

CAT 2024 Slot 1

VARC

Analytical (1-4)

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

.The idea of craftsmanship is not simply nostalgic.... Crafts require distinct skills, an all-round approach to work that involves the whole product, rather than individual parts, and an attitude that necessitates devotion to the job and a focus on the communal interest. The concept of craft emphasises the human touch and individual judgment.

Essentially, the crafts concept seems to run against the preponderant ethos of management studies which, as the academics note, have long prioritised efficiency and consistency.. Craft skills were portrayed as being primitive and traditionalist.

The contrast between artisanship and efficiency first came to the fore in the 19 century when British manufacturers suddenly faced competition from across the Atlantic as firms developed the "American system" using standardised parts... the worldwide success of the Singer sewing machine showed the potential of a mass-produced device. This process created its own reaction, first in the form of the Arts and Crafts movement of the late 19th century, and then again in the "small is beautiful" movement of the 1970s. A third crafts movement is emerging as people become aware of the environmental impact of conventional industry.

There are two potential markets for those who practise crafts. The first stems from the existence of consumers who are willing to pay a premium price for goods that are deemed to be of extra quality.... The second market lies in those consumers who wish to use their purchases to support local workers, or to reduce their environmental impact by taking goods to craftspeople to be mended, or recycled.

For workers, the appeal of craftsmanship is that it allows them the autonomy to make creative choices, and thus makes a job far more satisfying. In that sense, it could offer hope for the overall labour market. Let the machines automate dull and repetitive tasks

and let workers focus purely on their skills, judgment and imagination. As a current example, the academics cite the "agile" manifesto in the software sector, an industry at the heart of technological change. The pioneers behind the original agile manifesto promised to prioritise "individuals and interactions over processes and tools". By bringing together experts from different teams, agile working is designed to improve creativity.

But the broader question is whether crafts can create a lot more jobs than they do today. Demand for crafted products may rise but will it be easy to retrain workers in sectors that might get automated (such as truck drivers) to take advantage? In a world where products and services often have to pass through regulatory hoops, large companies will usually have the advantage.

History also suggests that the link between crafts and creativity is not automatic. Medieval craft guilds were monopolies which resisted new entrants. They were also highly hierarchical with young men required to spend long periods as apprentices and journeymen before they could set up on their own; by that time the innovative spirit may have been knocked out of them. Craft workers can thrive in the modern era, but only if they don't get too organised.

MODERATE

Q1. The author questions the ability of crafts to create substantial employment opportunities presently because

- A. crafts guilds tend to resist new entrants and are unlikely to accept large numbers of trainees.
- B. regulatory requirements could make it difficult for small crafts outfits to compete.
- C. workers made redundant by automation are unlikely to opt for crafts-related work.
- D. the low scale of crafts production will not be able to absorb the mass of redundant labour.

Answer Key: B

HARD

Q2. We can infer from the passage that medieval crafts guilds resembled mass production in that both

- A. focused excessively on product quality.
- B. discouraged innovation by restricting entry through strict rules.

- C. did not necessarily promote creativity.
- D. did not always employ egalitarian production processes.

Answer Key: C

MODERATE

Q3. The most recent revival in interest in the crafts is a result of the emergence of all of the following EXCEPT:

- A. support for individual creations as opposed to mass-produced objects.
- B. a niche market for discerning buyers of quality products.
- C. a greater interest in buying locally produced goods.
- D. concerns about the environmental impact of mass production

Answer Key: A

MODERATE

Q4. Which one of the following statements is NOT inconsistent with the views stated in the passage?

- A. Creativity in the crafts could be stifled if the market for artisan goods becomes too organised.
- B. The Arts and Crafts movement was initially inspired by the "American system" of production.
- C. We need to support the crafts; only then can we retain the creativity intrinsic to their production.
- D. The agile movement in software is a throwback to the tenets of the medieval crafts guilds.

Answer Key: A

EASY

Q5. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

Scientific research shows that many animals are very intelligent and have sensory and motor abilities that dwarf ours. Dogs are able to detect diseases such as cancer and

diabetes and warn humans of impending heart attacks and strokes. Elephants, whales, hippopotamuses, giraffes, and alligators use low-frequency sounds to communicate over long distances, often miles. Many animals also display wide-ranging emotions, including joy, happiness, empathy, compassion, grief, and even resentment and embarrassment. It's not surprising that animals share many emotions with us because we also share brain structures, located in the limbic system, that are the seat of our emotions.

- A. Animals are more intelligent than us in sensing danger and detecting diseases.
- B. The advanced sensory and motor abilities of animals is the reason why they can display wide- ranging emotions.
- C. The similarity in brain structure explains why animals show emotions typically associated with humans.
- D. Animals can show emotions which are typically associated with humans.

Answer Key: C

Argumentative/Persuasive (6-9)

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

Oftentimes, when economists cross borders, they are less interested in learning from others than in invading their garden plots. Gary Becker, for instance, pioneered the idea of human capital. To do so, he famously tackled topics like crime and domesticity, applying methods honed in the study of markets to domains of nonmarket life. He projected economics outward into new realms: for example, by revealing the extent to which humans calculate marginal utilities when choosing their spouses or stealing from neighbors. At the same time, he did not let other ways of thinking enter his own economic realm: for example, he did not borrow from anthropology or history or let observations of nonmarket economics inform his homo economicus. Becker was a picture of the imperial economist in the heyday of the discipline's bravura.

Times have changed for the once almighty discipline. Economics has been taken to task, within and beyond its ramparts. Some economists have reached out, imported, borrowed, and collaborated- been less imperial, more open. Consider Thomas Piketty and his outreach to historians. The booming field of behavioral economics, the fusion of economics and social psychology is another case. Having spawned active subfields, like judgment, decision-making and a turn to experimentation, the field aims to go beyond the caricature of Rational Man to explain how humans make decisions.....

It is important to underscore how this flips the way we think about economics. For generations, economists have presumed that people have interests -"preferences," in the neoclassical argot that get revealed in the course of peoples' choices. Interests come before actions and determine them. If you are hungry, you buy lunch; if you are cold, you get a sweater. If you only have so much money and can't afford to deal with both your growling stomach and your shivering, which need you choose to meet using your scarce savings reveals your preference.

Psychologists take one look at this simple formulation and shake their heads. Increasingly, even some mainstream economists have to admit that homo economicus doesn't always behave like the textbook maximizer; irrational behavior can't simply be waved away as extra-economic expressions of passions over interests, and thus the domain of other disciplines... This is one place where the humanist can help the economist. If narrative economics is going to help us understand how rivals duke it out, who wins and who loses, we are going to need much more than lessons from epidemiological studies of viruses or intracranial stimuli.

Above all, we need politics and institutions. Shiller [the Nobel prize winning economist] connects perceptions of narratives to changes in behavior and thence to social outcomes. He completes a circle that was key to behavioral economics and brings in storytelling to make sense of how perceptions get framed. This cycle (perception to behavior to society) was once mediated or dominated by institutions: the political parties, lobby groups, and media organizations that played a vital role in legitimating, representing, and excluding interests. Yet institutions have been stripped from Shiller's account, to reveal a bare dynamic of emotions and economics, without the intermediating place of politics.

