalitarian lines. In some regions, urban populations governed themselves for centuries without any indication of the temples and palaces that would later emerge; in others, temples and palaces never emerged at all, and there is simply no evidence of a class of administrators or any other sort of ruling stratum. It would seem that the mere fact of urban life does not, necessarily, imply any particular form of political organization, and never did. Far from resigning us to inequality, the picture that is now emerging of humanity's past may open our eyes to egalitarian possibilities we otherwise would have never considered.

- A) Contrary to our assumption that urban settlements have always involved hierarchical political and administrative structures, ancient cities were not organised in this way.
- B) The lack of hierarchical administration in ancient cities can be deduced by the absence of religious and regal structures such as temples and palaces.
- C) The emergence of a class of administrators and ruling stratum transformed the egalitarian urban life of ancient cities to the hierarchical civic organisations of today.
- D) We now have the evidence in support of the existence of an egalitarian urban life in some ancient cities, where political and civic organisation was far less hierarchical.

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

Question No. : 23

Today, many of the debates about behavioural control in the age of big data echo Cold War-era anxieties about brainwashing, insidious manipulation and repression in the 'technological society'. In his book Psychopolitics, Han warns of the sophisticated use of targeted online content, enabling 'influence to take place on a pre-reflexive level'. On our current trajectory, "freedom will prove to have been merely an interlude." The fear is that the digital age has not liberated us but exposed us, by offering up our private lives to machine-learning algorithms that can process masses of personal and behavioural data. In a world of influencers and digital entrepreneurs, it's not easy to imagine the resurgence of a culture engendered through disconnect and disaffiliation, but concerns over the threat of online targeting, polarisation and big data have inspired recent polemics about the need to rediscover solitude and disconnect.

- A) The role of technology in influencing public behaviour is reminiscent of the manner in which behaviour was manipulated during the Cold War.
- B) With big data making personal information freely available, the debate on the nature of freedom and the need for privacy has resurfaced.
- C) The notion of freedom and privacy is at stake in a world where artificial intelligence is capable of influencing behaviour through data gathered online.
- D) Rather than freeing us, digital technology is enslaving us by collecting personal information and influencing our online behaviour.

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

**Question No. : 24**

There's a common idea that museum artworks are somehow timeless objects available to admire for generations to come. But many are objects of decay. Even the most venerable Old Master paintings don't escape: pigments discolour, varnishes crack, canvases warp. This challenging fact of art-world life is down to something that sounds more like a thread from a morality tale: inherent vice. Damien Hirst's iconic shark floating in a tank – entitled *The Physical Impossibility of Death in the Mind of Someone Living* – is a work that put a spotlight on inherent vice. When he made it in 1991, Hirst got himself in a pickle by not using the right kind of pickle to preserve the giant fish. The result was that the shark began to decompose quite quickly – its preserving liquid clouding, the skin wrinkling, and an unpleasant smell wafting from the tank.

- A) Artworks may not last forever; they may deteriorate with time, and the challenge is to slow down their degeneration.
- B) Museums have to guard timeless art treasures from intrinsic defects such as the deterioration of paint, polish and canvas.
- C) Museums are left with the moral responsibility of restoring and preserving the artworks since artists cannot preserve their works beyond their life.
- D) The role of museums has evolved to ensure that the artworks are preserved forever in addition to guarding and displaying them.

Section : DI & Reasoning

DIRECTIONS for the question: Go through the graph and the information given below and answer the question that follows.

Question No. : 25

A speciality supermarket sells 320 products. Each of these products was either a cosmetic product or a nutrition product. Each of these products was also either a foreign product or a domestic product. Each of these products had at least one of the two approvals – FDA or EU.

The following facts are also known:

1. There were equal numbers of domestic and foreign products.
2. Half of the domestic products were FDA approved cosmetic products.
3. None of the foreign products had both the approvals, while 60 domestic products had both the approvals.
4. There were 140 nutrition products, half of them were foreign products.
5. There were 200 FDA approved products. 70 of them were foreign products and 120 of them were cosmetic products

How many foreign products were FDA approved cosmetic products? (in numerical value only)

Question No. : 26

How many cosmetic products did not have FDA approval?

- A) Cannot be determined B) 10 C) 60 D) 50

Question No. : 27

Which among the following options best represents the number of domestic cosmetic products that had both the approvals?

- A) At least 10 and at most 60 B) At least 10 and at most 80 C) At least 20 and at most 50 D) At least 20 and at most 70

Question No. : 28

If 70 cosmetic products did not have EU approval, then how many nutrition products had both the approvals?

- A) 10 B) 50 C) 20 D) 30

Question No. : 29

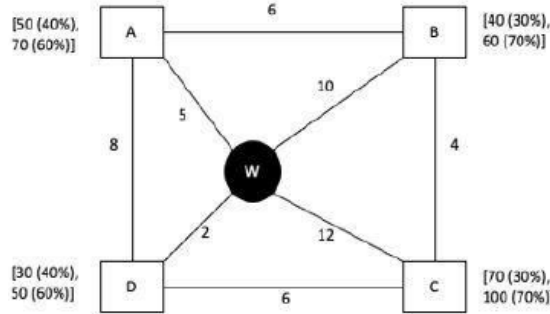
If 50 nutrition products did not have EU approval, then how many domestic cosmetic products did not have EU approval? (in numerical value only)

DIRECTIONS for the question: Study the following information carefully and answer the given question.



Question No. : 30

Every day a widget supplier supplies widgets from the warehouse (W) to four locations – Ahmednagar (A), Bikrampore (B), Chitrachak (C), and Deccan Park (D). The daily demand for widgets in each location is uncertain and independent of each other. Demands and corresponding probability values (in parenthesis) are given against each location (A, B, C, and D) in the figure below. For example, there is a 40% chance that the demand in Ahmednagar will be 50 units and a 60% chance that the demand will be 70 units. The lines in the figure connecting the locations and warehouse represent two-way roads connecting those places with the distances (in km) shown beside the line. The distances in both the directions along a road are equal. For example, the road from Ahmednagar to Bikrampore and the road from Bikrampore to Ahmednagar are both 6 km long.



Every day the supplier gets the information about the demand values of the four locations and creates the travel route that starts from the warehouse and ends at a location after visiting all the locations exactly once. While making the route plan, the supplier goes to the locations in decreasing order of demand. If there is a tie for the choice of the next location, the supplier will go to the location closest to the current location. Also, while creating the route, the supplier can either follow the direct path (if available) from one location to another or can take the path via the warehouse. If both paths are available (direct and via warehouse), the supplier will choose the path with minimum distance.

If the last location visited is Ahmednagar, then what is the total distance covered in the route (in km)? (in numerical value only)

Question No. : 31

If the total number of widgets delivered in a day is 250 units, then what is the total distance covered in the route (in km)? (in numerical value only)

Question No. : 32

What is the chance that the total number of widgets delivered in a day is 260 units and the route ends at Bikrampore?

- A) 10.80%
- B) 17.64%
- C) 33.33%
- D) 7.56%

Question No. : 33

If the first location visited from the warehouse is Ahmednagar, then what is the chance that the total distance covered in the route is 40 km?

- A) 3.24%
- B) 30%
- C) 18%
- D) 5.4%

Question No. : 34

If Ahmednagar is not the first location to be visited in a route and the total route distance is 29 km, then which of the following is a possible number of widgets delivered on that day?

- A) 220
- B) 210
- C) 200
- D) 250

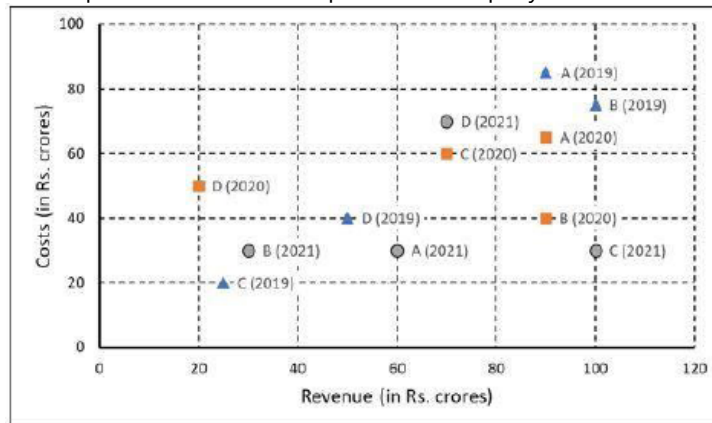
DIRECTIONS for the question: Analyse the graph/s given below and answer the question that follows.

Question No. : 35

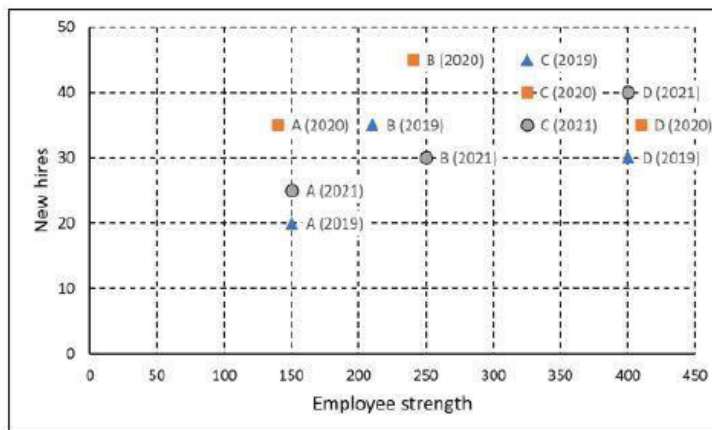
The two plots below show data for four companies code-named A, B, C, and D over three years - 2019, 2020, and 2021.



The first plot shows the revenues and costs incurred by the companies during these years. For example, in 2021, company C earned Rs.100 crores in revenue and spent Rs.30 crores. The profit of a company is defined as its revenue minus its costs.



The second plot shows the number of employees employed by the company (employee strength) at the start of each of these three years, as well as the number of new employees hired each year (new hires). For example, Company B had 250 employees at the start of 2021, and 30 new employees joined the company during the year.



Considering all three years, which company had the highest annual profit?

- A) Company B B) Company C C) Company A D) Company D

Question No. : 36

Which of the four companies experienced the highest annual loss in any of the years?

- A) Company A B) Company C C) Company D D) Company B

Question No. : 37

The ratio of a company's annual profit to its annual costs is a measure of its performance. Which of the four companies had the lowest value of this ratio in 2019?

- A) Company A B) Company B C) Company D D) Company C

Question No. : 38

The total number of employees lost in 2019 and 2020 was the least for:

- A) Company C B) Company B C) Company A D) Company D

Question No. : 39

Profit per employee is the ratio of a company's profit to its employee strength. For this purpose, the employee strength in a year is the average of the employee strength at the beginning of that year and the beginning of the next year. In 2020, which of the four companies had the highest profit per employee?

- A) Company C B) Company B C) Company A D) Company D



DIRECTIONS for the question: Read the information given below and answer the question that follows.

Question No. : 40

A few salesmen are employed to sell a product called TRICCEK among households in various housing complexes. On each day, a salesman is assigned to visit one housing complex. Once a salesman enters a housing complex, he can meet any number of households in the time available. However, if a household makes a complaint against the salesman, then he must leave the housing complex immediately and cannot meet any other household on that day. A household may buy any number of TRICCEK items or may not buy any item. The salesman needs to record the total number of TRICCEK items sold as well as the number of households met in each day. The success rate of a salesman for a day is defined as the ratio of the number of items sold to the number of households met on that day. Some details about the performances of three salesmen - Tohri, Hokli and Lahur, on two particular days are given below.

1. Over the two days, all three of them met the same total number of households, and each of them sold a total of 100 items.
2. On both days, Lahur met the same number of households and sold the same number of items.
3. Hokli could not sell any item on the second day because the first household he met on that day complained against him.
4. Tohri met 30 more households on the second day than on the first day.
5. Tohri's success rate was twice that of Lahur's on the first day, and it was 75% of Lahur's on the second day.

What was the total number of households met by Tohri, Hokli and Lahur on the first day? (in numerical value)

Question No. : 41

How many TRICCEK items were sold by Tohri on the first day? (in numerical value only)

Question No. : 42

How many households did Lahur meet on the second day?

- A) 20 or less B) Between 21 and 29 C) More than 35 D) Between 30 and 35

Question No. : 43

How many households did Tohri meet on the first day?

- A) Between 21 and 40 B) 10 or less C) More than 40 D) Between 11 and 20

Question No. : 44

Which of the following statements is FALSE?

- A) Among the three, Tohri had the highest success rate on the second day.
B) Tohri had a higher success rate on the first day compared to the second day.
C) Among the three, Tohri had the highest success rate on the first day.
D) Among the three, Lahur had the lowest success rate on the first day.

Section : Quantitative Ability

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 45

Let $f(x)$ be quadratic polynomial in x such that $f(x) \geq 0$ for all real numbers x . if $f(2) = 0$ and $f(4) = 6$, then $f(-2)$ is equal to

- A) 12 B) 36 C) 24 D) 6

Question No. : 46



The number of integer solutions of the equation $(x^2 - 10)^{x^2 - 3x - 10} = 1$ is
(in numerical value only)

Question No. : 47

Manu earns Rs. 4000 per month and wants to save an average of Rs. 550 per month in a year. In the first nine months, his monthly expense was Rs. 3500, and he foresees that, tenth month onward, his monthly expense will increase to Rs. 3700. In order to meet his yearly savings target, his monthly earnings, in rupees, from the tenth month onward should be

- A) 4350 B) 4200 C) 4300 D) 4400

Question No. : 48

Working alone, the times taken by Anu, Tanu and Manu to complete any job are in the ratio 5 : 8 : 10. They accept a job which they can finish in 4 days if they all work together for 8 hours per day. However, Anu and Tanu work together for the first 6 days, working 6 hours 40 minutes per day. Then, the number of hours that Manu will take to complete the remaining job working alone is (in numerical value only)

Question No. : 49

Five students, including Amit, appear for an examination in which possible marks are integers between 0 and 50, both inclusive. The average marks for all the students is 38 and exactly three students got more than 32. If no two students got the same marks and Amit got the least marks among the five students, then the difference between the highest and lowest possible marks of Amit is

- A) 21 B) 20 C) 24 D) 22

Question No. : 50

In an examination, there were 75 questions. 3 marks were awarded for each correct answer, 1 mark was deducted for each wrong answer and 1 mark was awarded for each unattempted question. Rayan scored a total of 97 marks in the examination. If the number of unattempted questions was higher than the number of attempted questions, then the maximum number of correct answers that Rayan could have given in the examination is (in numerical value only)

Question No. : 51

Regular polygons A and B have number of sides in the ratio 1 : 2 and interior angles in the ratio 3 : 4. Then the number of sides of B equals (in numerical value only)

Question No. : 52

There are two containers of the same volume, first container half-filled with sugar syrup and the second container half-filled with milk. Half the content of the first container is transferred to the second container, and then the half of this mixture is transferred back to the first container. Next, half the content of the first container is transferred back to the second container. Then the ratio of sugar syrup and milk in the second container is

- A) 6 : 5 B) 5 : 4 C) 5 : 6 D) 4 : 5

Question No. : 53

Two ships meet mid-ocean, and then, one ship goes south and the other ship goes west, both travelling at constant speeds. Two hours later, they are 60 km apart. If the speed of one of the ships is 6 km per hour more than the other one, then the speed, in km per hour, of the slower ship is

- A) 24 B) 18 C) 12 D) 20

Question No. : 54

The length of each side of an equilateral triangle ABC is 3cm. Let D be a point on BC such that the area of triangle ADC is half the area of triangle ABD. Then the length of AD, in cm, is

- A) $\sqrt{7}$ B) $\sqrt{5}$ C) $\sqrt{8}$ D) $\sqrt{6}$

**Question No. : 55**

The number of integers greater than 2000 that can be formed with the digits 0, 1, 2, 3, 4, 5, using each digit at most once, is

- A) 1200 B) 1420 C) 1440 D) 1480

Question No. : 56

Let r and c be real numbers, if r and $-r$ are roots of $5x^3 + cx^2 - 10x + 9 = 0$, then c equals

- A) 4 B) $-\frac{9}{2}$ C) $\frac{9}{2}$ D) -4

Question No. : 57

On day one, there are 100 particles in laboratory experiment. On day n , where $n \geq 2$, one out of every n particles produces another particle. If the total number of particles in the laboratory experiment increases to 1000 on day m , then m equals.

- A) 19 B) 16 C) 17 D) 18

Question No. : 58

In an election, there were four candidates and 80% of the registered voters casted their votes. One of the candidates received 30% of the casted votes while the other three candidates received the remaining casted votes in the proportion 1 : 2 : 3. If the winner of the election received 2512 votes more than the candidate with the second highest votes, then the number of registered voters was

- A) 40192 B) 62800 C) 50240 D) 60288

Question No. : 59

In triangle ABC, altitudes AD and BE are drawn to the corresponding bases.

If $\angle BAC = 45^\circ$ and $\angle ABC = \theta$, then $\frac{AD}{BE}$ equals

- A) $\sqrt{2} \cos \theta$ B) 1 C) $\frac{(\sin \theta + \cos \theta)}{\sqrt{2}}$ D) $\sqrt{2} \sin \theta$

Question No. : 60

Mr. Pinto invests one-fifth of his capital at 6%, one-third at 10% and the remaining at 1%, each rate being simple interest per annum. Then, the minimum number of years required for the cumulative interest income from these investments to equal or exceed his initial capital is (in numerical value only)

Question No. : 61

For some natural number n , assume that $(15,000)!$ is divisible by $(n!)!$. The largest possible value of n is

- A) 5 B) 7 C) 6 D) 4

Question No. : 62

The average of a non-decreasing sequence of N numbers a_1, a_2, \dots, a_N is 300. If a_1 is replaced by $6a_1$, the new average becomes 400. Then, the number of possible values of a_1 is (in numerical value only)

Question No. : 63

Consider the arithmetic progression 3, 7, 11, and let A_n denote the sum of the first n terms of this progression.

Then the value of $\frac{1}{25} \sum_{n=1}^{25} A_n$ is

- A) 415 B) 442 C) 455 D) 404

Question No. : 64



Suppose for all integers x , there are two function f and g such that $f(x) + f(x-1) - 1 = 0$ and $g(x) = x^2$. If $f(x^2 - x) = 5$, then the value of the sum $f(g(5)) + g(f(5))$ is (in numerical value only)

Question No. : 65

The number of distinct integer values of n satisfying $\frac{4 - \log_2 n}{3 - \log_4 n} < 0$, is

(in numerical value only)

Question No. : 66

If a and b are non-negative real numbers such that $a + 2b = 6$, then the average of the maximum and minimum possible values of $(a + b)$ is

- A) 3 B) 4.5 C) 3.5 D) 4
-

**Directions of Test**

Test Name	Actual CAT 2022 Slot II	Total Questions	66	Total Time	120 Mins
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Section Name	No. of Questions	Time limit	Marks per Question	Negative Marking
Verbal Ability	24	0:40(h:m)	3	1/3
DI & Reasoning	20	0:40(h:m)	3	1/3
Quantitative Ability	22	0:40(h:m)	3	1/3

Section : Verbal Ability**QNo:- 1 ,Correct Answer:- C**

Explanation:- We are supposed to choose that option which shows octopuses are not really misfit among the class of 'cephalopods'. Refer to the first and second paragraph. 'Octopuses' just like other cephalopods are consumed not only by sea predators but also humans. So the right answer choice is option 'C'. Rest all other options make it a misfit.

QNo:- 2 ,Correct Answer:- B

Explanation:- Option 'B' can't be deduced from the passage. No where in the passage was this fact given that they can take colour of their predators. So statement given in option 'B' is not true about the camouflaging ability of the octopuses.

They simply take colours and sometimes textures of their surrounding to hide themselves. Hence rest of the options are true with respect to the passage.

QNo:- 3 ,Correct Answer:- A

Explanation:- Refer to the opening of introductory paragraph, "**They belong to Mollusca class Cephalopoda.....most are shelled invertebrates with a dorsal foot.**" And from the second passage we understand that in spite of lacking a shell covering them, they have other ways to save/hide themselves from the predators. So from all these facts we can infer that octopuses are most dissimilar to 'A'-sea snails.

QNo:- 4 ,Correct Answer:- D

Explanation:- Option 'D' provides us the statement that wouldn't weaken the camouflaging adeptness of cephalopods. This statement shows a situation where at least all the three cells- chromatophores, iridophores and leucophores are present which help the cephalopods in camouflaging themselves.