MODERATE

Q6. In the first paragraph the author is making the point that economists like Becker

- A. had begun to borrow concepts from other disciplines but were averse to the latter applying economic principles.
- B. benefitted from the application of their principles and concepts to non-economic phenomena.
- C. used economics to analyse non-market behaviour, without incorporating perspectives from other areas of inquiry.

D. tended to guard their discipline from poaching by academics from other subject areas.

Answer Key: C

MODERATE

Q7. "Times have changed for the once almighty discipline." We can infer from this statement and the associated paragraph that the author is being

- A. sarcastic about how economists, who earlier shunned other disciplines, are now beginning to incorporate them in their analyses.
- B. critical of economists openly borrowing and collaborating across disciplines to explain how humans make decisions.
- C. judgemental about the ability of economic tools to accurately manage crises leading to the downfall of this lofty science.
- D. disparaging of economists' inability to precisely predict market behaviour, and are now borrowing from other disciplines to remedy this.

Answer Key: A

HARD

Q8. The author critiques Schiller's approach to behavioural economics for

- A. denigrating the role of institutions while creating a link between behavioural economics and perceptions.
- B. linking emotions and rational behaviour without considering the mediation of social institutions.
- C. ignoring the marginal role that media and politics play in influencing people's behaviour.
- D. relying excessively on storytelling as the main influence on the formation of perceptions.

Answer Key: B

MODERATE

Q9. We can infer from the passage that the term "homo economic us" refers to someone

- A. maximises their opportunities based on nonmarket choices.
- B. makes rational decisions based on their own preferences.
- C. believes in borrowing and collaborating with other disciplines in their work.
- D. is not influenced by the preferences and choices of others.

Answer Key: B

MODERATE

Q10. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide where (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: Comprehending a wide range of emotions, Renaissance music nevertheless portrayed all emotions in a balanced and moderate fashion.

Paragraph: A volume of translated Italian madrigals were published in London during the year of 1588. This sudden public interest facilitated a surge of English Madrigal writing as well as a spurt of other secular music writing and publication. __ (1)__. This music boom lasted for thirty years and was as much a golden age of music as British literature was with Shakespeare and Queen Elizabeth __ (2)__. The rebirth in both literature and music originated in Italy and migrated to England; the English madrigal became more humorous and lighter in England as compared to Italy. Renaissance music was mostly polyphonic in texture. __ (3)__. Extreme use of and contrasts in dynamics, rhythm, and tone colour do not occur. __ (4)__. The rhythms in Renaissance music tend to have a smooth, soft flow instead of a sharp, well-defined pulse of accents.

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

Answer Key: A

MODERATE

Q11. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide where (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: Understanding central Asia's role helps developments make more sense not only across Asia but in Europe, the Americas and Africa.

Paragraph: The nations of the Silk Roads are sometimes called 'developing countries', but they are actually some of the world's most highly developed countries, the very crossroads of civilization, in advanced states of disrepair. __ (1) __. These countries lie at the centre of global affairs: they have since the beginning of history, Running across the spine of Asia, they form a web of connections fanning out in every direction, routes along which pilgrims and warriors, nomads and merchants have travelled, goods and produce have been bought and sold, and ideas exchanged, adapted and refined. __ (2) __ They have carried not only prosperity, but also death and violence, disease and disaster. __ (3) __ The Silk Roads are the world's central nervous system, connecting otherwise far- flung peoples and places.... __ (4) __. It allows us to see patterns and links, causes and effects that remain invisible if one looks only at Europe, or North America.

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

Answer Key: B

MODERATE

Q12. Five jumbled up sentences (labelled 1, 2, 3, 4 and 5), related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd sentence and key in the number of that sentence as your answer.

1. Urbanites also have more and better options for getting around: Uber is ubiquitous; easy-to-rent dockless bicycles are spreading; battery-powered scooters will be next.
2. When more people use buses or trains the service usually improves because public-transport agencies run more buses and trains.
3. Worsening services on public transport, terrorist attacks in some urban metros and a rise in fares have been blamed for this trend.
4. It seems more likely that public transport is being squeezed structurally as people's need to travel is diminishing as a result of smartphones, video-conferencing, online shopping and so on.
5. There has been a puzzling decline in the use of urban public

transport in many countries in the west, despite the growth in urban populations and rising employment.

Answer Key: 2

Narrative (13-16)

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

Landing in Australia, the British colonists weren't much impressed with the small-bodied, slender-snouted marsupials called bandicoots. "Their muzzle, which is much too long, gives them an air exceedingly stupid," one naturalist noted in 1805. They nicknamed one type the "zebra rat" because of its black-striped rump.

Silly-looking or not, though, the zebra rat, the smallest bandicoot, more commonly known today as the western barred bandicoot exhibited a genius for survival in the harsh outback, where its ancestors had persisted for some 26 million years. Its births were triggered by rainfall in the bone-dry desert. It carried its breath-mint-size babies in a backward-facing pouch so mothers could forage for food and dig shallow, camouflaged shelters.

Still, these adaptations did not prepare the western barred bandicoot for the colonial-era transformation of its ecosystem, particularly the onslaught of imported British animals, from cattle and rabbits that were damaged. delicate desert vegetation to ravenous house cats that soon developed a taste for bandicoots. Several of the dozen-odd bandicoot species went extinct, and by the 1940s the western barred bandicoot, whose original range stretched across much of the continent, persisted only on two predator-free islands in Shark Bay, off Australia's western coast.

"Our isolated fauna had simply not been exposed to these predators," says Reece Pedler, an ecologist with the Wild Deserts conservation program.

Now Wild Deserts is using descendants of those few thousand island survivors, called Shark Bay bandicoots, in a new effort to seed a mainland bandicoot revival. They've imported 20 bandicoots to a preserve on the edge of the Strzelecki Desert, in the remote interior of New South Wales. This sanctuary is a challenging place, desolate

much of the year, with one of the world's most mercurial rainfall patterns, relentless droughts followed by sudden drenching floods.

The imported bandicoots occupy two fenced "exclosures," cleared of invasive rabbits (courtesy of Peddler's sheepdog) and of feral cats (which slunk off once the rabbits disappeared). A third fenced area contains the program's Wild Training Zone, where two other rare marsupials (bilbies, a larger type of bandicoot, and mulgaras, a somewhat fearsome fuzzball known for sucking the brains out of prey) currently share terrain with controlled numbers of cats, learning to evade them. It's unclear whether the Shark Bay bandicoots, which are perhaps even more predator-naive than their now-extinct mainland bandicoot kin, will be able to make that kind of breakthrough.

For now, though, a recent surge of rainfall has led to a bandicoot joey boom, raising the Wild Deserts population to about 100, with other sanctuaries adding to that number. There are also signs of rebirth in the landscape itself. With their constant digging, the bandicoots trap moisture and allow for seed germination so the cattle-damaged desert can restore itself. They have a new nickname—a flattering one, this time. "We call them ecosystem engineers," Pedler says.

EASY

Q13. According to the text, the western barred bandicoots now have a flattering name because they have

- A. led a revival in preserving the species.
- B. led to a surge and increase of rainfall.
- C. grown fivefold in terms of population.
- D. aided in altering an arid environment.

Answer Key: D

MODERATE

Q14. The text uses the word 'exclosures' because Wild Deserts has adopted a measure of

- A. ridding the main desert of feral cats and large bilbies.
- B. barring the entry of invasive species.