Camouflaging adeptness would be difficult if in the depths of sea radial muscle movements or transmission of neural signals become difficult. So option 'A' and 'B' get ruled out.

Refer to the third paragraph- "Chromatophores are organs.....brown pigment granules." So the third colour is brown not green. It (C) also weakens the camouflaging adeptness of cephalopods.

QNo:- 5 ,Correct Answer:- D

Explanation:- In the given passage, the author is critical of engineering education without the consideration of nontechnical aspects, such as cultural-social implications and potential harms of introducing the technological solutions. Engineering students have been taught to come up with 'best' technical innovations grounded in math



and science, eventually relegating them to 'objectivity'.

So the appropriate claim made by the author is provided by option 'D'.

Rest all other options are supporting or appreciating the present engineering education, which is contrary to facts given in the passage. So they can be negated.

QNo:- 6 ,Correct Answer:- C

Explanation:- Except option 'C' all other options talk about how the dominant or privileged segments play the role of decision-makers, without considering its consequences on the marginalized section.

Whereas, option 'C' only highlights the sustainability of the devices built and their contribution towards greenhouse gas emissions, which will affect everyone equally, irrespective of social and economic differences.

QNo:- 7 ,Correct Answer:- C

Explanation:- Except option 'C', all other options explore the exploitation of technical aspects of medical science in an unjust way.

Option 'C' talks about incorrect assignment of people as female at birth which is a doing of humans only and technical ideals can't be blamed for it.

QNo:- 8 ,Correct Answer:- B

Explanation:- We are supposed to guess, which option doesn't add credence to author's suggestions about evolving engineering pedagogy. The right answer to this should be option 'B'. Refer to the first paragraph of the passage-

"This way of teaching.....solution process"; shows that technical-social dualism should be avoided and in fact the two should be integrated in engineering for better sustainable results.

As option 'A', 'C' and 'D' all discuss involving environmental sustainability, needs of all the communities and a more responsible approach to technical design and problem solving respectively; author would approve of these.

QNo:- 9 ,Correct Answer:- A

Explanation:- The first paragraph discussed two terms- '**humans**' and their natural inclination towards '**musicking**'. Second passage explored link between musical and non musical capacities like '**linguistic capacity**'.

Third paragraph was based on how humans are '**symbol-makers**' too. And the last paragraph discussed '**modern humans**' and their renewed interest in musicking. So the right option which mentions all these terms is option 'A'.

Rest all other options fail to take into account one or the other of these terms.

QNo:- 10 ,Correct Answer:- A

Explanation:- The only option that discusses the emergence of music/musicking is option 'A'. Rest all other options simply explore different aspects of musicking.

QNo:- 11 ,Correct Answer:- A

Explanation:- Throughout the passage the author tries to put forward this idea that humans are musicking creatures by default, irrespective of socio-cultural differences. So author is most likely to disagree with option 'A', hence it is the weakening sentence.



QNo:- 12 ,Correct Answer:- B

Explanation:- According to the passage the author's point of view is that not a particular human can make music but all do. The same is supported in the first paragraph and is highlighted in option 'B'.

QNo:- 13 ,Correct Answer:- B

Explanation:- Refer to the first two lines of the first paragraph, "**We begin with the emergence.....social institutions.**" Clearly by 'arena of thought' author was referring to social science as being academic discipline. He states that social academic disciplines and institutions overlap each other. Option 1 and 4 are ambiguous and can't be deduced from the passage. Option 3, talks about one and the same thing, so comparing the two as overlapping each other is illogical.

QNo:- 14 ,Correct Answer:- B

Explanation:- We have to state which of the given options can be a true inference based on the facts given in the passage. Refer to the second last sentence of the last paragraph- "**Natural languages are typical....., but not the execution of any human design**", shows that natural languages were not consciously developed or designed by the humans. So 'B' is the best answer.

Institutions of 'friendship' and 'joint stock' are completely two different arenas and are incomparable, so option 'A' can be ruled out.

Option 'C' is also false, because all the institutions mentioned in it are in fact a result of conscious human action.

Option 'D' can also be negated as, 'culture' and 'tradition' are actually analytically isolated for explanatory and expository purposes. Refer to opening of second paragraph.

QNo:- 15 ,Correct Answer:- A

Explanation:- Right explanation of the line given in the question is provided by option 'A'. Refer to the second-half of the first paragraph, "**There are some institutions..... to be precise mixtures are the norm.**" 'Stock exchange' and 'black market' are both part of market domain, yet one is formal and other, informal. Rest all other options provide faulty interpretation of the given line, so they can be ruled out.

QNo:- 16 ,Correct Answer:- D

Explanation:- We are supposed to find out essence, that is the main idea of the passage. Option 'D' provides the right answer. Throughout the passage author has promulgated this idea that 'institutions' do not develop on their own in isolation. They are in fact layered with human's interventions and are intertwined with other institutions. Rest all other options provides individual examples of 'language', 'culture & tradition' and 'stock exchange & black market', to further reinforce the idea put forward by the author.

QNo:- 17 ,Correct Answer:- 2143

Explanation:- sentence 2 introduces that the issue of biodiversity loss and ecosystem collapse is caused due to several reasons. 2 and 1 are a pair. option 1 and 4 are pair as 4 carries forward the idea that there is no single tech solution to deal with this crisis.

option 3 concludes the passage by preventing the active involvement of judiciary in these matters.

QNo:- 18 ,Correct Answer:- 3142

Explanation:- 3 introduces the state of cheerfulness linked with its effect on inner soul. 2 further sets forth the



same idea by conveying about the genesis of this word. 4 and 2 are chrono pairs and also 2 concludes the passage by talking about the expansion of the meaning of this expression after the translations of the Bible.

QNo:- 19 ,Correct Answer:- 2431

Explanation:- 2 introduces the topic of food choices solely being governed by individual choices.

4 and 3 are cause-effect pair, also 4 continues the idea from 2 and 3 logically follows 4, as it further gives reasons for this liberty of choosing what to eat.

1 is plausibly the last sentence, because it narrows down the idea of governing food systems, specifically talking about women's role in it.

QNo:- 20 ,Correct Answer:- D

Explanation:- the correct option should be option 4. the passage talks about reasons for USP of 'Aage Badhein app.'

It stresses upon the fact that customization of the app according to the needs of the user, the main reason for its success.

In the concluding part, the author's focus narrows down to rural and then household women who financially benefited from the app; which is a big thing because this is the group least likely to have had exposure to such digital platforms. Hence, the sentence would most strongly and plausibly fit in 4th blank.

QNo:- 21 ,Correct Answer:- C

Explanation:- The correct option is 3 as the passage focuses on tracing the trajectory of use/popularity of one of the most important ingredients of Indian cuisine "Ghee" from first going down in late 20th and early 21st century. Surprisingly going up in last few years, and especially during the pandemic. The author is most likely to place the given sentence in blank 3, because in the line preceding it, he has talked about the renewed interest in use of Ghee. Chronologically its boom in pandemic-time would come next.

QNo:- 22 ,Correct Answer:- D

Explanation:- Option Band C can easily be eliminated because they either talk about only one aspect of the passage or have misinterpreted the idea of successful early non-hierarchical egalitarian societies respectively. However, option A and D are more convincingly correct summaries, as they both talk about successful egalitarian societies in some ancient cities without the intervention of hierarchical, political or civic organizations.

But option (D) is a more appropriate and convincing choice, as it talks of the 'evidence' in support of these claims and not mere 'assumptions' option (A)

QNo:- 23 ,Correct Answer:- B

Explanation:- Option B includes all the principal subjects hence is the most appropriate summary.

A doesn't take the point of threat to freedom and privacy into account.

C and D though reflect this point of freedom and privacy, it missed out on the point of taking same war-time psychological and behavioural manipulation into consideration.

QNo:- 24 ,Correct Answer:- A

Explanation:- The 3 options B, C and D are more or less imposing on the museums, the responsibility of preserving the artworks.

Whereas the passage generally talks about museum artworks and the challenge to preserve them therefore only option A is the best.



Section : DI & Reasoning

QNo:- 25 ,Correct Answer:- 40

Explanation:- Total number of domestic products = foreign products = $320/2 = 160$
 Domestic, Cosmetic, FDA approved products = $160/2 = 80$
 Foreign products having both approvals = 0
 Domestic products having both approvals = 60
 Let the number of domestic, cosmetic, both the approvals = x
 \Rightarrow the number of domestic, nutrition, both the approvals = $60 - x$
 Total number of nutrition products = 140
 \Rightarrow total number of cosmetic products = $320 - 140 = 180$
 Number of foreign, nutrition products = 70
 Let number of foreign, nutrition, FDA products = y
 \Rightarrow number of foreign, nutrition, EU products = $70 - y$
 Also, number of foreign, cosmetic products = $160 - 70 = 90$
 Total FDA approved products = 200
 Total foreign, FDA approved products = 70
 Number of foreign, nutrition, FDA products = y
 \Rightarrow number of foreign, cosmetic, FDA products = $70 - y$
 \Rightarrow number of foreign, cosmetic, EU products = $90 - (70 - y) = y + 20$
 Number of cosmetic, FDA approved products = 120
 \Rightarrow number of nutrition, FDA approved products = $200 - 120 = 80$
 \Rightarrow number of domestic, nutrition, FDA approved products = $80 - y$
 The rest of the given information can be gathered as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
Foreign	$70 - y$	$y + 20$	0	90	y	$70 - y$	0	70	160
Domestic	80	$10 + x$	x	90	$80 - y$	$50 - x + y$	$60 - x$	70	160
Total	120	$x + y + 30$	x	180	80	$120 - x$	$60 - x$	140	320

Solving, $70 - y + 80 = 120 \Rightarrow y = 30$
 The information can be updated as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
Foreign	40	50	0	90	30	40	0	70	160
Domestic	80	$10 + x$	x	90	50	$80 - x$	$60 - x$	70	160
Total	120	$60 + x$	x	180	80	$120 - x$	$60 - x$	140	320

Now we can answer the questions

The number of foreign products that were FDA approved cosmetic products = 40

QNo:- 26 ,Correct Answer:- C

Explanation:- Total number of domestic products = foreign products = $320/2 = 160$
 Domestic, Cosmetic, FDA approved products = $160/2 = 80$
 Foreign products having both approvals = 0
 Domestic products having both approvals = 60
 Let the number of domestic, cosmetic, both the approvals = x
 \Rightarrow the number of domestic, nutrition, both the approvals = $60 - x$
 Total number of nutrition products = 140



=> total number of cosmetic products = $320 - 140 = 180$

Number of foreign, nutrition products = 70

Let number of foreign, nutrition, FDA products = y

=> number of foreign, nutrition, EU products = $70 - y$

Also, number of foreign, cosmetic products = $160 - 70 = 90$

Total FDA approved products = 200

Total foreign, FDA approved products = 70

Number of foreign, nutrition, FDA products = y

=> number of foreign, cosmetic, FDA products = $70 - y$

=> number of foreign, cosmetic, EU products = $90 - (70 - y) = y + 20$

Number of cosmetic, FDA approved products = 120

=> number of nutrition, FDA approved products = $200 - 120 = 80$

=> number of domestic, nutrition, FDA approved products = $80 - y$

The rest of the given information can be gathered as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
Foreign	$70 - y$	$y + 20$	0	90	y	$70 - y$	0	70	160
Domestic	80	$10 + x$	x	90	$80 - y$	$50 - x + y$	$60 - x$	70	160
Total	120	$x + y + 30$	x	180	80	$120 - x$	$60 - x$	140	320

Solving, $70 - y + 80 = 120 \Rightarrow y = 30$

The information can be updated as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
Foreign	40	50	0	90	30	40	0	70	160
Domestic	80	$10 + x$	x	90	50	$80 - x$	$60 - x$	70	160
Total	120	$60 + x$	x	180	80	$120 - x$	$60 - x$	140	320

Now we can answer the questions

The number of cosmetic products which have FDA approval = 120

The number of cosmetic products which did not have FDA approval = $180 - 120 = 60$

QNo:- 27 ,Correct Answer:- A

Explanation:- Total number of domestic products = foreign products = $320/2 = 160$

Domestic, Cosmetic, FDA approved products = $160/2 = 80$

Foreign products having both approvals = 0

Domestic products having both approvals = 60

Let the number of domestic, cosmetic, both the approvals = x

=> the number of domestic, nutrition, both the approvals = $60 - x$

Total number of nutrition products = 140

=> total number of cosmetic products = $320 - 140 = 180$

Number of foreign, nutrition products = 70

Let number of foreign, nutrition, FDA products = y

=> number of foreign, nutrition, EU products = $70 - y$

Also, number of foreign, cosmetic products = $160 - 70 = 90$

Total FDA approved products = 200

Total foreign, FDA approved products = 70

Number of foreign, nutrition, FDA products = y

=> number of foreign, cosmetic, FDA products = $70 - y$

=> number of foreign, cosmetic, EU products = $90 - (70 - y) = y + 20$

Number of cosmetic, FDA approved products = 120

=> number of nutrition, FDA approved products = $200 - 120 = 80$



=> number of domestic, nutrition, FDA approved products = $80 - y$

The rest of the given information can be gathered as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
Foreign	$70 - y$	$y + 20$	0	90	y	$70 - y$	0	70	160
Domestic	80	$10 + x$	x	90	$80 - y$	$50 - x + y$	$60 - x$	70	160
Total	120	$x + y + 30$	x	180	80	$120 - x$	$60 - x$	140	320

Solving, $70 - y + 80 = 120 \Rightarrow y = 30$

The information can be updated as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
Foreign	40	50	0	90	30	40	0	70	160
Domestic	80	$10 + x$	x	90	50	$80 - x$	$60 - x$	70	160
Total	120	$60 + x$	x	180	80	$120 - x$	$60 - x$	140	320

Now we can answer the questions

No value of region can be negative => $60 - x \geq 0 \Rightarrow x \leq 60$

The number of domestic, cosmetic products that had both the approvals = x is at most 60

Hence, the best represents is at least 10 and at most 60

QNo:- 28 ,Correct Answer:- A

Explanation:- Total number of domestic products = foreign products = $320/2 = 160$

Domestic, Cosmetic, FDA approved products = $160/2 = 80$

Foreign products having both approvals = 0

Domestic products having both approvals = 60

Let the number of domestic, cosmetic, both the approvals = x

=> the number of domestic, nutrition, both the approvals = $60 - x$

Total number of nutrition products = 140

=> total number of cosmetic products = $320 - 140 = 180$

Number of foreign, nutrition products = 70

Let number of foreign, nutrition, FDA products = y

=> number of foreign, nutrition, EU products = $70 - y$

Also, number of foreign, cosmetic products = $160 - 70 = 90$

Total FDA approved products = 200

Total foreign, FDA approved products = 70

Number of foreign, nutrition, FDA products = y

=> number of foreign, cosmetic, FDA products = $70 - y$

=> number of foreign, cosmetic, EU products = $90 - (70 - y) = y + 20$

Number of cosmetic, FDA approved products = 120

=> number of nutrition, FDA approved products = $200 - 120 = 80$

=> number of domestic, nutrition, FDA approved products = $80 - y$

The rest of the given information can be gathered as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
Foreign	$70 - y$	$y + 20$	0	90	y	$70 - y$	0	70	160
Domestic	80	$10 + x$	x	90	$80 - y$	$50 - x + y$	$60 - x$	70	160
Total	120	$x + y + 30$	x	180	80	$120 - x$	$60 - x$	140	320

Solving, $70 - y + 80 = 120 \Rightarrow y = 30$



The information can be updated as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
Foreign	40	50	0	90	30	40	0	70	160
Domestic	80	10 + x	x	90	50	80 - x	60 - x	70	160
Total	120	60 + x	x	180	80	120 - x	60 - x	140	320

Now we can answer the questions

The number of cosmetic products that did not have EU approval = 70

$$\Rightarrow 180 - (60 + x) = 70 \Rightarrow x = 50$$

The number of nutrition products that had both the approvals = $60 - x = 10$

QNo:- 29 ,Correct Answer:- 50

Explanation:- Total number of domestic products = foreign products = $320/2 = 160$

Domestic, Cosmetic, FDA approved products = $160/2 = 80$

Foreign products having both approvals = 0

Domestic products having both approvals = 60

Let the number of domestic, cosmetic, both the approvals = x

\Rightarrow the number of domestic, nutrition, both the approvals = $60 - x$

Total number of nutrition products = 140

\Rightarrow total number of cosmetic products = $320 - 140 = 180$

Number of foreign, nutrition products = 70

Let number of foreign, nutrition, FDA products = y

\Rightarrow number of foreign, nutrition, EU products = $70 - y$

Also, number of foreign, cosmetic products = $160 - 70 = 90$

Total FDA approved products = 200

Total foreign, FDA approved products = 70

Number of foreign, nutrition, FDA products = y

\Rightarrow number of foreign, cosmetic, FDA products = $70 - y$

\Rightarrow number of foreign, cosmetic, EU products = $90 - (70 - y) = y + 20$

Number of cosmetic, FDA approved products = 120

\Rightarrow number of nutrition, FDA approved products = $200 - 120 = 80$

\Rightarrow number of domestic, nutrition, FDA approved products = $80 - y$

The rest of the given information can be gathered as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
Foreign	70 - y	y + 20	0	90	y	70 - y	0	70	160
Domestic	80	10 + x	x	90	80 - y	50 - x + y	60 - x	70	160
Total	120	x + y + 30	x	180	80	120 - x	60 - x	140	320

Solving, $70 - y + 80 = 120 \Rightarrow y = 30$

The information can be updated as follows-

	Cosmetic				Nutrition				Total
	FDA	EU	Both	Either	FDA	EU	Both	Either	
Foreign	40	50	0	90	30	40	0	70	160
Domestic	80	10 + x	x	90	50	80 - x	60 - x	70	160
Total	120	60 + x	x	180	80	120 - x	60 - x	140	320

Now we can answer the questions



The number of nutrition products that did not have EU approval = 50

$$\Rightarrow 140 - (120 - x) = 50 \Rightarrow x = 30$$

The number of domestic, cosmetic products that did not have EU approval

$$= 90 - (10 + x) = 50$$

QNo:- 30 ,Correct Answer:- 35

Explanation:-

Case	A	B	C	D	Total
1	50	40	70	30	190
2	50	40	70	50	210
3	50	40	100	30	220
4	50	40	100	50	240
5	50	60	70	30	210
6	50	60	70	50	230
7	50	60	100	30	240
8	50	60	100	50	260
9	70	40	70	30	210
10	70	40	70	50	230
11	70	40	100	30	240
12	70	40	100	50	260
13	70	60	70	30	230
14	70	60	70	50	250
15	70	60	100	30	260
16	70	60	100	50	280

While making the route plan, the supplier goes to the locations in decreasing order of demand and if the last location is Ahmednagar, then it must have least demand (50 units)

So, the supplier must have supplied the order in the following manner-

C (70 or 100 units) > B (60 units) > D (50 units) ≥ A (50 units)

The total distance (minimum) covered $W - C - B - W - D - W - A$

$$= 12 + 4 + 10 + 2 + 2 + 5 = 35 \text{ km}$$

QNo:- 31 ,Correct Answer:- 38

Explanation:-

Case	A	B	C	D	Total
1	50	40	70	30	190
2	50	40	70	50	210
3	50	40	100	30	220
4	50	40	100	50	240
5	50	60	70	30	210
6	50	60	70	50	230
7	50	60	100	30	240
8	50	60	100	50	260
9	70	40	70	30	210



10	70	40	70	50	230
11	70	40	100	30	240
12	70	40	100	50	260
13	70	60	70	30	230
14	70	60	70	50	250
15	70	60	100	30	260
16	70	60	100	50	280

The total number of widgets delivered in a day = 250 units

Only possible combination,

$A (70 \text{ units}) + B (60 \text{ units}) + C (70 \text{ units}) + D (50 \text{ units}) = 250 \text{ units}$

Order of delivery, $A (70 \text{ units}) \geq C (70 \text{ units}) > B (60 \text{ units}) > D (50 \text{ units})$

The total distance (minimum) covered $W - A - W - C - B - W - D$

$= 5 + 5 + 12 + 4 + 10 + 2 = 38 \text{ km}$

QNo:- 32 ,Correct Answer:- D

Explanation:-

Case	A	B	C	D	Total
1	50	40	70	30	190
2	50	40	70	50	210
3	50	40	100	30	220
4	50	40	100	50	240
5	50	60	70	30	210
6	50	60	70	50	230
7	50	60	100	30	240
8	50	60	100	50	260
9	70	40	70	30	210
10	70	40	70	50	230
11	70	40	100	30	240
12	70	40	100	50	260
13	70	60	70	30	230
14	70	60	70	50	250
15	70	60	100	30	260
16	70	60	100	50	280

The total number of widgets delivered in a day = 260 units

Also, the route ends at Bikrampore, only order possible

$C (100 \text{ units}) > A (70 \text{ units}) > D (50 \text{ units}) > B (40 \text{ units})$

Required chance = $70\% \times 60\% \times 60\% \times 30\% = 7.56\%$

QNo:- 33 ,Correct Answer:- C

Explanation:-

Case	A	B	C	D	Total
1	50	40	70	30	190



2	50	40	70	50	210
3	50	40	100	30	220
4	50	40	100	50	240
5	50	60	70	30	210
6	50	60	70	50	230
7	50	60	100	30	240
8	50	60	100	50	260
9	70	40	70	30	210
10	70	40	70	50	230
11	70	40	100	30	240
12	70	40	100	50	260
13	70	60	70	30	230
14	70	60	70	50	250
15	70	60	100	30	260
16	70	60	100	50	280

If the first location visited from the warehouse is Ahmednagar, possible cases

Case	A	B	C	D	Total
9th	70	40	70	30	210
Distance covered W – A – W – C – B – W – D = 5 + 5 + 12 + 4 + 10 + 2 = 38 km A (70 units) ≥ C (70 units) > B (40 units) > D (30 units) Chance = 60% × 30% × 30% × 40% = 2.16%					
10th	70	40	70	50	230
Distance covered W – A – W – C – D – W – B = 5 + 5 + 12 + 6 + 2 + 10 = 40 km A (70 units) ≥ C (70 units) > D (50 units) > B (40 units) Chance = 60% × 30% × 60% × 30% = 3.24%					
13th	70	60	70	30	230
Distance covered W – A – W – C – B – W – D = 5 + 5 + 12 + 4 + 10 + 2 = 38 km A (70 units) ≥ C (70 units) > B (60 units) > D (30 units) Chance = 60% × 30% × 70% × 40% = 5.04%					
14th	70	60	70	50	250
Distance covered W – A – W – C – B – W – D = 5 + 5 + 12 + 4 + 10 + 2 = 38 km A (70 units) ≥ C (70 units) > B (60 units) > D (50 units) Chance = 60% × 30% × 70% × 60% = 7.56%					

Total chance = 2.16% + 3.24% + 5.04% + 7.56% = 18%

The chance that the total distance covered is 40 km

= 3.24%/18% × 100 = 18%

QNo:- 34 ,Correct Answer:- B

Explanation:-

Case	A	B	C	D	Total



1	50	40	70	30	190
2	50	40	70	50	210
3	50	40	100	30	220
4	50	40	100	50	240
5	50	60	70	30	210
6	50	60	70	50	230
7	50	60	100	30	240
8	50	60	100	50	260
9	70	40	70	30	210
10	70	40	70	50	230
11	70	40	100	30	240
12	70	40	100	50	260
13	70	60	70	30	230
14	70	60	70	50	250
15	70	60	100	30	260
16	70	60	100	50	280

If Ahmednagar is not the first location to be visited in a route, possible cases

Case	A	B	C	D	Total
1	50	40	70	30	190
Distance covered W – C – W – A – B – W – D = 12 + 12 + 5 + 6 + 10 + 2 = 47 km					
2	50	40	70	50	210
Distance covered W – C – D – W – A – B = 12 + 6 + 2 + 5 + 6 = 31 km					
3	50	40	100	30	220
Distance covered W – C – W – A – B – W – D = 12 + 12 + 5 + 6 + 10 + 2 = 47 km					
4	50	40	100	50	240
Distance covered W – C – D – W – A – B = 12 + 6 + 2 + 5 + 6 = 31 km					
5	50	60	70	30	210
Distance covered W – C – B – A – W – D = 12 + 4 + 6 + 5 + 2 = 29 km					
6	50	60	70	50	230
Distance covered W – C – B – A – W – D = 12 + 4 + 6 + 5 + 2 = 29 km					
7	50	60	100	30	240
Distance covered W – C – B – A – W – D = 12 + 4 + 6 + 5 + 2 = 29 km					
8	50	60	100	50	260
Distance covered W – C – B – A – W – D = 12 + 4 + 6 + 5 + 2 = 29 km					
11	70	40	100	30	240
Distance covered W – C – W – A – B – W – D					



$= 12 + 12 + 5 + 6 + 10 + 2 = 47 \text{ km}$					
12	70	40	100	50	260
Distance covered W – C – W – A – W – D – W – B $= 12 + 12 + 5 + 5 + 2 + 2 + 10 + 10 = 58 \text{ km}$					
15	70	60	100	30	260
Distance covered W – C – W – A – B – W – D $= 12 + 12 + 5 + 6 + 10 + 2 = 47 \text{ km}$					
16	70	60	100	50	280
Distance covered W – C – W – A – B – W – D $= 12 + 12 + 5 + 6 + 10 + 2 = 47 \text{ km}$					

The total route distance is 29 km is in 5th, 6th, 7th and 8th case having widgets delivered 210, 230, 240 and 260 respectively

The only possible value among options is 210

QNo:- 35 ,Correct Answer:- B

Explanation:- The given information can be gathered as follows

Year →	2019				2020				2021			
Particular ↓	A	B	C	D	A	B	C	D	A	B	C	D
Revenue (in Rs. Crores)	90	100	23	50	90	90	70	20	60	30	100	70
Cost (in Rs. Crores)	85	75	20	40	65	40	60	50	30	30	30	70
Profit (in Rs. Crores)	5	25	3	10	25	50	10	-30	30	0	70	0
Employee Strength	150	210	325	400	140	240	325	410	150	250	325	400
New Hires	20	35	45	30	35	45	40	35	25	30	35	40

Now we can answer the questions

Considering all the three years,

Profit of Company C in 2021 = 70 crores is the highest annual profit

QNo:- 36 ,Correct Answer:- C

Explanation:- The given information can be gathered as follows

Year →	2019				2020				2021			
Particular ↓	A	B	C	D	A	B	C	D	A	B	C	D
Revenue (in Rs. Crores)	90	100	23	50	90	90	70	20	60	30	100	70
Cost (in Rs. Crores)	85	75	20	40	65	40	60	50	30	30	30	70
Profit (in Rs. Crores)	5	25	3	10	25	50	10	-30	30	0	70	0



Employee Strength	150	210	325	400	140	240	325	410	150	250	325	400
New Hires	20	35	45	30	35	45	40	35	25	30	35	40

Now we can answer the questions

Loss of Company D in 2020 = 30 crores is the highest annual loss in any of the years

QNo:- 37 ,Correct Answer:- A

Explanation:- The given information can be gathered as follows

Year →	2019				2020				2021			
Particular ↓	A	B	C	D	A	B	C	D	A	B	C	D
Revenue (in Rs. Crores)	90	100	23	50	90	90	70	20	60	30	100	70
Cost (in Rs. Crores)	85	75	20	40	65	40	60	50	30	30	30	70
Profit (in Rs. Crores)	5	25	3	10	25	50	10	-30	30	0	70	0
Employee Strength	150	210	325	400	140	240	325	410	150	250	325	400
New Hires	20	35	45	30	35	45	40	35	25	30	35	40

Now we can answer the questions

Performance = Annual Profit / Annual Cost

For year 2019,

Performance of A = $5/85 = 1/17$

Performance of B = $25/75 = 1/3$

Performance of C = $3/20$

Performance of D = $10/40 = 1/4$

Hence, the company that had the lowest performance ratio is company A

QNo:- 38 ,Correct Answer:- B

Explanation:- The given information can be gathered as follows

Year →	2019				2020				2021			
Particular ↓	A	B	C	D	A	B	C	D	A	B	C	D
Revenue (in Rs. Crores)	90	100	23	50	90	90	70	20	60	30	100	70
Cost (in Rs. Crores)	85	75	20	40	65	40	60	50	30	30	30	70
Profit (in Rs. Crores)	5	25	3	10	25	50	10	-30	30	0	70	0
Employee Strength	150	210	325	400	140	240	325	410	150	250	325	400
New Hires	20	35	45	30	35	45	40	35	25	30	35	40



Now we can answer the questions

Total number of employees lost in any year = Employee strength in that year + New Hires in that year – Employee strength in next year

	Total number of employees lost in		
	2019	2020	Total
Company A	$150 + 20 - 140 = 30$	$140 + 35 - 150 = 25$	55
Company B	$210 + 35 - 240 = 5$	$240 + 45 - 250 = 35$	40
Company C	$325 + 45 - 325 = 45$	$325 + 40 - 325 = 40$	85
Company D	$400 + 30 - 410 = 20$	$410 + 35 - 400 = 45$	65

The total number of employees lost in 2019 and 2020 was least for company B

QNo:- 39 ,Correct Answer:- B

Explanation:- The given information can be gathered as follows

Year →	2019				2020				2021			
	A	B	C	D	A	B	C	D	A	B	C	D
Revenue (in Rs. Crores)	90	100	23	50	90	90	70	20	60	30	100	70
Cost (in Rs. Crores)	85	75	20	40	65	40	60	50	30	30	30	70
Profit (in Rs. Crores)	5	25	3	10	25	50	10	-30	30	0	70	0
Employee Strength	150	210	325	400	140	240	325	410	150	250	325	400
New Hires	20	35	45	30	35	45	40	35	25	30	35	40

Now we can answer the questions

For year 2020,

	Profit	Employee strength	Profit per employee
Company A	25	$(140 + 150)/2 = 145$	$25/145 = 100/580$
Company B	50	$(240 + 250)/2 = 245$	$50/245 = 100/490$
Company C	10	$(325 + 325)/2 = 325$	$10/325 = 100/3250$
Company D	-30	$(410 + 400)/2 = 405$	$-30/405$

Hence, for year 2020, company B had the highest profit per employee

QNo:- 40 ,Correct Answer:- 84

Explanation:- Let the total number of households each met over the two days = 2h

Total number of items sold by each over the two days = 100

Let the number of TRICCEK sold on day 1 by Tohri = n

=> the number of TRICCEK sold on day 2 by Tohri = 100 – n

The rest of the information can be gathered as follows

Name	Particular	Day 1	Day 2	Total



	Number of TRICCEK sold	n	100 – n	100
Tohri	Number of households met	h – 15	h + 15	2h
	Success Rate	$n/(h - 15)$	$(100 - n)/(h + 15)$	
	Number of TRICCEK sold	100	0	100
Hokli	Number of households met	2h – 1	1	2h
	Success Rate	$100/(2h - 1)$	0	
	Number of TRICCEK sold	50	50	100
Lahur	Number of households met	h	h	2h
	Success Rate	50/h	50/h	

Tohri's success rate was twice that of Lahur's on the first day,

$$\Rightarrow n/(h - 15) = 2 \times (50/h)$$

$$\text{Solving, } nh = 100h - 1500$$

Also, Tohri's success rate was 75% of Lahur's on the second day,

$$\Rightarrow (100 - n)/h + 15 = (75/100) \times (50/h)$$

$$\text{Solving, } 200h - 2nh = 75h + 1125$$

Substituting the value of nh,

$$\Rightarrow 200h - 2(100h - 1500) = 75h + 1125$$

$$\Rightarrow 3000 = 75h + 1125 \Rightarrow h = 25$$

Substituting again,

$$25n = 2500 - 1500 = 1000 \Rightarrow n = 40$$

Name	Particular	Day 1	Day 2	Total
	Number of TRICCEK sold	40	60	100
Tohri	Number of households met	10	40	50
	Success Rate	4	1.5	
	Number of TRICCEK sold	100	0	100
Hokli	Number of households met	49	1	50
	Success Rate	2.04	0	
	Number of TRICCEK sold	50	50	100
Lahur	Number of households met	25	25	50
	Success Rate	2	2	

Now we can answer the questions

Total number of households met by Tohri, Hokli and Lahur on the first day

$$= 10 + 49 + 25 = 84$$

QNo:- 41 ,Correct Answer:- 40

Explanation:- Let the total number of households each met over the two days = 2h

Total number of items sold by each over the two days = 100

Let the number of TRICCEK sold on day 1 by Tohri = n

$$\Rightarrow \text{the number of TRICCEK sold on day 2 by Tohri} = 100 - n$$

The rest of the information can be gathered as follows

Name	Particular	Day 1	Day 2	Total
	Number of TRICCEK sold	n	100 – n	100
Tohri	Number of households met	h – 15	h + 15	2h
	Success Rate	$n/(h - 15)$	$(100 - n)/(h + 15)$	



	Number of TRICCEK sold	100	0	100
Hokli	Number of households met	$2h - 1$	1	$2h$
	Success Rate	$100/(2h - 1)$	0	
	Number of TRICCEK sold	50	50	100
Lahur	Number of households met	h	h	$2h$
	Success Rate	$50/h$	$50/h$	

Tohri's success rate was twice that of Lahur's on the first day,

$$\Rightarrow n/(h - 15) = 2 \times (50/h)$$

$$\text{Solving, } nh = 100h - 1500$$

Also, Tohri's success rate was 75% of Lahur's on the second day,

$$\Rightarrow (100 - n)/h + 15 = (75/100) \times (50/h)$$

$$\text{Solving, } 200h - 2nh = 75h + 1125$$

Substituting the value of nh ,

$$\Rightarrow 200h - 2(100h - 1500) = 75h + 1125$$

$$\Rightarrow 3000 = 75h + 1125 \Rightarrow h = 25$$

Substituting again,

$$25n = 2500 - 1500 = 1000 \Rightarrow n = 40$$

Name	Particular	Day 1	Day 2	Total
	Number of TRICCEK sold	40	60	100
Tohri	Number of households met	10	40	50
	Success Rate	4	1.5	
	Number of TRICCEK sold	100	0	100
Hokli	Number of households met	49	1	50
	Success Rate	2.04	0	
	Number of TRICCEK sold	50	50	100
Lahur	Number of households met	25	25	50
	Success Rate	2	2	

Now we can answer the questions

The number of TRICCEK items sold by Tohri on the first day = 40

QNo:- 42 ,Correct Answer:- B

Explanation:- Let the total number of households each met over the two days = $2h$

Total number of items sold by each over the two days = 100

Let the number of TRICCEK sold on day 1 by Tohri = n

\Rightarrow the number of TRICCEK sold on day 2 by Tohri = $100 - n$

The rest of the information can be gathered as follows

Name	Particular	Day 1	Day 2	Total
	Number of TRICCEK sold	n	$100 - n$	100
Tohri	Number of households met	$h - 15$	$h + 15$	$2h$
	Success Rate	$n/(h - 15)$	$(100 - n)/(h + 15)$	
	Number of TRICCEK sold	100	0	100
Hokli	Number of households met	$2h - 1$	1	$2h$
	Success Rate	$100/(2h - 1)$	0	



	Number of TRICCEK sold	50	50	100
Lahur	Number of households met	h	h	2h
	Success Rate	50/h	50/h	

Tohri's success rate was twice that of Lahur's on the first day,

$$\Rightarrow n/(h - 15) = 2 \times (50/h)$$

Solving, $nh = 100h - 1500$

Also, Tohri's success rate was 75% of Lahur's on the second day,

$$\Rightarrow (100 - n)/(h + 15) = (75/100) \times (50/h)$$

Solving, $200h - 2nh = 75h + 1125$

Substituting the value of nh ,

$$\Rightarrow 200h - 2(100h - 1500) = 75h + 1125$$

$$\Rightarrow 3000 = 75h + 1125 \Rightarrow h = 25$$

Substituting again,

$$25n = 2500 - 1500 = 1000 \Rightarrow n = 40$$

Name	Particular	Day 1	Day 2	Total
	Number of TRICCEK sold	40	60	100
Tohri	Number of households met	10	40	50
	Success Rate	4	1.5	
	Number of TRICCEK sold	100	0	100
Hokli	Number of households met	49	1	50
	Success Rate	2.04	0	
	Number of TRICCEK sold	50	50	100
Lahur	Number of households met	25	25	50
	Success Rate	2	2	

Now we can answer the questions

The number of households Lahur met on the second day = 25

Hence, between 21 and 29

QNo:- 43 ,Correct Answer:- B

Explanation:- Let the total number of households each met over the two days = $2h$

Total number of items sold by each over the two days = 100

Let the number of TRICCEK sold on day 1 by Tohri = n

\Rightarrow the number of TRICCEK sold on day 2 by Tohri = $100 - n$

The rest of the information can be gathered as follows

Name	Particular	Day 1	Day 2	Total
	Number of TRICCEK sold	n	100 - n	100
Tohri	Number of households met	h - 15	h + 15	2h
	Success Rate	$n/(h - 15)$	$(100 - n)/(h + 15)$	
	Number of TRICCEK sold	100	0	100
Hokli	Number of households met	2h - 1	1	2h
	Success Rate	$100/(2h - 1)$	0	
	Number of TRICCEK sold	50	50	100
Lahur	Number of households met	h	h	2h
	Success Rate	50/h	50/h	

Tohri's success rate was twice that of Lahur's on the first day,



$$\Rightarrow n/(h - 15) = 2 \times (50/h)$$

$$\text{Solving, } nh = 100h - 1500$$

Also, Tohri's success rate was 75% of Lahur's on the second day,

$$\Rightarrow (100 - n)/h + 15 = (75/100) \times (50/h)$$

$$\text{Solving, } 200h - 2nh = 75h + 1125$$

Substituting the value of nh ,

$$\Rightarrow 200h - 2(100h - 1500) = 75h + 1125$$

$$\Rightarrow 3000 = 75h + 1125 \Rightarrow h = 25$$

Substituting again,

$$25n = 2500 - 1500 = 1000 \Rightarrow n = 40$$

Name	Particular	Day 1	Day 2	Total
	Number of TRICCEK sold	40	60	100
Tohri	Number of households met	10	40	50
	Success Rate	4	1.5	
	Number of TRICCEK sold	100	0	100
Hokli	Number of households met	49	1	50
	Success Rate	2.04	0	
	Number of TRICCEK sold	50	50	100
Lahur	Number of households met	25	25	50
	Success Rate	2	2	

Now we can answer the questions

The number of households Tohri met on the first day = 10

Hence, 10 or less

QNo:- 44 ,Correct Answer:- A

Explanation:- Let the total number of households each met over the two days = $2h$

Total number of items sold by each over the two days = 100

Let the number of TRICCEK sold on day 1 by Tohri = n

\Rightarrow the number of TRICCEK sold on day 2 by Tohri = $100 - n$

The rest of the information can be gathered as follows

Name	Particular	Day 1	Day 2	Total
	Number of TRICCEK sold	n	$100 - n$	100
Tohri	Number of households met	$h - 15$	$h + 15$	$2h$
	Success Rate	$n/(h - 15)$	$(100 - n)/(h + 15)$	
	Number of TRICCEK sold	100	0	100
Hokli	Number of households met	$2h - 1$	1	$2h$
	Success Rate	$100/(2h - 1)$	0	
	Number of TRICCEK sold	50	50	100
Lahur	Number of households met	h	h	$2h$
	Success Rate	$50/h$	$50/h$	

Tohri's success rate was twice that of Lahur's on the first day,

$$\Rightarrow n/(h - 15) = 2 \times (50/h)$$

$$\text{Solving, } nh = 100h - 1500$$

Also, Tohri's success rate was 75% of Lahur's on the second day,

$$\Rightarrow (100 - n)/h + 15 = (75/100) \times (50/h)$$

$$\text{Solving, } 200h - 2nh = 75h + 1125$$

Substituting the value of nh ,



=> 200h - 2(100h - 1500) = 75h + 1125

=> 3000 = 75h + 1125 => h = 25

Substituting again,

25n = 2500 - 1500 = 1000 => n = 40

Name	Particular	Day 1	Day 2	Total
Tohri	Number of TRICCEK sold	40	60	100
	Number of households met	10	40	50
	Success Rate	4	1.5	
Hokli	Number of TRICCEK sold	100	0	100
	Number of households met	49	1	50
	Success Rate	2.04	0	
Lahur	Number of TRICCEK sold	50	50	100
	Number of households met	25	25	50
	Success Rate	2	2	

Now we can answer the questions

Going by options,

1. Among the three, Tohri had the highest success rate on the second day.

Lahur had the highest success rate on the second day

Hence, statement 1 is false.