- C. excluding animals to make the islands predator-free.
- D. restoring cattle damaged deserts to green landscapes.

Answer Key: B

MODERATE

Q15. Which one of the following options does NOT represent the characteristics of the western barred bandicoot?

- A. Shallow diggers having an elongated muzzle
- B. Smallest black striped marsupial that uses camouflage and dig
- C. Look of a rat but with a baby pouch and a slender snout
- D. Long thin nose, black striped back, pouch for joeys

Answer Key: B

MODERATE

Q16. Which one of the following statements provides a gist of this passage?

- A. The negligent attitude of the British colonists towards these bandicoots evidenced by the names given to them led to their annihilation.
- B. A type of bandicoots was nearly wiped out by invasive species but rescuers now pin hopes on a remnant island population.
- C. Marsupials are going extinct due to the colonial era transformation of the ecosystem which also destroyed natural vegetation.
- D. The onslaught of animals, such as cattle, rabbits and housecats, brought in by the British led to the extinction of the western barred bandicoot.

Answer Key: B

MODERATE

Q17. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

Cartographers design and create maps to communicate information about phenomena located somewhere on our planet. In the past, cartographers did not worry too much about who was going to read their maps. Although some simple "usability" research was

done like comparing whether circle or bar symbols worked best cartographers knew how to make maps. This has changed now, however, due to all kinds of societal and technological developments. Today, map readers are more demanding mostly because of the tools they use to read maps. Cartographers, who are also influenced by these trends, are now more interested in seeing if their products are efficient, effective, and appreciated.

- A. Maps are being used for a variety of reasons and therefore map readers have become more demanding.
- B. Today, cartographers also need to look into the usability of maps because of the new technological developments.
- C. New technological developments have prompted cartographers to experiment with their maps by applying these new innovations.
- D. Modern mapmakers evaluate a map's effectiveness, efficiency and satisfaction of the user through a series of experiments.

Answer Key: B

EASY

Q18. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide where (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: The brain isn't organized the way you might set up your home office or bathroom medicine cabinet.

Paragraph: __ (1) __. You can't just put things anywhere you want to. The evolved architecture of the brain is haphazard and disjointed, and incorporates multiple systems, each of which has a mind of its own. __ (2) __ Evolution doesn't design things and it doesn't build systems-it settles on systems that, historically, conveyed a survival benefit. There is no overarching, grand planner engineering the systems so that they work harmoniously together. __ (3) __ The brain is more like a big, old house with piecemeal renovations done on every floor, and less like new construction __ (4) __

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

Answer Key: B

MODERATE

Q19. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

Certain codes may, of course, be so widely distributed in a specific language community or culture, and be learned at so early an age, that they appear not to be constructed the effect of an articulation between sign and referent but to be 'naturally given. Simple visual signs appear to have achieved a 'near-universality' in this sense: though evidence remains that even apparently 'natural' visual codes are culture specific. However, this does not mean that no codes have intervened; rather, that the codes have been profoundly naturalized. The operation of naturalized codes reveals not the transparency and 'naturalness' of language but the depth, the habituation and the near-universality of the codes in use. They produce apparently 'natural' recognitions. This has the (ideological) effect of concealing the practices of coding which are present.

- A. All codes, linguistic and visual, have a natural origin but some are so widespread that they become universal. This is what hides the mechanism of coding behind signs.
- B. Learning linguistic and visual signs at an early age makes all such codes appear natural. This naturalization of codes is the effect of ideology.
- C. Not all codes are natural but certain codes are naturalized and made to appear universal. Ideology aims to hide the mechanism of coding behind signs.
- D. Language and visual signs are codes. However, some of the codes are so widespread that they not only seem naturally given but also hide the mechanism of coding behind the signs.

Answer Key: D

MODERATE

Q20. Five jumbled up sentences (labelled 1, 2, 3, 4 and 5), related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd sentence and key in the number of that sentence as your answer.

1. The UK is a world leader in developing cultivated meat and the approval of a cultivated pet food is an important milestone.

2. If we're to realise the full potential benefits of cultivated meat the government must invest in research and infrastructure.
3. The first UK applications for cultivated meat produced for humans remain under assessment with the Food Standards Agency.
4. The previous UK government had been looking at fast-tracking the approval of cultivated meat for human consumption.
5. It underscores the potential for new innovation to help reduce the negative impacts of intensive animal agriculture.

Answer Key: 1

Argumentative/Persuasive (21-24)

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

In the summer of 2022, subscribers to the US streaming service HBO MAX were alarmed to discover that dozens of the platform's offerings from the Covid-themed heist thriller *Locked Down* to the recent remake of *The Witches* had been quietly removed from the service... The news seemed like vindication to those who had long warned that streaming was more about controlling access to the cultural commons than expanding it, as did reports (since denied by the show's creators) that Netflix had begun editing old episodes of *Stranger Things* to retroactively improve their visual effects.

What's less clear is whether the commonly prescribed cure for these cultural ills, a return to the material pleasures of physical media, is the right one. While the makers of Blu-ray discs claim they have a shelf life of 100 years, such statistics remain largely theoretical until they come to pass, and are dependent on storage conditions, not to mention the continued availability of playback equipment. The humble DVD has already proved far less resilient, with many early releases already beginning to deteriorate in quality. Digital movie purchases provide even less security. Any film "bought" on iTunes could disappear if you move to another territory with a different rights agreement and try to redownload it. It's a bold new frontier in the commodification of art: the birth of the product recall. After a man took to Twitter to bemoan losing access to *Cars 2* after moving from Canada to Australia, Apple clarified that users who downloaded films to their devices would retain permanent access to those downloads, even if they relocated to a hemisphere where the [content was] subject to a different set of rights agreements. Thanks to the company's ironclad digital rights management technology, however, such files cannot be moved or backed up, locking you into watching with your Apple account.

Anyone who does manage to acquire Digital Rights Management free (DRM-free) copies of their favourite films must nonetheless grapple with ever-changing file format standards, not to mention data decay - the gradual process by which electronic information slowly but surely corrupts. Only the regular migration of files from hard drive to hard drive can delay the inevitable, in a sisyphian battle against the ravages of digital time.

In a sense, none of this is new. Charlie Chaplin burned the negative of his 1926 film *A Woman of the Sea* as a tax write-off. Many more films have been lost through accident, negligence or plain indifference. During a heat wave in July 1937, a Fox film vault in New Jersey burned down, destroying a majority of the silent films produced by the studio.

Back then, at least, cinema was defined by its ephemerality: the sense that a film was as good as gone once it left your local cinema. Today, with film studios keen to stress the breadth of their back catalogues (or to put in Hollywood terms, the value of their IPs), audiences may start to wonder why those same studios seem happy to set the vault align themselves if it'll help next quarter's numbers.

HARD

Q21. "Netflix had begun editing old episodes of *Stranger Things* to retroactively improve their visual effects." What is the purpose of this example used in the passage?

- A. To show that art in the digital age, specifically film, is no longer sacrosanct, and may be changed to suit changing tastes or technology.
- B. To show that streaming services are controlling access to the cultural commons rather than expanding it.
- C. To show how unsubstantiated reports are leading to an increase in the level of distrust towards streaming services.
- D. To show a practice that justifies the fears of people who feel streaming services cannot be trusted to be custodians of cultural artefacts like film.