2. Tohri had a higher success rate on the first day compared to the second day.

Statement 2 is true

3. Among the three, Tohri had the highest success rate on the first day.

Statement 3 is true

4. Among the three, Lahur had the lowest success rate on the first day.

Statement 4 is true

Section : Quantitative Ability

QNo:- 45 ,Correct Answer:- C

Explanation:- Since, f(x) ≥ 0 and f(2) = 0

=> Both the roots of the quadratic polynomial are equal to 2

Let the quadratic polynomial be f(x) = ax² + bx + c

Sum of roots = 2 + 2 = -b/a => b = -4a

Product of roots = 2 × 2 = c/a => c = 4a

Also, f(4) = 6 => 16a + 4b + c = 6

Substituting and solving,

16a + 4(-4a) + 4a = 6

=> a = 1.5, b = -6 and c = 6

f(-2) = 1.5(-2)² + (-6)(-2) + 6 = 24

QNo:- 46 ,Correct Answer:- 4

Explanation:- (x² - 10)x² - 3x - 10 = 1

Case 1	Case 2	Case 3
(x ² - 10) ⁰ = 1	(1)x ² - 3x - 10 = 1	(-1)even = 1
=> x ² - 3x - 10 = 0	=> x ² - 10 = 1	=> x ² - 10 = -1
=> (x + 2)(x - 5) = 0	=> x = ±√11	=> x ² = 9
=> x = -2 or 5	No integral solutions	=> x = -3 or 3
Two integral solutions		



(for both -3 and 3, $x^2 - 3x - 10 = \text{even}$)
Two integral solutions

Total integral solutions = 4

QNo:- 47 ,Correct Answer:- D

Explanation:- Total income of Manu for 1st nine months = $4000 \times 9 = \text{Rs } 36000$

Total expenditure for 1st nine months = $3500 \times 9 = \text{Rs } 31500$

Total savings for the 1st nine months = $36000 - 31500 = \text{Rs } 4500$

Total annual saving = $550 \times 12 = \text{Rs } 6600$

Total saving for the last three months = $6600 - 4500 = \text{Rs } 2100$

Total expenditure for the last three months = $3700 \times 3 = \text{Rs } 11100$

Total income for the last three months = $2100 + 11100 = \text{Rs } 13200$

Income per month for the remaining 3 months = $13200/3 = \text{Rs } 4400$

QNo:- 48 ,Correct Answer:- 6

Explanation:- Time taken by Anu = $5t$, Tanu = $8t$ and Manu = $10t$ (where t is in hours)

Let job = $40t$ (LCM of $5t$, $8t$ and $10t$)

Efficiency of Anu, $A = 8$ units/hour

Efficiency of Tanu, $T = 5$ units/hour

Efficiency of Manu, $M = 4$ units/hour

$A + T + M = 40t/(4 \times 8)$

Solving, total job = $40t = 544$ units

Job done by Anu and Tanu in 6 days working 6 hrs 40 mins (= $20/3$ hrs)

= $(8 + 5) \times 6 \times 20/3 = 520$ units

Remaining job = $544 - 520 = 24$ units

Time taken by Manu to complete the remaining job = $24/4 = 6$ hours

QNo:- 49 ,Correct Answer:- B

Explanation:- Let the marks scored by Amit be A and by other candidates be B, C, D and E

Given, $A + B + C + D + E = 38 \times 5 = 190$

Exactly three of them scored above 32 and no two student scored same marks

Lowest marks scored by Amit, when rest scored the maximum

Let $B = 32, C = 48, D = 49$ and $E = 50$

=> Lowest marks scored by Amit = $190 - (32 + 48 + 49 + 50) = 11$

Highest marks scored by Amit = 31

such that $B = 32, C + D + E = 190 - (31 + 32) = 127$

Required difference = $31 - 11 = 20$

QNo:- 50 ,Correct Answer:- 24

Explanation:- Let the number of correct answered questions = x , wrong = y and unattempted = z

Given, $x + y + z = 75$

Also, $3x - y + z = 97$

Subtracting, $2x - 2y = 22$

=> $x - y = 11$

Also, $z > x + y$

=> $x + y$ (maximum) = 37 (such that $z = 38$)

=> $2x = 48$ (maximum)

=> $x = 24$ (maximum)



QNo:- 51 ,Correct Answer:- 10

Explanation:- Let the number of sides of A and B be a and 2a respectively
Given,

$$\frac{(a - 2) \times 180^\circ}{a} : \frac{(2a - 2) \times 180^\circ}{2a} = 3:4$$

$$\Rightarrow (a - 2)/(a - 1) = 3/4$$

$$\text{Solving, } 4a - 8 = 3a - 3$$

$$\Rightarrow a = 5$$

Hence, the number of sides of B = 2a = 10

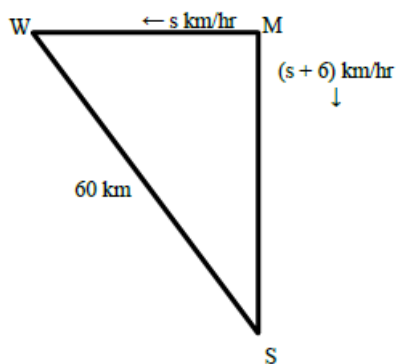
QNo:- 52 ,Correct Answer:- C

Explanation:- Let the volume of each container = 16x

Transferred	1 st container		2 nd container	
	Sugar Syrup	Milk	Sugar Syrup	Milk
Half filled	8x	0	0	8x
50% of 1 st to 2 nd	-4x	-0	+4x	+0
Left	4x	0	4x	8x
50% of 2 nd to 1 st	+2x	+4x	-2x	-4x
Left	6x	4x	2x	4x
50% of 1 st to 2 nd	-3x	-2x	+3x	+2x
Left	3x	2x	5x	6x

Required ratio = 5:6

QNo:- 53 ,Correct Answer:- B



Explanation:-

Let the meeting point is M.

Let the speed of the ship that goes West

$$= s \text{ km/hr}$$

\Rightarrow the speed of the ship that goes South

$$= (s + 6) \text{ km/hr}$$

In 2 hrs, distance covered by ship (West)

$$MW = 2s$$

And distance covered by ship (South)

$$MS = 2s + 12$$

Given, distance between them after 2 hrs

$$WS = 60 \text{ km}$$

Applying Pythagoras theorem,



$$MW^2 + MS^2 = WS^2$$

$$\Rightarrow (2s)^2 + (2s + 12)^2 = 60^2$$

$$\Rightarrow 4s^2 + 4s^2 + 144 + 48s = 3600$$

$$\Rightarrow 8s^2 + 48s - 3456 = 0$$

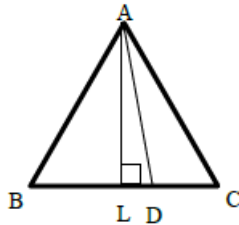
$$\Rightarrow s^2 + 6s - 432 = 0$$

$$\Rightarrow (s - 18)(s + 24) = 0$$

$$\Rightarrow s = 18 \text{ or } -24 \text{ (rejected)}$$

Hence, the speed of slower ship = 18 km/hr

QNo:- 54 ,Correct Answer:- A



Explanation:-

The side of equilateral triangle = 3 cm

Since, area triangle ADC = $\frac{1}{2}$ × area triangle ABD

D divides BC in the ratio 2:1

$$\Rightarrow BD = \frac{2}{3} \times 3 = 2 \text{ cm}$$

The height of equilateral triangle ABC,

$$AL = \frac{\sqrt{3}}{2} \times 3 = \frac{3\sqrt{3}}{2} \text{ cm}$$

Also, AL divides BC in the ratio 1:1

$$\Rightarrow BL = \frac{1}{2} \times 3 = \frac{3}{2} \text{ cm}$$

$$\Rightarrow LD = BD - BL = 2 - \frac{3}{2} = \frac{1}{2} \text{ cm}$$

In triangle ALD,

$$AD^2 = AL^2 + LD^2$$

$$AD^2 = \left(\frac{3\sqrt{3}}{2}\right)^2 + \left(\frac{1}{2}\right)^2$$

$$AD = \sqrt{7} \text{ cm}$$

QNo:- 55 ,Correct Answer:- C

Explanation:- Number of integers > 2000 are

$$4 \text{ digit numbers} = 4 \times 5 \times 4 \times 3 = 240$$

$$5 \text{ digit numbers} = 5 \times 5 \times 4 \times 3 \times 2 = 600$$

$$6 \text{ digit numbers} = 5 \times 5 \times 4 \times 3 \times 2 \times 1 = 600$$

$$\text{Total} = 240 + 600 + 600 = 1440$$

QNo:- 56 ,Correct Answer:- B

Explanation:- Let the third root of the cubic equation $f(x) = 5x^3 + cx^2 - 10x + 9 = 0$ is p

$$\text{Sum of roots} = r - r + p = -c/5 \Rightarrow p = -c/5$$

$$\text{Sum of roots taken two at a time} = r(-r) + rp + (-r)p = -10/5 = -2$$

$$\Rightarrow -r^2 = -2 \Rightarrow r = \pm\sqrt{2}$$

$$\text{Product of roots} = r(-r)p = -9/5 \Rightarrow p = 9/10$$

Substituting and solving,

$$9/10 = -c/5$$

$$\Rightarrow c = -9/2$$

QNo:- 57 ,Correct Answer:- A



Explanation:- Day 1, number of bacteria = 100

Day 2, $1/2 \times 100 = 50$ more bacteria produces, total = 150

Day 3, $1/3 \times 150 = 50$ more bacteria produces, total = 200

Day 4, $1/4 \times 200 = 50$ more bacteria produces, total = 250

And so on

This forms an AP with 1st term as 100 and common difference = 50

Let the required day = d^{th} day

Solving, $100 + (d - 1) 50 \geq 1000$

$\Rightarrow (d - 1) \geq 18$

$\Rightarrow d \geq 19$

Hence, on 19th day, the total number of bacteria will be more than or equal to 1000

QNo:- 58 ,Correct Answer:- B

Explanation:- Let the total number of registered voters = $300x$

\Rightarrow total number of votes casted = $240x$

Number of votes one candidate received = 30% of $240x = 72x$

Remaining votes = $240x - 72x = 168x$

Number of votes received by other three candidates

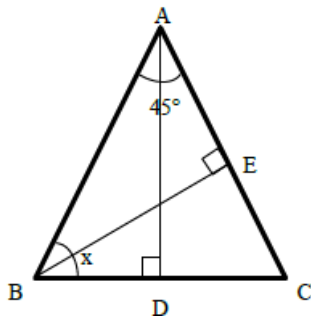
$1/6 \times 168x = 28x$, $2/6 \times 168x = 56x$ and $3/6 \times 168x = 84x$

Given, $84x - 72x = 2512$

$\Rightarrow 12x = 2512$

$\Rightarrow 300x = 62800$

QNo:- 59 ,Correct Answer:- D



Explanation:-

In triangle AEB,

Let $AE = BE = a$

$\Rightarrow AB = a\sqrt{2}$

In triangle ADB,

$\sin x = AD/AB$

$\Rightarrow AD = AB \sin x$

$= a\sqrt{2} \sin x$

Required ratio,

AD/BE

$= (a\sqrt{2} \sin x)/a$

$= \sqrt{2} \sin x$

QNo:- 60 ,Correct Answer:- 20

Explanation:- Let total investment by Mr. Pinto = $15P$

$1/5 \times 15P = 3P$ at 6% SI

$1/3 \times 15P = 5P$ at 10% SI



Remaining, $15P - (3P + 5P) = 7P$ at 1% SI

Let the required number of years = t

Total simple interest = $(3P \times 6/100 + 5P \times 10/100 + 7P \times 1/100) \times t \geq 15P$

Solving, $75P/100 \times t \geq 15P$

$\Rightarrow t \geq 20$

Hence, the minimum number of years = 20 years

QNo:- 61 ,Correct Answer:- B

Explanation:- We know, $(7!)! = 5040!$ and $(8!)! = 40320!$

Hence, the maximum value that can divide $15000!$ is $(7!)!$

QNo:- 62 ,Correct Answer:- 14

Explanation:- Given, $a_1 + a_2 + a_3 + \dots + a_N = 300N$

Also, $6a_1 + a_2 + a_3 + \dots + a_N = 400N$

Subtracting, $5a_1 = 100N$

$\Rightarrow a_1 = 20N$

Now, starting from $N = 1$

$\Rightarrow a_1 = 20$ is the only value, the average required is 300, not possible

$N = 2 \Rightarrow a_1 = 40$ and $a_2 = 560$, such that average = 300, possible

$N = 3, 4, \dots, 15$

At $N = 15$, $a_1 = 300 = a_2 = a_3 = \dots = a_{15}$, average = 300, possible

At $N = 16$, $a_1 = 320$ and since the sequence is non-decreasing,

$a_2, a_3, a_4, \dots \geq 320$ and cannot have average = 300, not possible

Hence, possible values of $a_1 = 14$ (for $N = 2$ to 15 , inclusive)

QNo:- 63 ,Correct Answer:- C

Explanation:- $A_n = 3 + 7 + 11 + 15 + \dots$

$A_n = n/2 [2 \times 3 + (n-1) 4]$

$A_n = n/2 (6 + 4n - 4)$

$A_n = 2n^2 + n$

$$\frac{1}{25} \sum_1^{25} A_n = \frac{1}{25} \sum_1^{25} (2n^2 + n) = \frac{1}{25} \left(2 \sum_1^{25} n^2 + \sum_1^{25} n \right)$$

$$= \frac{1}{25} \left[\frac{2 \times 25 \times 26 \times 51}{6} + \frac{25 \times 26}{2} \right]$$

$$= 442 + 13$$

$$= 455$$

QNo:- 64 ,Correct Answer:- 12

Explanation:- Given, $f(x^2 - x) = 5$

Putting $x = 1$, $f(0) = 5$

$f(1) + f(0) - 1 = 0 \Rightarrow f(1) = -4$

$f(2) + f(1) - 1 = 0 \Rightarrow f(2) = 5$

$f(3) + f(2) - 1 = 0 \Rightarrow f(3) = -4$

$f(4) + f(3) - 1 = 0 \Rightarrow f(4) = 5$

$f(5) + f(4) - 1 = 0 \Rightarrow f(5) = -4$

And so on



$f(\text{odd value}) = -4$ and $f(\text{even value}) = 5$

Also, $g(x) = x^2$

$f(g(5)) + g(f(5)) = f(25) + g(-4)$

$= -4 + 16 = 12$

QNo:- 65 ,Correct Answer:- 47

Explanation:- $(4 - \log_2 n)/(3 - \log_4 n) < 0$

$(4 - \log_2 n)(3 - \log_4 n)/(3 - \log_4 n)^2 < 0$

$(4 - \log_2 n)(3 - \log_4 n) < 0$

$\Rightarrow 4 - \log_2 n < 0$ and $3 - \log_4 n > 0$

$\Rightarrow 4 < \log_2 n$ and $3 > \log_4 n$

$\Rightarrow n > 2^4 = 16$ and $n < 4^3 = 64$

$\Rightarrow 16 < n < 64$

Hence, the number of integral solutions for $n = 47$

QNo:- 66 ,Correct Answer:- B

Explanation:- Given, $a + 2b = 6$ where a and b are non-negative real numbers

The maximum value of $a + b = 6$ when $a = 6$ and $b = 0$

And the minimum value of $a + b = 3$ when $a = 0$ and $b = 3$

Hence, the required average = $(6 + 3)/2 = 4.5$

**Directions of Test**

Test Name	Actual CAT 2022 Slot III	Total Questions	66	Total Time	120 Mins
Section Name	No. of Questions	Time limit	Marks per Question	Negative Marking	
Verbal Ability	24	0:40(h:m)	3	1/3	
DI & Reasoning	20	0:40(h:m)	3	1/3	
Quantitative Ability	22	0:40(h:m)	3	1/3	

Section : Verbal Ability

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

Question No. : 1

Sociologists working in the Chicago School tradition have focused on how rapid or dramatic social change causes increases in crime. Just as Durkheim, Marx, Toennies, and other European sociologists thought that the rapid changes produced by industrialization and urbanization produced crime and disorder, so too did the Chicago School theorists. The location of the University of Chicago provided an excellent opportunity for Park, Burgess, and McKenzie to study the social ecology of the city. Shaw and McKay found . . . that areas of the city characterized by high levels of social disorganization had higher rates of crime and delinquency.

In the 1920s and 1930s Chicago, like many American cities, experienced considerable immigration. Rapid population growth is a disorganizing influence, but growth resulting from in-migration of very different people is particularly disruptive. Chicago's in-migrants were both native-born whites and blacks from rural areas and small towns, and foreign immigrants. The heavy industry of cities like Chicago, Detroit, and Pittsburgh drew those seeking opportunities and new lives. Farmers and villagers from America's hinterland, like their European cousins of whom Durkheim wrote, moved in large numbers into cities. At the start of the twentieth century, Americans were predominately a rural population, but by the century's mid-point most lived in urban areas. The social lives of these migrants, as well as those already living in the cities they moved to, were disrupted by the differences between urban and rural life.

According to social disorganization theory, until the social ecology of the "new place" can adapt, this rapid change is a criminogenic influence. But most rural migrants, and even many of the foreign immigrants to the city, looked like and eventually spoke the same language as the natives of the cities into which they moved. These similarities allowed for more rapid social integration for these migrants than was the case for African Americans and most foreign immigrants.

In these same decades America experienced what has been called "the great migration": the massive movement of African Americans out of the rural South and into northern (and some southern) cities. The scale of this migration is one of the most dramatic in human history.

These migrants, unlike their white counterparts, were not integrated into the cities they now called home. In fact, most American cities at the end of the twentieth century were characterized by high levels of racial residential segregation... Failure to integrate these migrants, coupled with other forces of social disorganization such as crowding, poverty, and illness, caused crime rates to climb in the cities, particularly in the segregated wards and neighborhoods where the migrants were forced to live.

Foreign immigrants during this period did not look as dramatically different from the rest of the population as blacks did, but the migrants from eastern and southern Europe who came to American cities did not speak English, and were frequently Catholic, while the native born were mostly Protestant. The combination of rapid population growth with the diversity of those moving into the cities created what the Chicago School sociologists called social disorganization.

Which one of the following is not a valid inference from the passage?

- A) The differences between urban and rural lifestyles were crucial factors in the disruption experienced by migrants to American cities.
- B) The failure to integrate in-migrants, along with social problems like poverty, was a significant reason for the rise in crime in American cities.



- C) According to social disorganisation theory, fast-paced social change provides fertile ground for the rapid growth of crime.
D) According to social disorganisation theory, the social integration of African American migrants into Chicago was slower because they were less organised.

Question No. : 2

Which one of the following sets of words/phrases best encapsulates the issues discussed in the passage?

- A) Chicago School; Native-born Whites; European immigrants; Poverty B) Durkheim; Marx; Toennies; Shaw
C) Rapid population growth; Heavy industry; Segregation; Crime D) Chicago School; Social organisation; Migration; Crime

Question No. : 3

The author notes that, "At the start of the twentieth century, Americans were predominately a rural population, but by the century's mid-point most lived in urban areas." Which one of the following statements, if true, does not contradict this statement?

- A) Demographic transition in America in the twentieth century is strongly marked by an out-migration from rural areas.
B) Economists have found that throughout the twentieth century, the size of the labour force in America has always been largest in rural areas.
C) A population census conducted in 1952 showed that more Americans lived in rural areas than in urban ones.
D) The estimation of per capita income in America in the mid-twentieth century primarily required data from rural areas.

Question No. : 4

A fundamental conclusion by the author is that:

- A) the best circumstances for crime to flourish are when there are severe racial disparities.
B) to prevent crime, it is important to maintain social order through maintaining social segregation.
C) according to European sociologists, crime in America is mainly in Chicago.
D) rapid population growth and demographic diversity give rise to social disorganisation that can feed the growth of crime

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

Question No. : 5

As software improves, the people using it become less likely to sharpen their own know-how. Applications that offer lots of prompts and tips are often to blame; simpler, less solicitous programs push people harder to think, act and learn.

Ten years ago, information scientists at Utrecht University in the Netherlands had a group of people carry out complicated analytical and planning tasks using either rudimentary software that provided no assistance or sophisticated software that offered a great deal of aid. The researchers found that the people using the simple software developed better strategies, made fewer mistakes and developed a deeper aptitude for the work. The people using the more advanced software, meanwhile, would often "aimlessly click around" when confronted with a tricky problem. The supposedly helpful software actually short-circuited their thinking and learning.