Answer Key: D

MODERATE

Q22. Which one of the following statements, if true, would best invalidate the main argument of the passage?

- A. Improved cloud storage services have made it possible for movie collections to now be preserved in perpetuity, without the need to keep migrating the files.
- B. When moving to a different geographical location, customers can easily use Virtual Private Networks (VPNs) to bypass geo-blocking and regain access to their content on any streaming service.
- C. Recent research has irrefutably proven that Blu-Ray discs have a shelf life of at least 100 years.
- D. Studios and streaming services have committed to giving customers perpetual and platform-independent access to the original digital content they have paid for.

Answer Key: D

MODERATE

Q23. Which one of the following statements about art best captures the arguments made in the passage?

- A. In the age of online subscription services, it is time to change our understanding of classic works of art being primarily immutable and easily available to the public.
- B. Accepting retroactive changes to works of art is dangerous because it will encourage creators to not put enough effort into the original attempt, given that they can always edit or update their work later.
- C. Works of art belong to the cultural commons and hence must remain available in perpetuity, irrespective of who pays for access to them.
- D. As art is increasingly created, stored and distributed digitally, access to it is counter intuitively likely to be made more difficult by the rapid churn in technology and the whims of host platforms.

Answer Key: D

HARD

Q24. Which of the following statements is suggested by the sentence "Back then, at least, cinema was defined by its ephemerality: the sense that a film was as good as gone once it left your local cinema"?

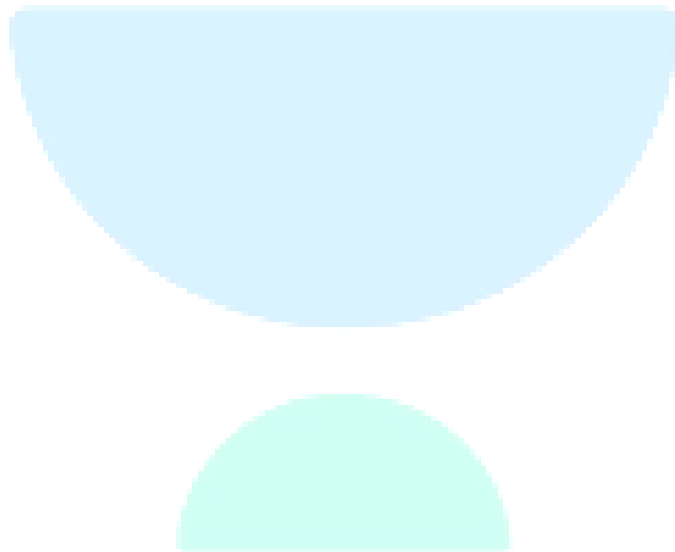
A. Today, films are expected to be available for a long time, since they are no longer tied solely to their stay at the local cinema.

B. Cinema is now no longer as ephemeral as it used to be earlier, because the technology used for creating and preserving films has improved manifold.

C. Presently, there is no reason why film studios should remove access to films once they have left the local cinema.

D. Around a century ago, people were more accepting of not having access to films once they left the local cinema.

Answer Key: A



CAT 2024 Slot 1

QUANT

Topic: Modern Mathematics

Subtopic: Functions (Onto / Surjective Functions)

Question Type: Concept-Based

Level of Difficulty: Difficult

Q1. Consider two sets $A = \{2, 3, 5, 7, 11, 13\}$ and $B = \{1, 8, 27\}$ Let f be a function from A to B such. that for every element D in B , there is at least one element a in A such that $f(a) = b$ Then, the total number of such functions f is

- A. 667
- B. 540
- C. 537
- D. 665

Answer Key: B

Topic: Algebra

Subtopic: Quadratic Expressions and Substitution

Question Type: Concept-Based

Level of Difficulty: Moderate

Q2. Let $x, y,$ and z be real numbers satisfying

$$4(x^2 + y^2 + z^2) = a$$

$$4(x - y - z) = 3 + a$$

Then a equals

- A. $4/3$
- B. 3
- C. 1
- D. 4

Answer Key: B

Topic: Algebra

Subtopic: Quadratic Equations (Common Root Concept)

Question Type: Numerical Based

Level of Difficulty: Moderate

Q3. If the equations $x^2 + mx + 9 = 0$, $x^2 + nx + 17 = 0$ and $x^2 + (m + n)x + 35 = 0$ have a common negative root, then the value of $(2m + 3n)$ is (TITA)

Answer Key: 38

Topic: Algebra

Subtopic: Arithmetic Progression with Constraints

Question Type: Numerical Based

Level of Difficulty: Moderate

Q4. Suppose $X_1, X_2, X_3, \dots, X_{100}$ are in arithmetic progression such that $x_5 = -4$ and $2x_6, 2x_9 = x_{11} + x_{13}$. Then, X_{100} equals.

- A. 204
- B. -194
- C. 206
- D. -196

Answer key: B

Topic: Arithmetic

Subtopic: Time and Work (Work Rate and Working Hours)

Question Type: Numerical Based

Level of Difficulty: Moderate

Q5. Renu would take 15 days working 4 hours per day to complete a certain task whereas Seema would take 8 days working 5 hours per day to complete the same task. They decide to work together to complete this task. Seema agrees to work for double the number of hours per day as Renu, while Renu agrees to work for double the number of days as Seema. If Renu works 2 hours per day, then the number of days Seema will work, is (TITA)

Answer Key: 6

Topic: Number System

Subtopic: Remainders and Modular Arithmetic

Question Type: Concept-Based

Level of Difficulty: Easy

Q6. When 10^{100} is divided by 7, the remainder is

- A. 6
- B. 1
- C. 4
- D. 3

Answer Key: C

Topic: Algebra

Subtopic: Exponents and Equation Transformation

Question Type: Concept-Based

Level of Difficulty: Difficult

Q7. The sum of all real values of k for which $\left(\frac{1}{8}\right)^k \times \left(\frac{1}{32768}\right)^{\frac{1}{3}} = \left(\frac{1}{8}\right) \times \left(\frac{1}{32768}\right)^{\frac{1}{k}}$ is

- A. $-\frac{4}{3}$
- B. $-\frac{2}{3}$
- C. $\frac{4}{3}$
- D. $\frac{2}{3}$

Answer Key: B

Topic: Number System

Subtopic: Greatest Integer Function (Floor Function)

Question Type: Numerical Based

Level of Difficulty: Moderate

Q8. For any natural number n, let a_n be the largest integer not exceeding \sqrt{n} . Then the value of $a_1 + a_2 + a_3 + \dots + a_{50}$ is (TITA)

Answer key : 217

Topic: Arithmetic

Subtopic: Percentages and Weighted Contributions

Question Type: Numerical Based

Level of Difficulty: Moderate

Q9. In September, the incomes of Kamal, Amal and Vimal are in the ratio 8 : 6 : 5. They rent a house together, and Kamal pays 15%, Amal pays 12% and Vimal pays 18% of their respective incomes to cover the total house rent in that month. In October, the house rent remained unchanged while their incomes increased by 10%, 12% and 15%, respectively. In October, the percentage of their total income that will be paid as house rent, is nearest to

- A. 13.26
- B. 14.84
- C. 12.75
- D. 15.181

Answer Key: A

Topic: Modern Mathematics

Subtopic: Permutations of Digits and Digit Sum Properties

Question Type: Numerical Based

Level of Difficulty: Difficult

Q10. The sum of all four-digit numbers that can be formed with the distinct non-zero digits $a, b, c,$ and $d,$ with each digit appearing exactly once in every number, is $153310 + n,$ where n is a single digit natural number. Then, the value of $(a+b+c+d+n)$ is? (TITA)

Answer Key: 31

Topic: Geometry

Subtopic: Trapezium Geometry and Similar Triangles

Question Type: Concept Based

Level of Difficulty: Difficult

Q11. ABCD is a trapezium in which AB is parallel to CD. The sides AD and BC when extended, intersect at point E. If $AB = 2$ cm, $CD = 1$ cm, and the perimeter of ABCD is 6 cm, then the perimeter, in cm, of $\triangle AEB$ is

- A. 8
- B. 10
- C. 9

D. 7

Answer Key: A

Topic: Geometry

Subtopic: Trapezium Geometry and Similar Triangles

Question Type: Concept-Based

Level of Difficulty: Difficult

Q12. In the XY-plane, the area, in sq. units, of the region defined by the inequalities $y \geq x + 4$ and $-4 \leq x^2 + y^2 + 4(x - y) \leq 0$

A. 3π

B. 2π

C. π

D. 4π

Answer key: B

Topic: Algebra

Subtopic: Logarithms (Change of Base and Simplification)

Question Type: Numerical Based

Level of Difficulty: Moderate

Q13. If x is a positive real number such that $4 \log_{10}x + 4 \log_{100}x + 8 \log_{1000}x = 13$ then greatest integer not exceeding x , is (TITA)

Answer key: 31

Topic: Arithmetic

Subtopic: Profit and Loss (Cost Change and Profit Change)

Question Type: Numerical Based

Level of Difficulty: Moderate

Q14. The selling price of a product is fixed to ensure 40% profit. If the product had cost 40% less and had been sold for 5 rupees less, then the resulting profit would have been 50%. The original selling price, in rupees, of the product is

A. 10

B. 15

C. 20

D. 14

Answer Key: D

Topic: Arithmetic

Subtopic: Mixtures and Replacement

Question Type: Concept-Based

Level of Difficulty: Easy

Q15. A glass is filled with milk. Two-thirds of its content is poured out and replaced with water. If this process of pouring out two-thirds the content and replacing with water is repeated three more times, then the final ratio of milk to water in the glass, is

A. 1:26

B. 1:80

C. 1:27

D. 1:81



Answer Key: B

Topic: Arithmetic

Subtopic: Ratio and Linear Equations

Question Type: Numerical Based

Level of Difficulty: Moderate

Q16. A fruit seller has a total of 187 fruits consisting of apples, mangoes and oranges. The number of apples and mangoes are in the ratio 5: 2. After she sells 75 apples, 26 mangoes and half of the oranges, the ratio of the number of unsold apples to the number of unsold oranges becomes 3: 2. The total number of unsold fruits is (TITA)



Answer Key: 66

Topic: Arithmetic

Subtopic: Time, Speed and Distance (Relative Motion)

Question Type: Numerical Based

Level of Difficulty: Moderate

Q17. Two places A and B are 45 kms apart and connected by a straight road. Anil

goes from A to B while Sunil goes from B to A. Starting at the same time, they cross each other in exactly 1 hour 30 minutes. If Anil reaches B exactly 1 hour 15 minutes after Sunil reaches A, the speed of Anil, in km per hour, is

- A. 14
- B. 12
- C. 16
- D. 18

Answer key : B

Topic: Arithmetic

Subtopic: Averages and Number Formation

Question Type: Numerical Based

Level of Difficulty: Easy

Q18. There are four numbers such that average of first two numbers is 1 more than the first number, average of first three numbers is 2 more than average of first two numbers, and average of first four numbers is 3 more than average of first three numbers. Then, the difference between the largest and the smallest numbers, is (TITA)

Answer Key: 15

Topic: Arithmetic

Subtopic: Simple Interest (Multi-stage Investment)

Question Type: Numerical Based

Level of Difficulty: Easy

Q19. An amount of Rs 10000 is deposited in bank A for a certain number of years at a simple interest of 5% per annum. On maturity, the total amount received is deposited in bank B for another 5 years at a simple interest of 6% per annum. If the interests received from bank A and bank B are in the ratio 10 : 13, then the investment period, in years, in bank A is

- A. 4
- B. 6
- C. 3
- D. 5

Answer key : B

Topic: Arithmetic

Subtopic: Successive Reduction / Reverse Calculation

Question Type: Numerical Based

Level of Difficulty: Easy

Q20. A shop wants to sell a certain quantity (in kg) of grains. It sells half the quantity and an additional 3 kg of these grains to the first customer. Then, it sells half of the remaining quantity and an additional 3 kg of these grains to the second customer. Finally, when the shop sells half of the remaining quantity and an additional 3 kg of these grains to the third customer, there are no grains left. The initial quantity, in kg, of grains is

- A. 42
- B. 18
- C. 36
- D. 50

Answer Key: A

Topic: Algebra

Subtopic: Surds and Simplification

Question Type: Concept-Based

Level of Difficulty: Moderate

Q21. If $(a + b\sqrt{n})$ is the positive square root of $(29 - 12\sqrt{5})$ where a and b are integers, and n is a natural number, then the maximum possible value of $(a + b + n)$ is

- A. 4
- B. 18
- C. 6
- D. 12

Answer Key: B

Topic: Geometry

Subtopic: 3D Geometry (Rectangular Box in Sphere)

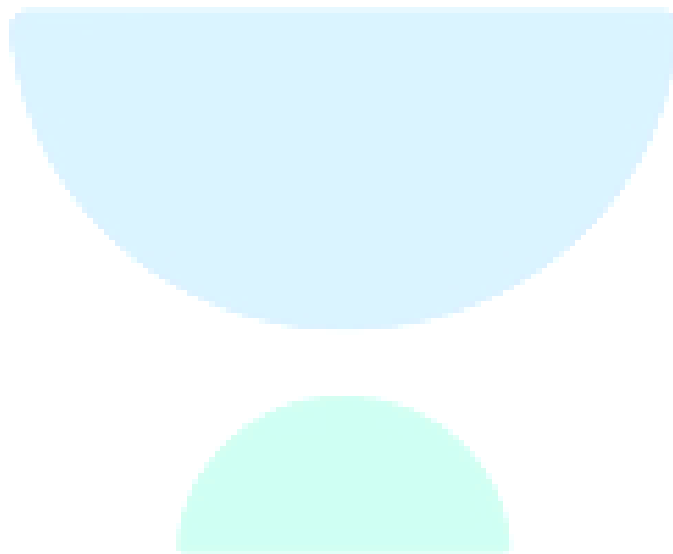
Question Type: Numerical Based

Level of Difficulty: Difficult

Q22. The surface area of a closed rectangular box, which is inscribed in a sphere, is 846 sq cm, and the sum of the lengths of all its edges is 144 cm. The volume, in cubic cm, of the sphere is