[According to] philosopher Hubert Dreyfus..... our skills get sharper only through practice, when we use them regularly to overcome different sorts of difficult challenges. The goal of modern software, by contrast, is to ease our way through such challenges. Arduous, painstaking work is exactly what programmers are most eager to automate—after all, that is where the immediate efficiency gains tend to lie. In other words, a fundamental tension ripples between the interests of the people doing the automation and the interests of the people doing the work.

Nevertheless, automation's scope continues to widen. With the rise of electronic health records, physicians increasingly rely on software templates to guide them through patient exams. The programs incorporate valuable checklists and alerts, but they also make medicine more routinized and formulaic—and distance doctors from their patients..... Harvard Medical School professor Beth Lown, in a 2012 journal article.....warned that when doctors become "screen-driven," following a computer's prompts rather than "the patient's narrative thread," their thinking can become constricted. In the worst cases, they may miss important diagnostic signals. . . .

In a recent paper published in the journal *Diagnosis*, three medical researchers examined the misdiagnosis of Thomas Eric Duncan, the first person to die of Ebola in the U.S., at Texas Health Presbyterian Hospital Dallas. They argue that the digital templates used by the hospital's clinicians to record patient information probably helped to induce a kind of tunnel vision. "These highly constrained tools," the researchers write, "are optimized for data capture but at the expense of sacrificing their utility for appropriate triage and diagnosis, leading users to miss the forest for the trees." Medical software, they write, is no



"replacement for basic history-taking, examination skills, and critical thinking." . . .

There is an alternative. In "human-centered automation," the talents of people take precedence..... In this model, software plays an essential but secondary role. It takes over routine functions that a human operator has already mastered, issues alerts when unexpected situations arise, provides fresh information that expands the operator's perspective and counters the biases that often distort human thinking. The technology becomes the expert's partner, not the expert's replacement.

In the Ebola misdiagnosis case, we can infer that doctors probably missed the forest for the trees because:

- A) they were led by the data processed by digital templates. B) the digital templates forced them to acquire tunnel vision.
- C) the data collected were not sufficient for appropriate triage.
- D) they used the wrong type of digital templates for the case.

Question No. : 6

It can be inferred that in the Utrecht University experiment, one group of people was "aimlessly clicking around" because:

- A) they wanted to avoid making mistakes. B) they did not have the skill-set to address complicated tasks.
- C) they were hoping that the software would help carry out the tasks.
- D) the other group was carrying out the tasks more efficiently.

Question No. : 7

From the passage, we can infer that the author is apprehensive about the use of sophisticated automation for all of the following reasons EXCEPT that:

- A) it could mislead people. B) it stunts the development of its users. C) it stops users from exercising their minds.
- D) computers could replace humans.

Question No. : 8

In the context of the passage, all of the following can be considered examples of human-centered automation EXCEPT:

- A) a smart-home system that changes the temperature as instructed by the resident.
- B) software that auto-completes text when the user writes an email.
- C) medical software that provides optional feedback on the doctor's analysis of the medical situation.
- D) software that offers interpretations when requested by the human operator.

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

Question No. : 9

Nature has all along yielded her flesh to humans. First, we took nature's materials as food, fibers, and shelter. Then we learned to extract raw materials from her biosphere to create our own new synthetic materials. Now Bios is yielding us her mind—we are taking her logic.

Clockwork logic—the logic of the machines—will only build simple contraptions. Truly complex systems such as a cell, a meadow, an economy, or a brain (natural or artificial) require a rigorous nontechnological logic. We now see that no logic except bio-logic can assemble a thinking device, or even a workable system of any magnitude.

It is an astounding discovery that one can extract the logic of Bios out of biology and have something useful. Although many philosophers in the past have suspected one could abstract the laws of life and apply them elsewhere, it wasn't until the complexity of computers and human-made systems became as complicated as living things, that it was possible to prove this. It's eerie how much of life can be transferred. So far, some of the traits of the living that have successfully been transported to mechanical systems are: self-replication, self-governance, limited self-repair, mild evolution, and partial learning.

We have reason to believe yet more can be synthesized and made into something new. Yet at the same time that the logic of Bios is being imported into machines, the logic of Technos is being imported into life. The root of bioengineering is the desire to control the organic long enough to improve it. Domesticated plants and animals are examples of technos-logic applied to life. The wild aromatic root of the Queen Anne's lace weed has been fine-tuned over generations by selective herb gatherers until it has evolved into a sweet carrot of the garden; the udders of wild bovines have been selectively enlarged in a "unnatural" way to satisfy humans rather than calves. Milk cows and carrots, therefore, are human inventions as much as steam engines and gunpowder are. But milk cows and carrots are more indicative of the kind of inventions humans will make in the future: products that are grown rather than manufactured.



Genetic engineering is precisely what cattle breeders do when they select better strains of Holsteins, only bioengineers employ more precise and powerful control. While carrot and milk cow breeders had to rely on diffuse organic evolution, modern genetic engineers can use directed artificial evolution—purposeful design—which greatly accelerates improvements.

The overlap of the mechanical and the lifelike increases year by year. Part of this bionic convergence is a matter of words. The meanings of “mechanical” and “life” are both stretching until all complicated things can be perceived as machines, and all self-sustaining machines can be perceived as alive. Yet beyond semantics, two concrete trends are happening: (1) Human-made things are behaving more lifelike, and (2) Life is becoming more engineered. The apparent veil between the organic and the manufactured has crumpled to reveal that the two really are, and have always been, of one being.

The author claims that, “The apparent veil between the organic and the manufactured has crumpled to reveal that the two really are, and have always been, of one being.” Which one of the following statements best expresses the point being made by the author here?

- A) Scientific advances are making it increasingly difficult to distinguish between organic reality and manufactured reality.
- B) The crumpling of the organic veil between apparent and manufactured reality reveals them to have the same being.
- C) Organic reality has crumpled under the veil of manufacturing, rendering the apparent and the real as the same being.
- D) Apparent reality and organic reality are distinguished by the fact that the former is manufactured.

Question No. : 10

None of the following statements is implied by the arguments of the passage, EXCEPT:

- A) purposeful design represents the pinnacle of scientific expertise in the service of human betterment and civilisational progress.
- B) genetic engineers and bioengineers are the same insofar as they both seek to force evolution in an artificial way.
- C) the biological realm is as complex as the mechanical one; which is why the logic of Bios is being imported into machines.
- D) historically, philosophers have known that the laws of life can be abstracted and applied elsewhere.

Question No. : 11

Which one of the following sets of words/phrases best serves as keywords to the passage?

- A) Nature; Computers; Carrots; Milk cows; Genetic engineering
- B) Complex systems; Carrots; Milk cows; Convergence; Technos-logic
- C) Complex systems; Bio-logic; Bioengineering; Technos-logic; Convergence
- D) Nature; Bios; Technos; Self-repair; Holsteins

Question No. : 12

The author claims that, “Part of this bionic convergence is a matter of words”. Which one of the following statements best expresses the point being made by the author?

- A) “Mechanical” and “life” were earlier seen as opposite in meaning, but the difference between the two is increasingly blurred.
- B) “Mechanical” and “life” are words from different logical systems and are, therefore, fundamentally incompatible in meaning.
- C) “Bios” and “Technos” are both convergent forms of logic, but they generate meanings about the world that are mutually exclusive.
- D) A bionic convergence indicates the meeting ground of genetic engineering and artificial intelligence.

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

Question No. : 13

Interpretations of the Indian past . . . were inevitably influenced by colonial concerns and interests, and also by prevalent European ideas about history, civilization and the Orient. Orientalist scholars studied the languages and the texts with selected Indian scholars, but made little attempt to understand the world-view of those who were teaching them. The readings therefore are something of a disjuncture from the traditional ways of looking at the Indian past. . . .

Orientalism [which we can understand broadly as Western perceptions of the Orient] fuelled the fantasy and the freedom sought by European Romanticism, particularly in its opposition to the more disciplined Neo-Classicism. The cultures of Asia were seen as bringing a new Romantic paradigm. Another Renaissance was anticipated through an acquaintance with the Orient, and this, it was thought, would be different from the earlier Greek Renaissance. It was believed that this Oriental Renaissance would liberate European thought and literature from the increasing focus on discipline and rationality that had



followed from the earlier Enlightenment..... [The Romantic English poets, Wordsworth and Coleridge,] were apprehensive of the changes introduced by industrialization and turned to nature and to fantasies of the Orient.

However, this enthusiasm gradually changed, to conform with the emphasis later in the nineteenth century on the innate superiority of European civilization. Oriental civilizations were now seen as having once been great but currently in decline. The various phases of Orientalism tended to mould European understanding of the Indian past into a particular pattern..... There was an attempt to formulate Indian culture as uniform, such formulations being derived from texts that were given priority. The so-called 'discovery' of India was largely through selected literature in Sanskrit. This interpretation tended to emphasize non-historical aspects of Indian culture, for example the idea of an unchanging continuity of society and religion over 3,000 years; and it was believed that the Indian pattern of life was so concerned with metaphysics and the subtleties of religious belief that little attention was given to the more tangible aspects.

German Romanticism endorsed this image of India, and it became the mystic land for many Europeans, where even the most ordinary actions were imbued with a complex symbolism. This was the genesis of the idea of the spiritual east, and also, incidentally, the refuge of European intellectuals seeking to distance themselves from the changing patterns of their own societies. A dichotomy in values was maintained, Indian values being described as 'spiritual' and European values as 'materialistic', with little attempt to juxtapose these values with the reality of Indian society. This theme has been even more firmly endorsed by a section of Indian opinion during the last hundred years.

It was a consolation to the Indian intelligentsia for its perceived inability to counter the technical superiority of the west, a superiority viewed as having enabled Europe to colonize Asia and other parts of the world. At the height of anti-colonial nationalism it acted as a salve for having been made a colony of Britain.

In the context of the passage, all of the following statements are true EXCEPT:

- A) India's spiritualism served as a salve for European colonisers.
- B) Orientalists' understanding of Indian history was linked to colonial concerns.
- C) Indian texts influenced Orientalist scholars.
- D) Orientalist scholarship influenced Indians.

Question No. : 14

It can be inferred from the passage that the author is not likely to support the view that:

- A) India's culture has evolved over the centuries.
- B) the Orientalist view of Asia fired the imagination of some Western poets.
- C) Indian culture acknowledges the material aspects of life.
- D) India became a colony although it matched the technical knowledge of the West.

Question No. : 15

Which one of the following styles of research is most similar to the Orientalist scholars' method of understanding Indian history and culture?

- A) Reading 18th century accounts by travellers to India to see how they viewed Indian life and culture of the time.
- B) Studying artefacts excavated at a palace to understand the lifestyle of those who lived there.
- C) Reading about the life of early American settlers and later waves of migration to understand the evolution of American culture.
- D) Analysing Hollywood action movies that depict violence and sex to understand contemporary America.

Question No. : 16

It can be inferred from the passage that to gain a more accurate view of a nation's history and culture, scholars should do all of the following EXCEPT:

- A) examine the complex reality of that nation's society.
- B) develop an oppositional framework to grasp cultural differences.
- C) read widely in the country's literature.
- D) examine their own beliefs and biases.

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

Question No. : 17

1. If I wanted to sit indoors and read, or play Sonic the Hedgehog on a red-hot Sega Mega Drive, I would often be made to feel guilty about not going outside to "enjoy it while it lasts".



2. My mum, quite reasonably, wanted me and my sister out of the house, in the sun.
3. Tales of my mum's idyllic-sounding childhood in the Sussex countryside, where trees were climbed by 8 am and streams navigated by lunchtime, were passed down to us like folklore.
4. To an introverted kid, that felt like a threat – and the feeling has stayed with me.

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

Question No. : 18

To defend the sequence of alphabetisation may seem bizarre, so obvious is its application that it is hard to imagine a reference, catalogue or listing without it. But alphabetical order was not an immediate consequence of the alphabet itself. In the Middle Ages, deference for ecclesiastical tradition left scholars reluctant to categorise things according to the alphabet - to do so would be a rejection of the divine order. The rediscovery of the ancient Greek and Roman classics necessitated more efficient ways of ordering, searching and referencing texts. Government bureaucracy in the 16th and 17th centuries quickened the advance of alphabetical order, bringing with it pigeonholes, notebooks and card indexes.

- A) The alphabetic order took several centuries to gain common currency because of religious beliefs and a lack of appreciation of its efficacy in the ordering of things.
- B) Unlike the alphabet, once the efficacy of the alphabetic sequence became apparent to scholars and administrators, its use became widespread.
- C) The ban on the use by scholars of any form of categorisation - but the divinely ordained one - delayed the adoption of the alphabetic sequence by several centuries.
- D) While adoption of the written alphabet was easily accomplished, it took scholars several centuries to accept the alphabetic sequence as a useful tool in their work.

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

Question No. : 19

"It does seem to me that the job of comedy is to offend, or have the potential to offend, and it cannot be drained of that potential," Rowan Atkinson said of cancel culture. "Every joke has a victim. That's the definition of a joke. Someone or something or an idea is made to look ridiculous." The Netflix star continued, "I think you've got to be very, very careful about saying what you're allowed to make jokes about. You've always got to kick up? Really?" He added, "There are lots of extremely smug and self-satisfied people in what would be deemed lower down in society, who also deserve to be pulled up. In a proper free society, you should be allowed to make jokes about absolutely anything."

- A) Victims of jokes must not only be politicians and royalty, but also arrogant people from lower classes should be mentioned by comedians.
- B) Every joke needs a victim and one needs to include people from lower down the society and not just the upper class.
- C) Cancel culture does not understand the role and duty of comedians, which is to deride and mock everyone.
- D) All jokes target someone and one should be able to joke about anyone in the society, which is inconsistent with cancel culture.

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

Question No. : 20

Sentence: When people socially learn from each other, they often learn without understanding why what they're copying—the beliefs and behaviours and technologies and know-how—works.

Paragraph: ____ (1) _____. The dual-inheritance theorysays..... that inheritance is itself an evolutionary system. It has variation. What makes us a new kind of animal, and so different and successful as a species, is we rely heavily on social learning, to the point where socially acquired information is effectively a second line of inheritance, the first being our genes.... ____ (2) _____. People tend to home in on who seems to be the smartest or most successful person around, as well as what everybody seems to be doing—the majority of people have something worth learning. ____ (3) _____. When you repeat this process over time, you can get, around the world, cultural packages— beliefs or behaviours or technology or other solutions—that are adapted to the local conditions. People have different psychologies, effectively. ____ (4) _____.



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

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

Question No. : 21

Sentence: This has meant a lot of uncertainty around what a wide-scale return to office might look like in practice.

Paragraph: Bringing workers back to their desks has been a rocky road for employers and employees alike. The evolution of the pandemic has meant that best laid plans have often not materialised.____ (1) _____. The flow of workers back into offices has been more of a trickle than a steady stream. ____ (2) _____. Yet while plenty of companies are still working through their new policies, some employees across the globe are now back at their desks, whether on a full-time or hybrid basis.____ (3) _____. That means we're beginning to get some clarity on what return-to-office means – what's working, as well as what has yet to be settled.____ (4) _____.

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

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

Question No. : 22

1. Various industrial sectors including retail, transit systems, enterprises, educational institutions, event organizing, finance, travel etc. have now started leveraging these beacon solutions to track and communicate with their customers.
2. A beacon fixed on to a shop wall enables the retailer to assess the proximity of the customer, and come up with a much targeted or personalized communication like offers, discounts and combos on products in each shelf.
3. Smart phones or other mobile devices can capture the beacon signals, and distance can be estimated by measuring received signal strength.
4. Beacons are tiny and inexpensive, micro-location-based technology devices that can send radio frequency signals and notify nearby Bluetooth devices of their presence and transmit information.

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

Question No. : 23

1. The more we are able to accept that our achievements are largely out of our control, the easier it becomes to understand that our failures, and those of others, are too.
2. But the raft of recent books about the limits of merit is an important correction to the arrogance of contemporary entitlement and an opportunity to reassert the importance of luck, or grace, in our thinking.
3. Meritocracy as an organising principle is an inevitable function of a free society, as we are designed to see our achievements as worthy of reward.
4. And that in turn should increase our humility and the respect with which we treat our fellow citizens, helping ultimately to build a more compassionate society.

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

Question No. : 24

Tamsin Blanchard, curator of Fashion Open Studio, an initiative by a campaign group showcasing the work of ethical designers says, "We're all drawn to an exquisite piece of embroidery, a colourful textile or even a style of dressing that might have originated from another heritage. [But] this magpie mentality, where all of culture and history is up for grabs as 'inspiration', has accelerated since the proliferation of social media... Where once a fashion student might research the history and traditions of a particular item of clothing with care and respect, we now have a world where images are lifted from image libraries without a care for their cultural significance. It's easier than ever to steal a motif or a craft technique and transfer it on to a piece of clothing that is either mass produced or appears on a runway without credit or compensation to their original communities."



- A) Taking fashion ideas from any cultural group without their consent is a form of appropriation without giving due credit, compensation, and respect.
- B) Media has encouraged mass production; images are copied effortlessly without care or concern for the interests of ethnic communities.
- C) Cultural collaboration is the need of the hour. Beautiful design ideas of indigenous people need to be showcased and shared worldwide.
- D) Copying an embroidery design or pattern of textile from native communities who own them is tantamount to stealing and they need to be compensated.

Section : DI & Reasoning

DIRECTIONS for the question: Read the information given below and answer the question that follows.

Question No. : 25

All the first-year students in the computer science (CS) department in a university take both the courses (i) AI and (ii) ML. Students from other departments (non-CS students) can also take one of these two courses, but not both. Students who fail in a course get an F grade; others pass and are awarded A or B or C grades depending on their performance. The following are some additional facts about the number of students who took these two courses this year and the grades they obtained.

1. The numbers of non-CS students who took AI and ML were in the ratio 2 : 5.
2. The number of non-CS students who took either AI or ML was equal to the number of CS students.
3. The numbers of non-CS students who failed in the two courses were the same and their total is equal to the number of CS students who got a C grade in ML.
4. In both the courses, 50% of the students who passed got a B grade. But, while the numbers of students who got A and C grades were the same for AI, they were in the ratio 3 : 2 for ML.
5. No CS student failed in AI, while no non-CS student got an A grade in AI.
6. The numbers of CS students who got A, B and C grades respectively in AI were in the ratio 3 : 5 : 2, while in ML the ratio was 4 : 5 : 2.
7. The ratio of the total number of non-CS students failing in one of the two courses to the number of CS students failing in one of the two courses was 3 : 1.
8. 30 students failed in ML.

How many students took AI?

- A) 210 B) 90 C) 60 D) 270

Question No. : 26

How many CS students failed in ML? (in numerical value)

Question No. : 27

How many non-CS students got A grade in ML? (in numerical value)

Question No. : 28

How many students got A grade in AI?

- A) 84 B) 42 C) 63 D) 99

Question No. : 29

How many non-CS students got B grade in ML?

- A) 165 B) 25 C) 90 D) 75

DIRECTIONS for the question: Read the information given below and answer the question that follows.

Question No. : 30



In the following, a year corresponds to 1st of January of that year.

A study to determine the mortality rate for a disease began in 1980. The study chose 1000 males and 1000 females and followed them for forty years or until they died, whichever came first. The 1000 males chosen in 1980 consisted of 250 each of ages 10 to less than 20, 20 to less than 30, 30 to less than 40, and 40 to less than 50. The 1000 females chosen in 1980 also consisted of 250 each of ages 10 to less than 20, 20 to less than 30, 30 to less than 40, and 40 to less than 50.

The four figures below depict the age profile of those among the 2000 individuals who were still alive in 1990, 2000, 2010, and 2020. The blue bars in each figure represent the number of males in each age group at that point in time, while the pink bars represent the number of females in each age group at that point in time. The numbers next to the bars give the exact numbers being represented by the bars. For example, we know that 230 males among those tracked and who were alive in 1990 were aged between 20 and 30.



In 2000, what was the ratio of the number of dead males to dead females among those being tracked?

- A) 41 : 43
- B) 71 : 69
- C) 129 : 131
- D) 109 : 107

Question No. : 31

How many people who were being tracked and who were between 30 and 40 years of age in 1980 survived until 2010?