- A. $1125 \pi \sqrt{2}$
- B. $750 \pi \sqrt{2}$
- C. 1125π
- D. 750π

Answer Key: A

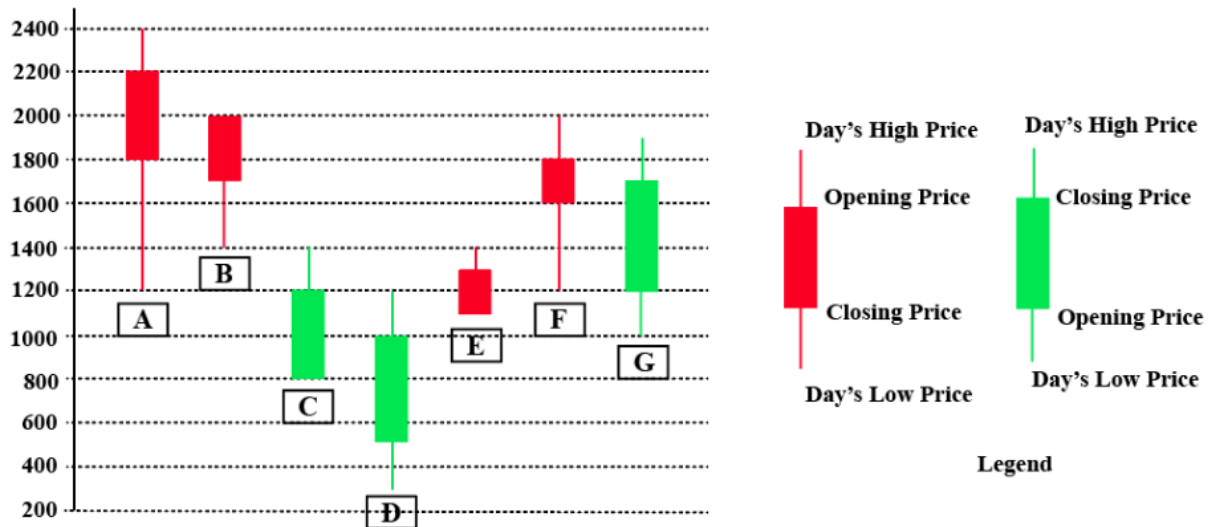


CAT 2024 Slot 1

LRDI

SET 1. Read the information given below and answer the question that follows:

The chart below shows the price data for seven shares A,B,C,D,E,F, and G as a candlestick plot for a particular day. The vertical axis shows the price of the share in rupees. A share whose closing price (price at the end of the day) is more than its opening price (price at the start of the day) is called a bullish share; otherwise, it is called a bearish share. All bullish and bearish shares are shown in green and red colour respectively.



Q1. Daily Share Price Variability (SPV) is defined as (Day's high price - Day's low price) / (Average of the opening and closing prices during the day). Which among the shares A, C, D and F had the highest SPV on that day?

- A. A
- B. C
- C. F
- D. D

Ans: D

Q2. Daily Share Price Variability (SPV) is defined as (Day's high price - Day's low price) / (Average of the opening and closing prices during the day). How many shares had an SPV greater than 0.5 on that day? (TITA)

Answer: 4

Q3. Daily loss for a share is defined as (Opening price - Closing price) / (Opening price). Which among the shares A, B, F and G had the highest daily loss on that day?

- A. G
- B. F
- C. A
- D. B

Answer: C

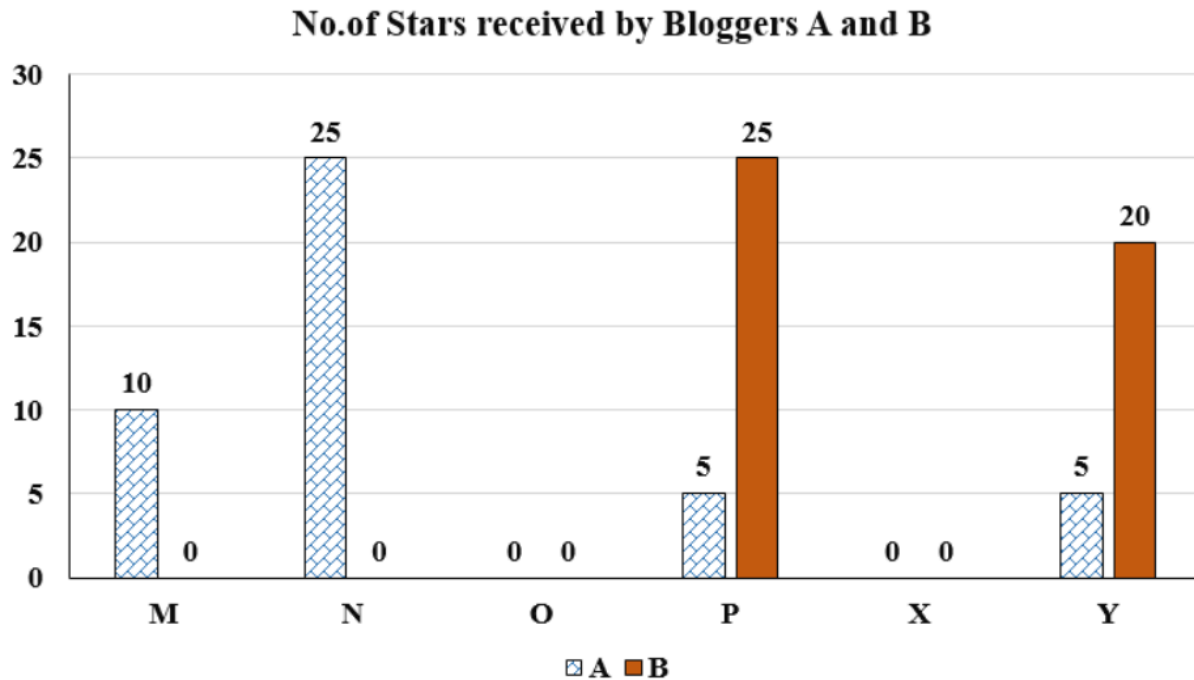
Q4. What would have been the percentage wealth gain for a trader, who bought equal numbers of all bullish shares at opening price and sold them at their day's high?

- A. 50%
- B. 100%
- C. 72%
- D. 80%

Answer: D

SET 2. Read the information given below and answer the question that follows:

Six web surfers M, N, O, P, X, and Y each had 30 stars which they distributed among four bloggers A, B, C, and D. The number of stars received by A and B from the six web surfers is shown in the figure below.



The following additional facts are known regarding the number of stars received by the bloggers from the surfers.

1. The numbers of stars received by the bloggers from the surfers were all multiples of 5 (including 0).
2. The total numbers of stars received by the bloggers were the same.
3. Each blogger received a different number of stars from M.
4. Two surfers gave all their stars to a single blogger.
5. D received more stars than C from Y.

Q5. What was the total number of stars received by D? (TITA)

Answer: 45

Q6. What was the number of stars received by D from Y?

- A. 5
- B. Cannot be determined
- C. 0
- D. 10

Answer: A

Q7. How many surfers distributed their stars among exactly 2 bloggers? (TITA)

Answer: 2

Q8. Which of the following can be determined with certainty?

- I. The number of stars received by C from M
- II. The number of stars received by D from O

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

Answer. B

SET 3. Read the information given below and answer the question that follows:

The game of QUIET is played between two teams. Six teams, numbered 1, 2, 3, 4, 5, and 6, play in a QUIET tournament. These teams are divided equally into two groups. In the tournament, each team plays every other team in the same group only once, and each team in the other group exactly twice. The tournament has several rounds, each of which consists of a few games. Every team plays exactly one game in each round. The following additional facts are known about the schedule of games in the tournament.

1. Each team played against a team from the other group in Round 8.
2. In Round 4 and Round 7, the match-ups, that is the pair of teams playing against each other, were identical. In Round 5 and Round 8, the match-ups were identical.
3. Team 4 played Team 6 in both Round 1 and Round 2.
4. Team 1 played Team 5 ONLY once and that was in Round 2.
5. Team 3 played Team 4 in Round 3. Team 1 played Team 6 in Round 6. 6. In Round 8, Team 3 played Team 6, while Team 2 played Team 5.

Q9. How many rounds were there in the tournament? (TITA)

Answer: 8

Q10. What is the number of the team that played Team 1 in Round 5? (TITA)

Answer: 4

Q11. Which team among the teams numbered 2, 3, 4, and 5 was not part of the same group?

- A. 4
- B. 5
- C. 3
- D. 2

Answer: B

Q12.What is the number of the team that played Team 1 in Round 7? (TITA)

Answer: 3

Q13.What is the number of the team that played Team 6 in Round 3? (TITA)

Answer: 5

SET 4. Read the information given below and answer the question that follows:

Two students, Amiya and Ramya are the only candidates in an election for the position of class representative. Students will vote based on the intensity level of Amiya's and Ramya's campaigns and the type of campaigns they run. Each campaign is said to have a level of 1 if it is a staid campaign and a level of 2 if it is a vigorous campaign. Campaigns can be of two types, they can either focus on issues, or on attacking the other candidate.

If Amiya and Ramya both run campaigns focusing on issues, then

- The percentage of students voting in the election will be 20 times the sum of the levels of campaigning of the two students. For example, if Amiya and Ramya both run vigorous campaigns, then $20 \times (2+2)\%$, that is, 80% of the students will vote in the election.
- Among voting students, the percentage of votes for each candidate will be proportional to the levels of their campaigns. For example, if Amiya runs a staid (i.e., level 1) campaign while Ramya runs a vigorous (i.e., level 2) campaign, then Amiya will receive $1/3$ of the votes cast, and Ramya will receive the other $2/3$.

The above-mentioned percentages change as follows if at least one of them runs a campaign attacking their opponent.

- If Amiya runs a campaign attacking Ramya and Ramya runs a campaign focusing on issues, then 10% of the students who would have otherwise voted for Amiya will vote for Ramya, and another 10% who would have otherwise voted for Amiya, will not vote at all.
- If Ramya runs a campaign attacking Amiya and Amiya runs a campaign focusing on issues, then 20% of the students who would have otherwise voted for Ramya will vote for Amiya, and another 5% who would have otherwise voted for Ramya, will not vote at all.
- If both run campaigns attacking each other, then 10% of the students who would have otherwise voted for them had they run campaigns focusing on issues, will not vote at all.

Q14. If both of them run staid campaigns attacking the other, then what percentage of students will vote in the election?

- A. 60%
- B. 64%
- C. 40%
- D. 36%

Answer: D

Q15. What is the minimum percentage of students who will vote in the election?

- A. 38%
- B. 36%
- C. 40%
- D. 32%

Answer: B

Q16. If Amiya runs a campaign focusing on issues, then what is the maximum percentage of votes that she can get?

- A. 40%
- B. 36%
- C. 48%
- D. 44%

Answer: C

Q17. If Ramya runs a campaign attacking Amiya, then what is the minimum percentage of votes that she is guaranteed to get?

- A. 30%
- B. 15%
- C. 18%
- D. 12%

Answer: B

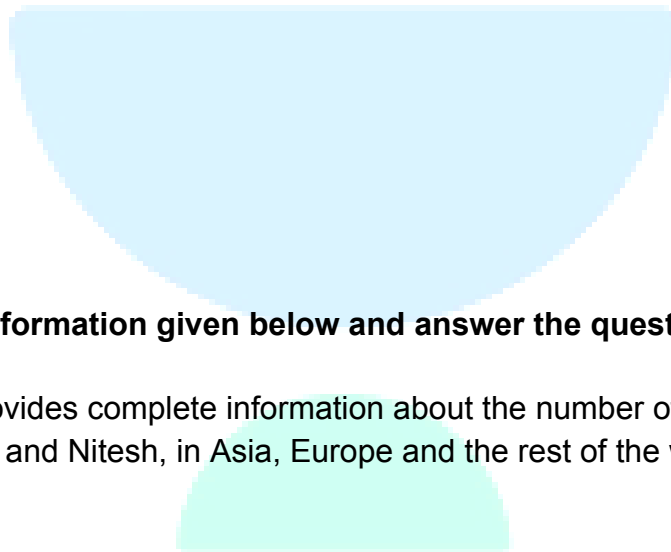
Q18. What is the maximum possible voting margin with which one of the candidates can win

- A. 20%
- B. 28%
- C. 26%
- D. 29%

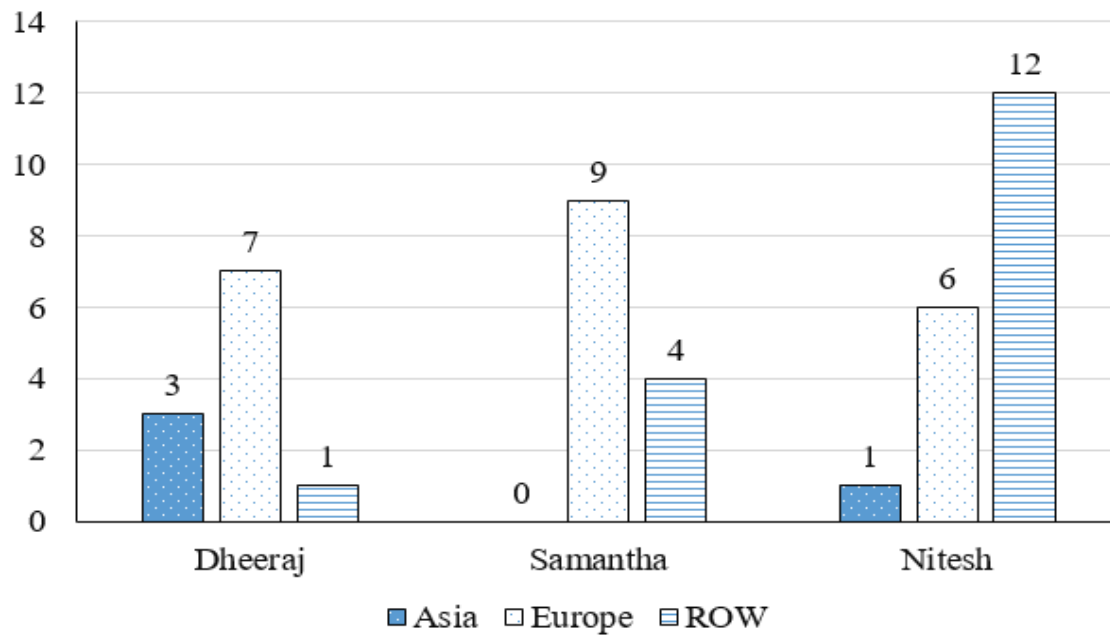
Answer: D

SET 5. Read the information given below and answer the question that follows:

The chart below provides complete information about the number of countries visited by Dheeraj, Samantha and Nitesh, in Asia, Europe and the rest of the world (ROW).