- A) 190
- B) 110
- C) 310
- D) 90

Question No. : 32

How many individuals who were being tracked and who were less than 30 years of age in 1980 survived until 2020?

- A) 230
- B) 580
- C) 470
- D) 240

Question No. : 33

How many of the males who were being tracked and who were between 20 and 30 years of age in 1980 died in the period 2000 to 2010? (in numerical value)

Question No. : 34

How many of the females who were being tracked and who were between 20 and 30 years of age in 1980 died between the ages of 50 and 60? (in numerical value)

DIRECTIONS for the question: Read the information given below and answer the question that follows.

Question No. : 35

There are only four neighbourhoods in a city - Levmosto, Tyhrmosto, Pesmosto and Kitmosto. During the onset of a pandemic, the number of new cases of a disease in each of these neighbourhoods was recorded over a period of five days. On each day, the



number of new cases recorded in any of the neighbourhoods was either 0, 1, 2 or 3.

The following facts are also known:

1. There was at least one new case in every neighbourhood on Day 1.
2. On each of the five days, there were more new cases in Kitmisto than in Pesmisto.
3. The number of new cases in the city in a day kept increasing during the five-day period. The number of new cases on Day 3 was exactly one more than that on Day 2.
4. The maximum number of new cases in a day in Pesmisto was 2, and this happened only once during the five-day period.
5. Kitmisto is the only place to have 3 new cases on Day 2.
6. The total numbers of new cases in Levpisto, Tyhrmisto, Pesmisto and Kitmisto over the five-day period were 12, 12, 5 and 14 respectively.

What BEST can be concluded about the total number of new cases in the city on Day 2?

- A) Exactly 7 B) Either 6 or 7 C) Either 7 or 8 D) Exactly 8

Question No. : 36

What BEST can be concluded about the number of new cases in Levpisto on Day 3?

- A) Exactly 2 B) Exactly 3 C) Either 0 or 1 D) Either 2 or 3

Question No. : 37

On which day(s) did Pesmisto not have any new case?

- A) Only Day 3 B) Both Day 2 and Day 3 C) Only Day 2 D) Both Day 2 and Day 4

Question No. : 38

Which of the two statements below is/are necessarily false? Statement A: There were 2 new cases in Tyhrmisto on Day 3. Statement B: There were no new cases in Pesmisto on Day 2.

- A) Statement B only B) Both Statement A and Statement B C) Neither Statement A nor Statement B
D) Statement A only

Question No. : 39

On how many days did Levpisto and Tyhrmisto have the same number of new cases?

- A) 2 B) 5 C) 3 D) 4

DIRECTIONS for the question: Read the information given below and answer the question that follows.

Question No. : 40

Pulak, Qasim, Ritesh, and Suresh participated in a tournament comprising of eight rounds. In each round, they formed two pairs, with each of them being in exactly one pair. The only restriction in the pairing was that the pairs would change in successive rounds. For example, if Pulak formed a pair with Qasim in the first round, then he would have to form a pair with Ritesh or Suresh in the second round. He would be free to pair with Qasim again in the third round. In each round, each pair decided whether to play the game in that round or not. If they decided not to play, then no money was exchanged between them. If they decided to play, they had to bet either Rs.1 or Rs.2 in that round. For example, if they chose to bet Rs.2, then the player winning the game got Rs.2 from the one losing the game.

At the beginning of the tournament, the players had Rs.10 each. The following table shows partial information about the amounts that the players had at the end of each of the eight rounds. It shows every time a player had Rs.10 at the end of a round, as well as every time, at the end of a round, a player had either the minimum or the maximum amount that he would have had across the eight rounds. For example, Suresh had Rs.10 at the end of Rounds 1, 3, and 8 and not after any of the other rounds. The maximum amount that he had at the end of any round was Rs.13 (at the end of Round 5), and the minimum amount he had at the end of any round was Rs.8 (at the end of Round 2). At the end of all other rounds, he must have had either Rs.9, Rs.11, or Rs.12.

It was also known that Pulak and Qasim had the same amount of money with them at the end of Round 4.



	Pulak	Qasim	Ritesh	Suresh
Round 1		Rs.8	Rs.10	Rs.10
Round 2	Rs.13	Rs.10		Rs.8
Round 3				Rs.10
Round 4				
Round 5	Rs.10	Rs.10		Rs.13
Round 6				
Round 7		Rs.12	Rs.4	
Round 8	Rs.13			Rs.10

What BEST can be said about the amount of money that Ritesh had with him at the end of Round 8?

- A) Rs. 5 or Rs. 6 B) Rs. 4 or Rs. 5 C) Exactly Rs. 6 D) Exactly Rs. 5

Question No. : 41

What BEST can be said about the amount of money that Pulak had with him at the end of Round 6?

- A) Rs. 11 or Rs. 12 B) Rs. 12 or Rs. 13 C) Exactly Rs. 11 D) Exactly Rs. 12

Question No. : 42

How much money (in Rs.) did Ritesh have at the end of Round 4? (in numerical value)

Question No. : 43

How many games were played with a bet of Rs. 2? (in numerical value)

Question No. : 44

Which of the following pairings was made in Round 5? (in numerical value)

Section : Quantitative Ability

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 45

A group of N people worked on a project. They finished 35% of the project by working 7 hours a day for 10 days. Thereafter, 10 people left the group and the remaining people finished the rest of the project in 14 days by working 10 hours a day. Then the value of N is

- A) 140 B) 36 C) 23 D) 150

Question No. : 46

A donation box can receive only cheques of Rs.100, Rs.250, and Rs.500. On one good day, the donation box was found to contain exactly 100 cheques amounting to a total sum of Rs.15250. Then, the maximum possible number of cheques of Rs.500 that the donation box may have contained, is (in numerical value)

Question No. : 47

The arithmetic mean of all the distinct numbers that can be obtained by rearranging the digits in 1421, including itself, is

- A) 2592 B) 2442 C) 3333 D) 2222

Question No. : 48



Moody takes 30 seconds to finish riding an escalator if he walks on it at his normal speed in the same direction. He takes 20 seconds to finish riding the escalator if he walks at twice his normal speed in the same direction. If Moody decides to stand still on the escalator, then the time, in seconds, needed to finish riding the escalator is (in numerical value)

Question No. : 49

The lengths of all four sides of a quadrilateral are integer valued. If three of its sides are of length 1 cm, 2 cm and 4 cm, then the total number of possible lengths of the fourth side is

- A) 4 B) 5 C) 6 D) 3

Question No. : 50

The minimum possible value of $\frac{x^2 - 6x + 10}{3 - x}$, for $x < 3$, is

- A) $-\frac{1}{2}$ B) 2 C) -2 D) $\frac{1}{2}$

Question No. : 51

Suppose the medians BD and CE of a triangle ABC intersect at a point O. If area of triangle ABC is 108 sq. cm., then, the area of the triangle EOD, in sq. cm., is (in numerical value)

Question No. : 52

Bob can finish a job in 40 days, if he works alone. Alex is twice as fast as Bob and thrice as fast as Cole in the same job. Suppose Alex and Bob work together on the first day, Bob and Cole work together on the second day, Cole and Alex work together on the third day, and then, they continue the work by repeating this three- day roster, with Alex and Bob working together on the fourth day, and so on. Then, the total number of days Alex would have worked when the job gets finished, is (in numerical value)

Question No. : 53

Let r be a real number and $f(x) = \begin{cases} 2x - r & \text{if } x \geq r \\ r & \text{if } x < r \end{cases}$

Then, the equation $f(x) = f(f(x))$ holds for all real values of x where.

- A) $x \leq r$ B) $x \geq r$ C) $x \neq r$ D) $x > r$

Question No. : 54

In a triangle ABC, $AB = AC = 8$ cm. A circle drawn with BC as diameter passes through A. Another circle drawn with center at A passes through B and C. Then the area, in sq. cm, of the overlapping region between the two circles is

- A) $32(\pi - 1)$ B) 32π C) $16(\pi - 1)$ D) 16π

Question No. : 55

A glass contains 500 cc of milk and a cup contains 500 cc of water. From the glass, 150 cc of milk is transferred to the cup and mixed thoroughly. Next, 150 cc of this mixture is transferred from the cup to the glass. Now, the amount of water in the glass and the amount of milk in the cup are in the ratio

- A) 10 : 3 B) 1 : 1 C) 3 : 10 D) 10 : 13

Question No. : 56

If $\left(\sqrt{\frac{7}{5}}\right)^{3x-y} = \frac{875}{2401}$ and $\left(\frac{4a}{b}\right)^{6x-y} = \left(\frac{2a}{b}\right)^{y-6x}$,

for all non-zero real values of a and b , then the value of $x + y$ is (in numerical value)

**Question No. : 57**

In an examination, the average marks of students in sections A and B are 32 and 60, respectively. The number of students in section A is 10 less than that in section B. If the average marks of all the students across both the sections combined is an integer, then the difference between the maximum and minimum possible number of students in section A is (in numerical value)

Question No. : 58

Suppose k is any integer such that the equation $2x^2 + kx + 5 = 0$ has no real roots and the equation $x^2 + (k - 5)x + 1 = 0$ has two distinct real roots for x . Then, the number of possible values of k is

- A) 8 B) 9 C) 7 D) 13

Question No. : 59

Two ships are approaching a port along straight routes at constant speeds. Initially, the two ships and the port formed an equilateral triangle with sides of length 24 km. When the slower ship travelled 8 km, the triangle formed by the new positions of the two ships and the port became right-angled. When the faster ship reaches the port, the distance, in km, between the other ship and the port will be

- A) 12 B) 4 C) 6 D) 8

Question No. : 60

A school has less than 5000 students and if the students are divided equally into teams of either 9 or 10 or 12 or 25 each, exactly 4 are always left out. However, if they are divided into teams of 11 each, no one is left out. The maximum number of teams of 12 each that can be formed out of the students in the school is (in numerical value)

Question No. : 61

Two cars travel from different locations at constant speeds. To meet each other after starting at the same time, they take 1.5 hours if they travel towards each other, but 10.5 hours if they travel in the same direction. If the speed of the slower car is 60 km/hr, then the distance traveled, in km, by the slower car when it meets the other car while traveling towards each other, is

- A) 90 B) 100 C) 150 D) 120

Question No. : 62

Consider six distinct natural numbers such that the average of the two smallest numbers is 14, and the average of the two largest numbers is 28. Then, the maximum possible value of the average of these six numbers is

- A) 22.5 B) 24 C) 23 D) 23.5

Question No. : 63

If $C = \frac{16x}{y} + \frac{49y}{x}$ for some non-zero real numbers x and y , then c cannot take the value

- A) -70 B) 60 C) -50 D) -60

Question No. : 64

The average of all 3-digit terms in the arithmetic progression 38, 55, 72, ..., is (in numerical value)

Question No. : 65

If $(3 + 2\sqrt{2})$ is a root of the equation $ax^2 + bx + c = 0$, and $(4 + 2\sqrt{3})$ is a root of the equation $ay^2 + my + n = 0$, where a, b, c, m and n are integers, then the value of $\left(\frac{b}{m} + \frac{c-2b}{n}\right)$ is

- A) 1 B) 3 C) 0 D) 4

**Question No. : 66**

Nitu has an initial capital of Rs. 20,000. Out of this, she invests Rs. 8,000 at 5.5% in bank A, Rs. 5,000 at 5.6% in bank B and the remaining amount at $x\%$ in bank C, each rate being simple interest per annum. Her combined annual interest income from these investments is equal to 5% of the initial capital. If she had invested her entire initial capital in bank C alone, then her annual interest income, in rupees, would have been

- A) 800 B) 700 C) 1000 D) 900
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Directions of Test

Test Name	Actual CAT 2022 Slot III	Total Questions	66	Total Time	120 Mins
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Section Name	No. of Questions	Time limit	Marks per Question	Negative Marking
Verbal Ability	24	0:40(h:m)	3	1/3
DI & Reasoning	20	0:40(h:m)	3	1/3
Quantitative Ability	22	0:40(h:m)	3	1/3

Section : Verbal Ability

QNo:- 1 ,Correct Answer:- D

Explanation:- The answer can be drawn from lines "these similarities allowed for **more rapid**.....African American and most foreign immigrants." which clearly contrasts the idea taken from the passage. Therefore option 4 is right answer.

QNo:- 2 ,Correct Answer:- D

Explanation:- option 4 is correct as it has all the important words/phrases.
option 1 misses **Social Organisation**
option 2 misses **Chicago School**
option 3 misses **Migration**

QNo:- 3 ,Correct Answer:- A

Explanation:- According to the question we need to select an option which supports the authors note i.e. **out - migration** from rural to urban therefore :
option 1 is correct
Rest of the options support the idea that there were more population in rural than in urban which contradicts the the out -migration

QNo:- 4 ,Correct Answer:- D

Explanation:- according to the passage '**social disorganisation**' is the key term predominantly present in all the paragraphs hence must be the part of fundamental conclusion by the author therefore:
option 4 is the correct option

QNo:- 5 ,Correct Answer:- A

Explanation:- option 1 is the most appropriately inferred from the passage.
option 2 is an extreme option because of '**.....forced them.....**' therefore cannot be an answer.
option 3 is taken from the passage's paragraph 5 hence can not be an inference.
option 4 there is no information shared related to '**type of digital template**' in the passage therefore cannot be an inference.

QNo:- 6 ,Correct Answer:- C

Explanation:- The inference can be drawn from the 2nd paragraph which highlights that the people using simple software developed better strategies and made fewer mistakes whereas people having access to the advanced software short-circuited their thinking and learning. Therefore option C is appropriate. Here 'aimlessly click around' means looking for solutions of tricky situation unsuccessfully.

QNo:- 7 ,Correct Answer:- D

Explanation:- We can infer all the given options except D as the author nowhere in the passage supported the view that computers or technology can be an appropriate replacement of humans.
the passage is an argumentative writing which is biased towards human skills there option A, B and c can be inferred easily.

QNo:- 8 ,Correct Answer:- B



Explanation:- Option B is correct answer because in this option, the automation is helping a software hence being a machine-centric. Option A,C and D are examples of human-centric because the automation involved helps the human directly.

QNo:- 9 ,Correct Answer:- A

Explanation:- Refer to the second line of last paragraph- '**The meanings of the "mechanical" perceived as alive.**' Author here most likely suggests that meanings of "mechanical" and "life" have stretched to such extent that any difference between the two is blurred now. Living things have been endowed with technological advancements. Similarly there has been a constant effort to sensitivize the machines to make it look more natural. Rest all other options are wrong or ambiguous interpretations of the given statement.

QNo:- 10 ,Correct Answer:- B

Explanation:- Throughout the passage the author tried to imply that there is almost negligible difference between genetic engineers and bioengineers; earlier ones have been trying to alter with genetic makeup for its advancement and the later ones have been trying to sensitivize machines with human qualities. So the answer that should follow is option 1. Rest of the options can't be deduced from the passage.

QNo:- 11 ,Correct Answer:- C

Explanation:- In the begining of the passage (second paragraph), author suggests how complex the nature around us is (**a cell, a meadow, an economy or human brain**). Then he moves on to propound that we borrowed a lot from nature, including her logic too. It is followed by explanation of bio-engineering and technological advancement and how they are converging into being one and the same. So the right answer is option 3. No other options include all of these aspects.

QNo:- 12 ,Correct Answer:- A

Explanation:- In the last paragraph, author concludes that the machines and the humans have more or less become the same. Not just have the scientists endowed the humans with technology, but they have tried to make the machines more realistic like humans. So the right option is 1. Rest all other options are strayed from the correct interpretation of the given statement.

QNo:- 13 ,Correct Answer:- A

Explanation:- Option A is correct answer because the author did not talk about European colonisers in particular but British in the last line of the passage. The meaning of '**salve**' is to promote healing. Option B, C and D can be traced in the passage easily.

QNo:- 14 ,Correct Answer:- D

Explanation:- Option D is correct because throughout the passage the author highlighted that India did not match the technical knowlege of the West. "**little attention was given to the more tangible aspects.**" Option A, B, and C goes well with the author's point of view.

QNo:- 15 ,Correct Answer:- D

Explanation:- Option D is correct because according to the passage, the style of research taken by the Orientalist scholars' involved a very superficial approach and did not bother to read any authentic literature, accounts or study any artifacts which is there in Options A, B, and C therefore making D as the correct option.

QNo:- 16 ,Correct Answer:- B

Explanation:- Option B is correct because developing an oppositional framework only introduces a segregation and division in the society, it doesn't help in gain a more accurate view of a nation's history and culture therefore scholars should not follow the same.

to attempt this question one must know the meaning of '**oppositional framework**' in context to the passage.

QNo:- 17 ,Correct Answer:- 2314

Explanation:- The opening sentence is 2 because it introduces the subject of the conversation, i.e. the narrator's mum, the narrator, and her sister. Further, 2-3 is a pair : "Me and my sister" mentioned in 2, are referred to as "us" in 3. Also, 3-1 is a pair as the trees and the streams mentioned in 3, have been referenced further in 1 with the phrase "going outside to "enjoy it while it lasts". The final sentence is 4 because the "threat" being referred to



in the given sentence, is mentioned in the previous sentence, "made to feel guilty about not going outside".
The right sequence is thus 2314.

QNo:- 18 ,Correct Answer:- A

Explanation:- The paragraph above says claims that alphabetical order was not an immediate consequence of the alphabet itself. The Middle Ages saw the rejection of alphabetical order due to religious beliefs, and it wasn't until the 16th and 17th centuries, when there was a need for more effective methods of organising and referencing texts as well as a need to deal with government bureaucracy, that alphabetical order began to gain popularity. The paragraph is effectively summarised and all the major points are covered in Option A.

QNo:- 19 ,Correct Answer:- D

Explanation:- In relation to cancel culture, Rowan Atkinson claims that every joke offends someone or something; therefore, jokes about anything should be permitted in a proper free society. Option D effectively sums up the paragraph.

QNo:- 20 ,Correct Answer:- B

Explanation:-

As we read the given text, it becomes clear that the missing sentence is neither a strong introduction nor a fitting end. Therefore, we can quickly eliminate choices 1 and 4.

In the case of option 3, the thoughts are already flowing easily. Most people may benefit from learning something new from those around them, and by repeatedly engaging in this learning process over time, you can develop cultural packages that are adapted to the needs of the local region.

Option 2 appears to fit the given sentence the most effectively. The phrase "socially acquired information" was used in the previous sentence. The above line shows how people in society learn from one another. The next phrase strengthens the notion that we can learn from those around us. Therefore, option 2 is the best one.

QNo:- 21 ,Correct Answer:- B

Explanation:- This question can be solved by eliminating the wrong choices. We can eliminate option 4 since the previous sentence states that clarity is emerging, therefore the omitted sentence—which talks about uncertainty prevailing—will be a misfit. Option 3 can also be disregarded because the preceding line states that some workers are now returning to their desks. Here, the given sentence seems illogical.

As "this has meant a lot of uncertainty" can fit in well with the sentence before either the options 1 and 2, so, both appear to be good alternatives. However, option 2 makes more sense given the subsequent line and the way the thoughts flow.

QNo:- 22 ,Correct Answer:- 4312

Explanation:- The most apt introductory sentence is 4 as it introduces the subject 'beacons'. 4-3 is a pair: 4 states that beacons send radio frequency signals; 3 further describes that smart phones and other mobile devices capture these signals. 1-2 is also a pair: 1 states that several industrial sectors have started using beacons for tracking and communicating with their customers; 2 further discusses how these beacons are employed to track this information.

4312 is hence the correct order.

QNo:- 23 ,Correct Answer:- 3214

Explanation:- The most suitable opening statement would be 3 as it is general and introduces the subject, i.e. Meritocracy. Further, 3-2 is a pair: in 3, it is mentioned that "we are designed to see our achievements as worthy of reward"; 2 discusses about "the raft of recent books" that sheds light on the limitations of this line of thought. Moreover, 2-1 is also a pair as 1 elaborates on the argument stated in 2 about the limits of merit and how realising these limits might make us more tolerant. A more compassionate society will be created as a result, as stated in 4 which comes after 1.

The right sequence is 3214.

QNo:- 24 ,Correct Answer:- A

Explanation:- The key point made here is that the spread of social media has made it simple to access fashion ideas from different cultures, making it easier than ever to unethically use these concepts or methods without giving credit to or compensation to the original communities. The focus of the paragraph is best expressed in Option A.

Section : DI & Reasoning

QNo:- 25 ,Correct Answer:- D

Explanation:- From directions 1, 2, 3, 5, 6; we can fill the table as below.



			A	B	C	F
CS	7k	AI	3y	5y	2y	0
			ML	4x	5x	2x
NON	2k	AI	0			x
CS	5k	ML				x

From 7th direction, Total number of non CS students failing in one of the two courses : CS student failing in one of the two courses = 3:1

2x:z = 3:1

Z = 2x/3

From 8th direction, z + x = 30

5x/3 = 80

X = 18

So, we can fill values in the table:

			A	B	C	F
CS	7k	AI	3y	5y	2y	0
			ML	72	90	36
NON	2k	AI	0			18
CS	5k	ML				18

Also, every student take both the courses in CS. So, number of students in AI = number of students in ML = 210

So, total number of students in CS = 210

K = 30

So, in Non CS, AI students = 60, in Non CS, ML students = 150

Also, 3y + 5y + 2y = 210 implies y = 21.

So, we can put values for the first row.

			A	B	C	F
CS	7k	AI	63	105	42	0
			ML	72	90	36
NON	2k	AI	0			18
CS	5k	ML				18

By taking 4th direction, we can have the final table as below:

			A	B	C	F
CS	7k	AI	63	105	42	0
			ML	72	90	36
NON	2k	AI	0	21	21	18
CS	5k	ML	27	75	30	18

210 + 60 = 270 ans.

QNo:- 26 ,Correct Answer:- 12

Explanation:- From directions 1, 2, 3, 5, 6; we can fill the table as below.

			A	B	C	F
CS	7k	AI	3y	5y	2y	0
			ML	4x	5x	2x
NON	2k	AI	0			x
CS	5k	ML				x

From 7th direction, Total number of non CS students failing in one of the two courses : CS student failing in one of the two courses = 3:1

2x:z = 3:1

Z = 2x/3

From 8th direction, z + x = 30

5x/3 = 80

X = 18

So, we can fill values in the table:

				A	B	C	F
CS	7k	AI	3y	5y	2y	0	
		ML	72	90	36	12	
NON	2k	AI	0				18
CS	5k	ML					18

Also, every student take both the courses in CS. So, number of students in AI = number of students in ML = 210

So, total number of students in CS = 210

$K = 30$

So, in Non CS, AI students = 60, in Non CS, ML students = 150

Also, $3y + 5y + 2y = 210$ implies $y = 21$.

So, we can put values for the first row.

				A	B	C	F
CS	7k	AI	63	105	42	0	
		ML	72	90	36	12	
NON	2k	AI	0				18
CS	5k	ML					18

By taking 4th direction, we can have the final table as below:

				A	B	C	F
CS	7k	AI	63	105	42	0	
		ML	72	90	36	12	
NON	2k	AI	0	21	21	18	
CS	5k	ML	27	75	30	18	

12 students failed in ML.

QNo:- 27 ,Correct Answer:- 27

Explanation:- From directions 1, 2, 3, 5, 6; we can fill the table as below.

				A	B	C	F
CS	7k	AI	3y	5y	2y	0	
		ML	4x	5x	2x	z	
NON	2k	AI	0				x
CS	5k	ML					x

From 7th direction, Total number of non CS students failing in one of the two courses : CS student failing in one of the two courses = 3:1

$2x:z = 3:1$

$Z = 2x/3$

From 8th direction, $z + x = 30$

$5x/3 = 80$

$X = 18$

So, we can fill values in the table:

				A	B	C	F
CS	7k	AI	3y	5y	2y	0	
		ML	72	90	36	12	
NON	2k	AI	0				18
CS	5k	ML					18

Also, every student take both the courses in CS. So, number of students in AI = number of students in ML = 210

So, total number of students in CS = 210

$K = 30$

So, in Non CS, AI students = 60, in Non CS, ML students = 150

Also, $3y + 5y + 2y = 210$ implies $y = 21$.



So, we can put values for the first row.

			A	B	C	F
CS	7k	AI	63	105	42	0
			ML	72	90	36
NON	2k	AI	0			18
CS	5k	ML				18

By taking 4th direction, we can have the final table as below:

			A	B	C	F
CS	7k	AI	63	105	42	0
			ML	72	90	36
NON	2k	AI	0	21	21	18
CS	5k	ML	27	75	30	18

27 non CS students got A grade in ML.

QNo:- 28 ,Correct Answer:- C

Explanation:- From directions 1, 2, 3, 5, 6; we can fill the table as below.

			A	B	C	F
CS	7k	AI	3y	5y	2y	0
			ML	4x	5x	2x
NON	2k	AI	0			x
CS	5k	ML				x

From 7th direction, Total number of non CS students failing in one of the two courses : CS student failing in one of the two courses = 3:1

$2x:z = 3:1$

$Z = 2x/3$

From 8th direction, $z + x = 30$

$5x/3 = 80$

$X = 18$

So, we can fill values in the table:

			A	B	C	F
CS	7k	AI	3y	5y	2y	0
			ML	72	90	36
NON	2k	AI	0			18
CS	5k	ML				18

Also, every student take both the courses in CS. So, number of students in AI = number of students in ML = 210

So, total number of students in CS = 210

$K = 30$

So, in Non CS, AI students = 60, in Non CS, ML students = 150

Also, $3y + 5y + 2y = 210$ implies $y = 21$.

So, we can put values for the first row.

			A	B	C	F
CS	7k	AI	63	105	42	0
			ML	72	90	36
NON	2k	AI	0			18
CS	5k	ML				18

By taking 4th direction, we can have the final table as below:

				A	B	C	F
CS	7k	AI	63	105	42	0	
		ML	72	90	36	12	
NON	2k	AI	0	21	21	18	
CS	5k	ML	27	75	30	18	

63.

QNo:- 29 ,Correct Answer:- D

Explanation:- From directions 1, 2, 3, 5, 6; we can fill the table as below.

				A	B	C	F
CS	7k	AI	3y	5y	2y	0	
		ML	4x	5x	2x	z	
NON	2k	AI	0			x	
CS	5k	ML				x	

From 7th direction, Total number of non CS students failing in one of the two courses : CS student failing in one of the two courses = 3:1
 $2x:z = 3:1$

$Z = 2x/3$

From 8th direction, $z + x = 30$

$5x/3 = 80$

$X = 18$

So, we can fill values in the table:

				A	B	C	F
CS	7k	AI	3y	5y	2y	0	
		ML	72	90	36	12	
NON	2k	AI	0			18	
CS	5k	ML				18	

Also, every student take both the courses in CS. So, number of students in AI = number of students in ML = 210

So, total number of students in CS = 210

$K = 30$

So, in Non CS, AI students = 60, in Non CS, ML students = 150

Also, $3y + 5y + 2y = 210$ implies $y = 21$.

So, we can put values for the first row.

				A	B	C	F
CS	7k	AI	63	105	42	0	
		ML	72	90	36	12	
NON	2k	AI	0			18	
CS	5k	ML				18	

By taking 4th direction, we can have the final table as below:

				A	B	C	F
CS	7k	AI	63	105	42	0	
		ML	72	90	36	12	
NON	2k	AI	0	21	21	18	
CS	5k	ML	27	75	30	18	

75

QNo:- 30 ,Correct Answer:- B

Explanation:- We know that in 1980, total number of males = total number of females = 1000.

Also, $1000 = \text{Deaths} + \text{alive people}$

So, number of deaths of males = $1000 - (180 + 205 + 160 + 100) = 355$
Number of deaths of females = $1000 - (210 + 175 + 150 + 120) = 345$
So, required ratio = $355:345 = 71:69$
So, required ratio = $355:345 = 71:69$

QNo:- 31 ,Correct Answer:- A

Explanation:- If a person falls in the age group (30-40), he/she should fall in (60-70) age group in 2010. So, in third graph, $(90+100) = 190$ would be the answer.

QNo:- 32 ,Correct Answer:- C

Explanation:- Less than 30 years means, we need to take 10-20, 20-30 categories. In 2020, these people would fall in 50-60, 60-70 age group categories. So, answer = $140 + 125 + 50 + 100 + 105 + 60 = 470$. Hence 3rd option.

QNo:- 33 ,Correct Answer:- 40

Explanation:- In 2000, these people will fall in 40-50.
In 2010, these people will fall in 50-60.
In 2000, 205 male survivors were there.
In 2010, 165 male survivors were there.
That means $205 - 165 = 40$ died in the given period.

QNo:- 34 ,Correct Answer:- 30

Explanation:- In 1980, age (20-30)
If age (50-60) then year must be 2010.
From given bar graph, in 2010, 145 females were alive in the age group 50-60.
But in 2020, 105 females were alive in the age group 60-70.
i.e. $145 - 105 = 40$ females died when they were of (50-60) age.

QNo:- 35 ,Correct Answer:- D

Explanation:- Let the denotation for Levmosto = L, Tyhrmosto = T, Pesmosto = P and Kitmosto = K
The total number of new cases in the city over five-day period
 $= 12 + 12 + 5 + 14 = 43$
Since the new cases in the city kept on increasing every day with Day 3 is exactly one more case than Day 2, the only possibility of new cases for-
Day 1 = 5, Day 2 = 8, Day 3 = 9, Day 4 = 10 and Day 5 = 11, Total = 43
Further, there is at least one new case on Day 1
Only possibility for Day 1,
 $L = 1$ case, $T = 1$ case, $P = 1$ case and $K = 2$ cases, Total = 5 cases
Also, K is the only place to have 3 new cases on Day 2
And to have total of 12 cases in each L and T
Day 2 = 2 cases, Day 3 = 3 cases, Day 4 = 3 cases and Day 5 = 3 cases
The rest of given information can be gathered as follows-

	Levmisto	Tyhrmisto	Pesmisto	Kitmisto	Total
Day 1	1	1	1	2	5
Day 2	2	2	1	3	8
Day 3	3	3	0	3	9
Day 4	3	3	1	3	10
Day 5	3	3	2	3	11
Total	12	12	5	14	43

Now we are ready to answer the questions.
The total number of new cases in the city on Day 2 = exactly 8

QNo:- 36 ,Correct Answer:- B

Explanation:- Let the denotation for Levmosto = L, Tyhrmosto = T, Pesmosto = P and Kitmosto = K
The total number of new cases in the city over five-day period
 $= 12 + 12 + 5 + 14 = 43$
Since the new cases in the city kept on increasing every day with Day 3 is exactly one more case than Day 2, the only possibility of new cases for-
Day 1 = 5, Day 2 = 8, Day 3 = 9, Day 4 = 10 and Day 5 = 11, Total = 43



Further, there is at least one new case on Day 1

Only possibility for Day 1,

$L = 1$ case, $T = 1$ case, $P = 1$ case and $K = 2$ cases, Total = 5 cases

Also, K is the only place to have 3 new cases on Day 2

And to have total of 12 cases in each L and T

Day 2 = 2 cases, Day 3 = 3 cases, Day 4 = 3 cases and Day 5 = 3 cases

The rest of given information can be gathered as follows-

	Levmisto	Tyhrmisto	Pesmisto	Kitmisto	Total
Day 1	1	1	1	2	5
Day 2	2	2	1	3	8
Day 3	3	3	0	3	9
Day 4	3	3	1	3	10
Day 5	3	3	2	3	11
Total	12	12	5	14	43

Now we are ready to answer the questions.

The number of new cases in Levmisto on Day 3 = exactly 3

QNo:- 37 ,Correct Answer:- A

Explanation:- Let the denotation for Levmisto = L, Tyhrmisto = T, Pesmisto = P and Kitmisto = K

The total number of new cases in the city over five-day period

$= 12 + 12 + 5 + 14 = 43$

Since the new cases in the city kept on increasing every day with Day 3 is exactly one more case than Day 2, the only possibility of new cases for- Day 1 = 5, Day 2 = 8, Day 3 = 9, Day 4 = 10 and Day 5 = 11, Total = 43

Further, there is at least one new case on Day 1

Only possibility for Day 1,

$L = 1$ case, $T = 1$ case, $P = 1$ case and $K = 2$ cases, Total = 5 cases

Also, K is the only place to have 3 new cases on Day 2

And to have total of 12 cases in each L and T

Day 2 = 2 cases, Day 3 = 3 cases, Day 4 = 3 cases and Day 5 = 3 cases

The rest of given information can be gathered as follows-

	Levmisto	Tyhrmisto	Pesmisto	Kitmisto	Total
Day 1	1	1	1	2	5
Day 2	2	2	1	3	8
Day 3	3	3	0	3	9
Day 4	3	3	1	3	10
Day 5	3	3	2	3	11
Total	12	12	5	14	43

Now we are ready to answer the questions.

Only on Day 3, Pesmisto did not have any new case

QNo:- 38 ,Correct Answer:- B

Explanation:- Let the denotation for Levmisto = L, Tyhrmisto = T, Pesmisto = P and Kitmisto = K

The total number of new cases in the city over five-day period

$= 12 + 12 + 5 + 14 = 43$

Since the new cases in the city kept on increasing every day with Day 3 is exactly one more case than Day 2, the only possibility of new cases for- Day 1 = 5, Day 2 = 8, Day 3 = 9, Day 4 = 10 and Day 5 = 11, Total = 43

Further, there is at least one new case on Day 1

Only possibility for Day 1,

$L = 1$ case, $T = 1$ case, $P = 1$ case and $K = 2$ cases, Total = 5 cases

Also, K is the only place to have 3 new cases on Day 2

And to have total of 12 cases in each L and T

Day 2 = 2 cases, Day 3 = 3 cases, Day 4 = 3 cases and Day 5 = 3 cases

The rest of given information can be gathered as follows-

	Levmisto	Tyhrmisto	Pesmisto	Kitmisto	Total
Day 1	1	1	1	2	5
Day 2	2	2	1	3	8
Day 3	3	3	0	3	9
Day 4	3	3	1	3	10
Day 5	3	3	2	3	11

Total	12	12	5	14	43
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Now we are ready to answer the questions.

Statement A: There were 2 new cases in Tyhrmisto on Day 3

False

Statement B: There were no new cases in Pesmisto on Day 2

False

Hence, both Statement a and Statement b are false

QNo:- 39 ,Correct Answer:- B

Explanation:- Let the denotation for Levmosto = L, Tyhrmisto = T, Pesmisto = P and Kitmisto = K

The total number of new cases in the city over five-day period

$$= 12 + 12 + 5 + 14 = 43$$

Since the new cases in the city kept on increasing every day with Day 3 is exactly one more case than Day 2, the only possibility of new cases for- Day 1 = 5, Day 2 = 8, Day 3 = 9, Day 4 = 10 and Day 5 = 11, Total = 43

Further, there is at least one new case on Day 1

Only possibility for Day 1,

L = 1 case, T = 1 case, P = 1 case and K = 2 cases, Total = 5 cases

Also, K is the only place to have 3 new cases on Day 2

And to have total of 12 cases in each L and T

Day 2 = 2 cases, Day 3 = 3 cases, Day 4 = 3 cases and Day 5 = 3 cases

The rest of given information can be gathered as follows-

	Levmisto	Tyhrmisto	Pesmisto	Kitmisto	Total
Day 1	1	1	1	2	5
Day 2	2	2	1	3	8
Day 3	3	3	0	3	9
Day 4	3	3	1	3	10
Day 5	3	3	2	3	11
Total	12	12	5	14	43

Now we are ready to answer the questions.

On all 5 days Levmosto and Tyhrmisto have the same number of new cases

QNo:- 40 ,Correct Answer:- C

Explanation:- Since the total amount among them = Rs.40

Some of the values can be distributed as follows.

	Pulak	Qasim	Ritesh	Suresh	Total	Players Grouping
Beginning	Rs.10	Rs.10	Rs.10	Rs.10	Rs.40	
Round 1	+ 2	- 2	0	0		P and Q R and S
	Rs.12	Rs.8	Rs.10	Rs.10	Rs.40	
Round 2	+ 1	+ 2	- 1	- 2		P and R Q and S
	Rs.13	Rs.10	Rs.9	Rs.8	Rs.40	
Round 3	-1	+1	-2	+2		P and Q R and S
	Rs.12	Rs.11	Rs.7	Rs.10	Rs.40	
	- 2	+ 1	- 1	+ 2		P and S R and Q
Round 4	0	0	- 2	+ 2		P and Q R and S
	Rs.11	Rs.11	Rs.6	Rs.12	Rs.40	
Round 5	- 1	- 1	+ 1	+ 1		P and S Q and R
	Rs.10	Rs.10	Rs.7	Rs.13	Rs.40	
Round 6	+ 2	+ 1	- 2	- 1		P and R Q and S
	Rs.12	Rs.11	Rs.5	Rs.12	Rs.40	
Round 7	0	+ 1	- 1	0		P and S Q and R
	Rs.12	Rs.12	Rs.4	Rs.12	Rs.40	
Round 8	+ 1	- 1	+ 2	- 2		P and Q R and S
	Rs.13	Rs.11	Rs.6	Rs.10	Rs.40	

Now we can answer the questions.



Rs.4 is the minimum amount Ritesh has in any round, so he must have won in Round 8 and gained Rs.2. hence, the amount of money that Ritesh had with him at the end of Round 8 = $4 + 2 = \text{Rs.}6$

QNo:- 41 ,Correct Answer:- D

Explanation:- Since the total amount among them = Rs.40
Some of the values can be distributed as follows.

	Pulak	Qasim	Ritesh	Suresh	Total	Players Grouping
Beginning	Rs.10	Rs.10	Rs.10	Rs.10	Rs.40	
Round 1	+ 2	- 2	0	0		P and Q R and S
	Rs.12	Rs.8	Rs.10	Rs.10	Rs.40	
Round 2	+ 1	+ 2	- 1	- 2		P and R Q and S
	Rs.13	Rs.10	Rs.9	Rs.8	Rs.40	
Round 3	-1	+1	-2	+2		P and Q R and S
	Rs.12	Rs.11	Rs.7	Rs.10	Rs.40	
Round 4	- 2	+ 1	- 1	+ 2		P and S R and Q
	Rs.11	Rs.11	Rs.8	Rs.10	Rs.40	
Round 5	0	0	- 2	+ 2		P and Q R and S
	Rs.11	Rs.11	Rs.6	Rs.12	Rs.40	
Round 6	- 1	- 1	+ 1	+ 1		P and S Q and R
	Rs.10	Rs.10	Rs.7	Rs.13	Rs.40	
Round 7	+ 2	+ 1	- 2	- 1		P and R Q and S
	Rs.12	Rs.11	Rs.5	Rs.12	Rs.40	
Round 8	0	+ 1	- 1	0		P and S Q and R
	Rs.12	Rs.12	Rs.4	Rs.12	Rs.40	
Round 8	+ 1	- 1	+ 2	- 2		P and Q R and S
	Rs.13	Rs.11	Rs.6	Rs.10	Rs.40	

Now we can answer the questions.

The money Suresh had in Round 5 = Rs.13 (maximum) and in Round 7 = Rs.12

The only possible way to reach such value is by losing Rs.1 in Round 6 and gaining 0 in Round 7

Also, the money Ritesh had in Round 5 = Rs.7 and in Round 7 = Rs.4

The only possible way to reach such value is by losing Rs.2 in Round 6 and losing Rs.1 in Round 7

Considering that, the amount of money that Pulak had with him at the end of Round 6 = $\text{Rs.}10 + 2 = \text{Rs.}12$

QNo:- 42 ,Correct Answer:- 6

Explanation:- Since the total amount among them = Rs.40
Some of the values can be distributed as follows.

	Pulak	Qasim	Ritesh	Suresh	Total	Players Grouping
Beginning	Rs.10	Rs.10	Rs.10	Rs.10	Rs.40	
Round 1	+ 2	- 2	0	0		P and Q R and S
	Rs.12	Rs.8	Rs.10	Rs.10	Rs.40	
Round 2	+ 1	+ 2	- 1	- 2		P and R Q and S
	Rs.13	Rs.10	Rs.9	Rs.8	Rs.40	
Round 3	-1	+1	-2	+2		P and Q R and S
	Rs.12	Rs.11	Rs.7	Rs.10	Rs.40	
Round 4	- 2	+ 1	- 1	+ 2		P and S R and Q
	Rs.11	Rs.11	Rs.8	Rs.10	Rs.40	
Round 5	0	0	- 2	+ 2		P and Q R and S
	Rs.11	Rs.11	Rs.6	Rs.12	Rs.40	
Round 6	- 1	- 1	+ 1	+ 1		P and S Q and R
	Rs.10	Rs.10	Rs.7	Rs.13	Rs.40	
Round 7	+ 2	+ 1	- 2	- 1		P and R Q and S
	Rs.12	Rs.11	Rs.5	Rs.12	Rs.40	



Round 7	0	+ 1	- 1	0	P and S	Q and R
	Rs.12	Rs.12	Rs.4	Rs.12	Rs.40	
Round 8	+ 1	- 1	+ 2	- 2	P and Q	R and S
	Rs.13	Rs.11	Rs.6	Rs.10	Rs.40	

Now we can answer the questions.

The money (in Rs.) Ritesh had at the end of Round 4 = Rs.6

QNo:- 43 ,Correct Answer:- 6

Explanation:- Since the total amount among them = Rs.40

Some of the values can be distributed as follows.

	Pulak	Qasim	Ritesh	Suresh	Total	Players Grouping
Beginning	Rs.10	Rs.10	Rs.10	Rs.10	Rs.40	
Round 1	+ 2	- 2	0	0	P and Q	R and S
	Rs.12	Rs.8	Rs.10	Rs.10	Rs.40	
Round 2	+ 1	+ 2	- 1	- 2	P and R	Q and S
	Rs.13	Rs.10	Rs.9	Rs.8	Rs.40	
Round 3	-1	+1	-2	+2	P and Q	R and S
	Rs.12	Rs.11	Rs.7	Rs.10	Rs.40	
Round 4	- 2	+ 1	- 1	+ 2	P and S	R and Q
	Rs.11	Rs.11	Rs.8	Rs.10	Rs.40	
Round 5	0	0	- 2	+ 2	P and Q	R and S
	Rs.11	Rs.11	Rs.6	Rs.12	Rs.40	
Round 6	- 1	- 1	+ 1	+ 1	P and S	Q and R
	Rs.10	Rs.10	Rs.7	Rs.13	Rs.40	
Round 7	+ 2	+ 1	- 2	- 1	P and R	Q and S
	Rs.12	Rs.11	Rs.5	Rs.12	Rs.40	
Round 8	0	+ 1	- 1	0	P and S	Q and R
	Rs.12	Rs.12	Rs.4	Rs.12	Rs.40	
Round 9	+ 1	- 1	+ 2	- 2	P and Q	R and S
	Rs.13	Rs.11	Rs.6	Rs.10	Rs.40	

Now we can answer the questions.

6 games were played with a bet of Rs.2.

QNo:- 44 ,Correct Answer:- 1

Explanation:- Since the total amount among them = Rs.40

Some of the values can be distributed as follows.

	Pulak	Qasim	Ritesh	Suresh	Total	Players Grouping
Beginning	Rs.10	Rs.10	Rs.10	Rs.10	Rs.40	
Round 1	+ 2	- 2	0	0	P and Q	R and S
	Rs.12	Rs.8	Rs.10	Rs.10	Rs.40	
Round 2	+ 1	+ 2	- 1	- 2	P and R	Q and S
	Rs.13	Rs.10	Rs.9	Rs.8	Rs.40	
Round 3	-1	+1	-2	+2	P and Q	R and S
	Rs.12	Rs.11	Rs.7	Rs.10	Rs.40	
Round 4	- 2	+ 1	- 1	+ 2	P and S	R and Q
	Rs.11	Rs.11	Rs.8	Rs.10	Rs.40	
Round 5	0	0	- 2	+ 2	P and Q	R and S
	Rs.11	Rs.11	Rs.6	Rs.12	Rs.40	
Round 6	- 1	- 1	+ 1	+ 1	P and S	Q and R
	Rs.10	Rs.10	Rs.7	Rs.13	Rs.40	



Round 6	+ 2	+ 1	- 2	- 1		P and R	Q and S
	Rs.12	Rs.11	Rs.5	Rs.12	Rs.40		
Round 7	0	+ 1	- 1	0		P and S	Q and R
	Rs.12	Rs.12	Rs.4	Rs.12	Rs.40		
Round 8	+ 1	- 1	+ 2	- 2		P and Q	R and S
	Rs.13	Rs.11	Rs.6	Rs.10	Rs.40		

Now we can answer the questions.
Pulak and Suresh made a pair in round 5.

Section : Quantitative Ability

QNo:- 45 ,Correct Answer:- A

We know that $\frac{\text{Men} \times \text{Days} \times \text{hours}}{\text{work}} = \text{constant}$

$$\text{So, } \frac{M_1 D_1 H_1}{W_1} = \frac{M_2 D_2 H_2}{W_2}$$

Explanation:-

Now, in given question,

$M_1 = N$	$M_2 = N - 10$
$D_1 = 10$	$D_2 = 14$
$H_1 = 7$	$H_2 = 10$
$W_1 = 35$	$W_2 = 65$

$$\text{So, } \frac{N \times 10 \times 7}{35} = \frac{(N - 10) \times 14 \times 10}{65} \Rightarrow N = 140$$

QNo:- 46 ,Correct Answer:- 12

Explanation:- Let us assume

No. of 100 Rs. Cheques = x
 No. of 250 Rs. Cheques = y
 No. of 500 Rs. Cheques = z

provided x, y, z should be integers

$$\text{Given } x + y + z = 100 ; 100x + 250y + 500z = 15250$$

Eliminating x, we get $3y + 8z = 105$

We want to maximise z. If we take $z = 12, y = 3$

No other value of z which is greater than 12 will satisfy equation.

So, answer is 12.

QNo:- 47 ,Correct Answer:- D

Explanation:- We know that if N is an n-digit number containing digit A (a times, say), B (b times, say) then

No. of possible numbers made by using the digits of N = $\frac{n!}{a!b! \dots}$

Sum of such nos. = $\frac{n!}{a!b! \dots} \times (\text{SOD}) \times (11 \dots 1) \text{ n times}$ Where SOD = sum of digits

Required Arithmetic mean = $\frac{\text{Sum of nos}}{\text{number of nos}}$

$$= \frac{\frac{3!}{2!} (1111) (1 + 4 + 2 + 1)}{\frac{4!}{2!}} = 2222$$

QNo:- 48 ,Correct Answer:- 60

Explanation:- Let S_m = steps taken by moody in a second when escalator is not moving'

S_e = step taken by escalator in a second.

Let N = number of steps visible when escalator is not moving



$$\text{So, } S_m + S_e = \frac{N}{30}$$

$$2 S_m + S_e = \frac{N}{20}$$

$$\text{By solving, } S_e = \frac{N}{60}$$

So, required time = 60 seconds

QNo:- 49 ,Correct Answer:- B

Explanation:- Sum of the three sides of a quadrilateral is greater than the fourth side.

Therefore, let the fourth side be

$$1 + 2 + 4 > x \text{ or } x < 7$$

$$1 + 2 + x > 4 \text{ or } x > 1$$

Possible values of d are 2, 3, 4, 5 and 6.

QNo:- 50 ,Correct Answer:- B

$$\frac{x^2 - 6x + 10}{3 - x} = \frac{x^2 - 6x + 9 + 1}{3 - x} = \frac{(3 - x)^2 + 1}{3 - x} = 3 - x + \frac{1}{3 - x}$$

Since $x < 3 \Rightarrow 3 - x > 0$. Also $\frac{1}{3 - x} > 0$

Also, we know $\left(y + \frac{1}{y}\right)$'s minimum value is 2.

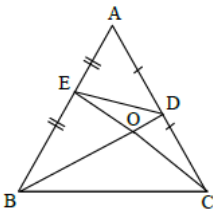
Explanation:-

So, Ans. is 2nd option i.e. 2

Proof of $\left(y + \frac{1}{y}\right)$'s minimum value

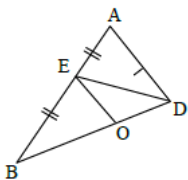
$$\text{If } y \text{ is +ve; then we know A.M.} \geq \text{G.M. } \frac{y + \frac{1}{y}}{2} \geq \sqrt{y \times \frac{1}{y}} \Rightarrow y + \frac{1}{y} \geq 2.$$

QNo:- 51 ,Correct Answer:- 9



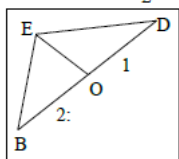
Explanation:-

We know that median always divides the into two equal parts area wise. So, ΔABD 's Area = $\frac{1}{2} \times 108 = 54$ sq units as BD is a median of ΔABC .



If we consider ΔABD , ED is median

$$\text{So, Ar } (\Delta BED) = \frac{1}{2} \times 54 = 27 \text{ squnits.}$$



Since O is centroid and divides median in 2 : 1.

$$\text{Ar } (\Delta EOD) = \frac{1}{3} \times 27 = 9 \text{ squnits.}$$

QNo:- 52 ,Correct Answer:- 11

Explanation:- B can finish job in 40 days. Since A is twice as fast as B. Since A can finish job in 20 days. Similarly C can finish job in 60 days.

Let us assume total work is 120 unit

So, A's 1 day work = 6 u
 B's 1 day work = 3 u
 C's 1 day work = 2 u

Order of their working is,
AB, BC, CA, AB, BC, CA, -----

In span of 3 days, work done = 2 (6 + 3 + 2) = 22 u.
 So, In span of 15 (i.e. 3 × 5) days, work done = 22 × 5 = 110 u.
 On 16th day, AB together will do 9 units of work.
 On 17th day, BC will work together to finish remaining 1 unit of work.
 So, in these 17 days, A will work for 2 × 5 + 1 = 11 days.

QNo:- 53 ,Correct Answer:- A

Explanation:- We will go by option:

Let us check at $x = r$

$$\begin{aligned} f(f(x)) &= f(2x - r) \text{ (by definition)} \\ &= f(2x - r) \\ &= f(r) \\ &= 2x - r = r = f(x) \end{aligned}$$

So, $f(f(x)) = f(x)$ when $x = r$.

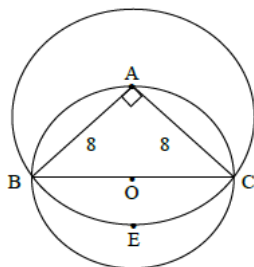
So, option (3) & (4) are out.

Now let us assume $x < r$

$$\begin{aligned} f(f(x)) &= f^{\circledast} \text{ (by definition)} \\ &= 2r - r \quad \text{(Since } r = r) \\ &= r \\ &= f(x) \end{aligned}$$

So, option (1) is answer

QNo:- 54 ,Correct Answer:- A



Explanation:-

Since ABC is an isosceles

$$\text{Right angled } \Delta \text{ So, } BC = \sqrt{8^2 + 8^2} = 8\sqrt{2}$$

$$\text{So, radius} = 4\sqrt{2}$$

Area of Semi - circle with

$$\text{diameter } BC = \frac{1}{2} \times \pi (4\sqrt{2})^2 = 16\pi$$

Area of the segment BEOC

$$= \text{Area of sector} - \text{Area of } \Delta ABC$$

$$= \frac{90}{360} \times \pi (8)^2 - \frac{1}{2} \times 8 \times 8 = 16\pi - 32$$

$$\text{So, area of the overlapping region} = 16\pi + 16\pi - 32 = 32(\pi - 1)$$

QNo:- 55 ,Correct Answer:- B

	Glass		Cup	
	Milk	Water	Milk	Water
Original	500	0	0	500
1 st transfer	350	0	150	500
2 nd transfer	$350 + \frac{3}{13} \times 150$	$\frac{10}{13} \times 150$	$150 - \frac{3}{13} \times 150$	$500 - \frac{10}{13} \times 150$

Explanation:-

$$\text{Required ratio} = \frac{10}{13} \times 150 : 150 - \frac{3}{13} \times 150 = 1 : 1$$

QNo:- 56 ,Correct Answer:- 14

$$\left(\sqrt{\frac{7}{5}}\right)^{3x-y} = \frac{875}{2401} \Rightarrow \left(\sqrt{\frac{7}{5}}\right)^{\frac{3x-y}{2}} = \frac{7 \times 5^3}{7^4} = \left(\frac{5}{7}\right)^3 = \left(\frac{7}{5}\right)^{-3}$$

$$\Rightarrow \frac{3x-y}{2} = -3 \Rightarrow 3x - y = -6 \quad \text{---(1)}$$

Explanation:-

$$\text{Also, } \left(\frac{4a}{b}\right)^{6x-y} = \left(\frac{2a}{b}\right)^{y-6x} \Rightarrow (2^2)^{6x-y} \left(\frac{a}{b}\right)^{6x-y} = 2^{y-6x} \left(\frac{a}{b}\right)^{y-6x}$$

$$\text{If we compare alike bases, we get } 6x - y = y - 6x \Rightarrow y = 6x. \quad \text{---(2)}$$

Put (2) in (1),

$$x = 2, y = 12.$$

$$\text{So, } x + y = 14.$$

QNo:- 57 ,Correct Answer:- 63

Explanation:- Given

	Avg.	No. of students
A	32	x
B	60	x + 10

$$\begin{aligned} \text{Pooled Average} &= \frac{32x + 60(x+10)}{x+x+10} = \frac{92x + 600}{2x+10} = \frac{46x + 300}{x+5} \\ &= \frac{46(x+5) + 70}{x+5} = 46 + \frac{70}{x+5} = \text{integer} \end{aligned}$$

So, $x + 5$ is a factor of 70.

$$x + 5 = 70 \text{ (Max), } 7 \text{ (Min)}$$

$$x = 65 \text{ (Max), } 2 \text{ (Min)}$$

$$\text{Required difference} = 65 - 2 = 63.$$

QNo:- 58 ,Correct Answer:- B

Explanation:- $2x^2 + kx + 5 = 0$ has no real roots. So, $D < 0$

$$\Rightarrow k^2 - 40 < 0 \Rightarrow k^2 < 40 \Rightarrow k \leq 6 \text{ } (\because k \text{ is an integer}) \quad \text{---(1)}$$

Also, $x^2 + (k-5)x + 1 = 0$ has 2 distinct real roots.

$$\text{So, } D > 0 \Rightarrow (k-5)^2 - 4 \times 1 \times 1 > 0$$

$$\Rightarrow k^2 - 10k + 21 > 0$$

$$\Rightarrow (k-3)(k-7) > 0$$

$$\Rightarrow k < 3 \text{ or } k > 7 \quad \text{---(2)}$$

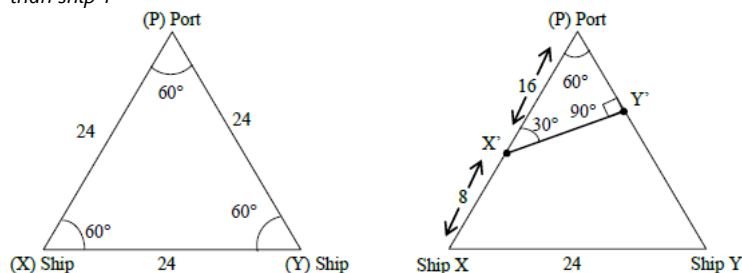
So, $k = 2, 1, 0, -1, -2, -3, -4, -5, -6$ i.e. 9 values.

QNo:- 59 ,Correct Answer:- A

Explanation:- Starting stage of ships =

Let ship x is slower

than ship Y



When ship x has travelled 8 kms., $P X' Y'$ becomes right angled Δ .

Of course, $P X' > P Y'$

$$\text{So, } \angle P Y' X' = 90^\circ$$

$$P Y' = 8 \text{ (By manipulating } 30^\circ - 60^\circ - 90^\circ \text{ combination)}$$

i.e. ship Y has covered $24 - 8 = 16$ kms.

So ratio of their speeds is 2 : 1

When ship Y will reach the port P (i.e. 8 kms); ship X must have covered 4 kms. So, remaining distance = $24 - (8 + 4) = 12$ kms

QNo:- 60 ,Correct Answer:- 150

Explanation:- By looking at the first line of the question, we can say number of students should be of type $9k + 4$, $10m + 4$, $12l + 4$, $25s + 4$ & $11t$.
So, let us try to find the number which when divided by 9, 10, 12 or 25 is leaving remainder 4.
i.e. number should be of type p ($\text{LCM}(9, 10, 12, 25) + 4 = 900p + 4$)

$$= 891p + (9p + 4)$$

i.e. $9p + 4$ should be divisible by 11.

$\Rightarrow p = 2, 13, 24, \dots$ The greatest number of student is 1804.

So at the most 15 teams can be made.

QNo:- 61 ,Correct Answer:- A

Explanation:- Given speed of slower car = 60 kmph.
It is given that both cars took 1.5 hours to meet if travelling towards each other.
So, Required distance = $60 \times 1.5 = 90$ kms.

QNo:- 62 ,Correct Answer:- A

Explanation:- Let $a < b < c < d < e < f$ be 6 distinct natural numbers.
Given $e + f = 56$, $a + b = 28$
If average of all 6 numbers to be maximised, c & d has to be maximum i.e. 'e' has to be maximum.
So, $e = 27$, $f = 29$. Therefore, we can take $d = 26$, $25 = c$

$$\text{Reqd. Avg.} = \frac{(a+b)+c+d+(e+f)}{6} = \frac{28+26+25+56}{6} = 22.5$$

QNo:- 63 ,Correct Answer:- C

$$\begin{aligned} C &= \frac{16x}{y} + \frac{49y}{x} \\ &= 16\left(\frac{x}{y}\right) + \frac{49}{\left(\frac{x}{y}\right)} \\ &= \frac{16\left(\frac{x}{y}\right)^2 + 49}{\left(\frac{x}{y}\right)} \Rightarrow 16\left(\frac{x}{y}\right)^2 - \left(\frac{x}{y}\right)C + 49 = 0 \end{aligned}$$

$$\text{Let } \frac{x}{y} = s$$

Explanation:-

So, equation becomes, $16s^2 - Cs + 49 = 0$

Since x & y are real & non-zero, $\frac{x}{y}$ is also

Real $D = b^2 - 4ac \geq 0$

$$\Rightarrow C^2 - 4 \times 16 \times 49 \geq 0$$

$$\Rightarrow C^2 \geq (2 \times 4 \times 7)^2$$

$$\Rightarrow C \leq -56 \text{ or } C \geq 56$$

So, -50 is not possible option 3 is the answer

QNo:- 64 ,Correct Answer:- 548

Explanation:- All the terms in given A.P are of the form $(17k + 4)$ where $k = 2, 3, 4, \dots$

We can observe $k = 16$ will give first 3 digit term of the given AP.

So, 106 will be the first term.

Let us find greatest 3 digit term of the given A.P

999 when divided by 17 gives remainder 13.

So, 986 is the greatest 3 digit number which is divisible by 17. i.e. $986 + 4 = 990$ is the required number.



So, said sum will be the A.P 106, 123,, 990

$$\text{Number of terms} = \frac{990 - 106}{17} + 1 = \frac{884}{17} + 1 = 52$$

$$\text{Average} = \frac{106 + 990}{2} = 548$$

QNo:- 65 ,Correct Answer:- D

Since a, b, c, m, n are integers. So, other roots of both equations are $3 - 2\sqrt{2}$ & $4 - 2\sqrt{3}$ respectively.

Eq. having $3 + 2\sqrt{2}$ & $3 - 2\sqrt{2}$ roots:-

$$x^2 - (3 + 2\sqrt{2} + 3 - 2\sqrt{2})x + (3 + 2\sqrt{2})(3 - 2\sqrt{2}) = 0$$

$$\Rightarrow x^2 - 6x + 1 = 0$$

Eq. having $4 - 2\sqrt{3}$ & $4 + 2\sqrt{3}$ roots:-

$$x^2 - 8x + 4 = 0$$

a = 1, b = -6, c = 1, m = -8, n = 4

Explanation:- So, $\frac{b}{m} + \frac{c - 2b}{n} = \frac{-6}{-8} + \frac{1 - 2(-6)}{4} = 4$

QNo:- 66 ,Correct Answer:- A

$$\text{Interest by bank A} = \frac{8000 \times 5.5}{100}$$

$$\text{Interest by bank B} = \frac{5000 \times 5.6}{100}$$

Explanation:- Interest by bank C = $\frac{7000 \times x}{100}$

$$\text{Given} = \frac{8000 \times 5.5}{100} + \frac{5000 \times 5.6}{100} + \frac{7000 \times x}{100} = \frac{20000 \times 5}{100}$$

$$\Rightarrow 440 + 280 + 70x = 1000 \Rightarrow x = 4$$

$$\text{Required interest} = \frac{20000 \times 4 \times 1}{100} = 800$$