Number of countries visited



The following additional facts are known about the countries visited by them.

1. 32 countries were visited by at least one of them.
2. USA (in ROW) is the only country that was visited by all three of them.
3. China (in Asia) is the only country that was visited by both Dheeraj and Nitesh, but not by Samantha.
4. France (in Europe) is the only country outside Asia, which was visited by both Dheeraj and Samantha, but not by Nitesh.
5. Half of the countries visited by both Samantha and Nitesh are in Europe.

Q19. How many countries in Asia were visited by at least one of Dheeraj, Samantha and Nitesh? (TITA)

Answer: 3

Q20. How many countries in Europe were visited only by Nitesh? (TITA)

Answer: 2

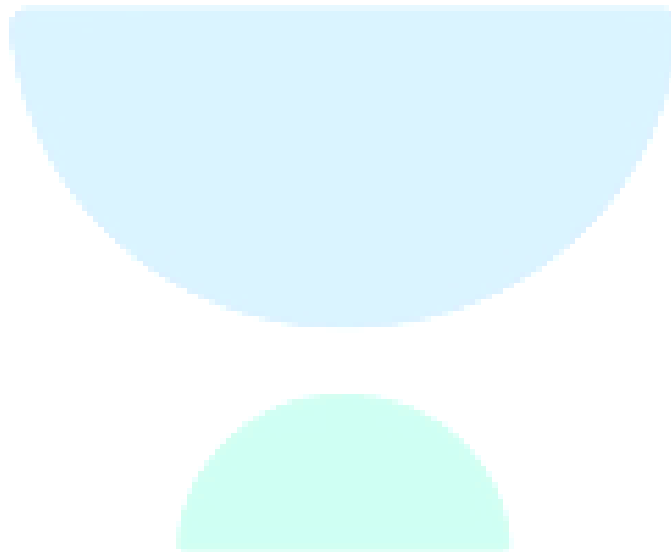
Q21. How many countries in the ROW were visited by both Nitesh and Samantha? (TITA)

Answer: 4

Q22. How many countries in Europe were visited by exactly one of Dheeraj, Samantha and Nitesh?

- A. 12
- B. 14
- C. 10
- D. 5

Answer: A



CAT 2024 Slot 2

VARC

MODERATE

Q1. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

Recent important scientific findings have emerged from crossing the boundaries of scientific fields. They stem from physicists collaborating with biologists, sociologists and others, to answer questions about our world. But physicists and their potential collaborators often find their cultures out of sync. For one, physicists often discard a lot of information while extracting broad patterns; for other scientists, information is not readily disposed. Further, many non-physicists are uncomfortable with mathematical models. Still, the desire to work on something new and different is real, and there are clear benefits from the collision of views.

- A. Physicists have successfully buried their differences on research methods applied in other fields in their desire to find answers to baffling scientific questions.
- B. Large data sets and mathematical models in physics research combined with the research methods of non-physicist collaborators have yielded important scientific findings.
- C. The desire to diversify their research and answer important questions has led to several collaborations between physicists and other social scientists.
- D. Despite differences in their research styles, physicists' research collaborations with scholars from other disciplines have yielded important research findings.

Answer Key: D

Argumentative/Persuasive (2-5)

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

The job of a peer reviewer is thankless. Collectively, academics spend around 70 million hours every year evaluating each other's manuscripts on the behalf of scholarly journals — and they usually receive no monetary compensation and little if any recognition for their effort. Some do it as a way to keep abreast with developments in their field; some

simply see it as a duty to the discipline. Either way, academic publishing would likely crumble without them.

In recent years, some scientists have begun posting their reviews online, mainly to claim credit for their work. Sites like Publons allow researchers to either share entire referee reports or simply list the journals for whom they've carried out a review.... The rise of Publons suggests that academics are increasingly placing value on the work of peer review and asking others, such as grant funders, to do the same. While that's vital in the publish-or-perish culture of academia, there's also immense value in the data underlying peer review. Sharing peer review data could help journals stamp out fraud, inefficiency, and systemic bias in academic publishing.....

Peer review data could also help root out bias. Last year, a study based on peer review data for nearly 24,000 submissions to the biomedical journal eLife found that women and non-Westerners were vastly underrepresented among peer reviewers. Only around one in every five reviewers was female, and less than two percent of reviewers were based in developing countries.... Openly publishing peer review data could perhaps also help journals address another problem in academic publishing: fraudulent peer reviews. For instance, a minority of authors have been known to use phony email addresses to pose as an outside expert and review their own manuscripts....

Opponents of open peer review commonly argue that confidentiality is vital to the integrity of the review process; referees may be less critical of manuscripts if their reports are published, especially if they are revealing their identities by signing them. Some also hold concerns that open reviewing may deter referees from agreeing to judge manuscripts in the first place, or that they'll take longer to do so out of fear of scrutiny....

Even when the content of reviews and the identity of reviewers can't be shared publicly, perhaps journals could share the data with outside researchers for study. Or they could release other figures that wouldn't compromise the anonymity of reviews but that might answer important questions about how long the reviewing process takes, how many researchers editors have to reach out to on average to find one who will carry out the work, and the geographic distribution of peer reviewers.

Of course, opening up data underlying the reviewing process will not fix peer review entirely, and there may be instances in which there are valid reasons to keep the content of peer reviews hidden and the identity of the referees confidential. But the norm should shift from opacity in all cases to opacity only when necessary.

MODERATE

Q2. Based on the passage we can infer that the author would most probably support

- A. publicising peer review data rather than the publication of actual reviews.
- B. preserving the anonymity of reviewers to protect them from criticism.
- C. more careful screening to ensure the recruitment of content-familiar peer reviewers.
- D. greater transparency across the peer review process in academic publishing.

Answer Key: D

MODERATE

Q3. According to the passage, which of the following is the only reason NOT given in favour of making peer review data public?

- A. It can tackle the problem of selecting appropriately qualified reviewers for academic writing.
- B. It would highlight the gender and race biases currently existing in the selection of reviewers.
- C. It will deal with peer review fraud such as authors publishing bogus reviews of their work.
- D. It could address various inefficiencies and fraudulent practices that continue in academic publishing process.

Answer Key: A

MODERATE

Q4. According to the passage, some are opposed to making peer reviews public for all the following reasons EXCEPT that it

- A. delays the manuscript evaluation process as reviewers would take longer to write their reviews.
- B. makes reviewers reluctant to review manuscripts, especially if these are critical of the submitted work.
- C. leaves the reviewers unexposed to unwarranted and unjustified criticism or comments from others.

D. deters reviewers from producing honest, if critical, reviews that are vital to the sound publishing process.

Answer Key: C

MODERATE

Q5. All of the following are listed as reasons why academics choose to review other scholars' work EXCEPT:

- A. It is seen as a form of service to the academic community.
- B. It helps them keep current with cutting-edge ideas in their academic disciplines.
- C. It is seen as an opportunity to expand their influence in the academic community.
- D. Some use this as an opportunity to publicise their own review work.

Answer Key: C

MODERATE

Q6. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide where (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: Science has officially crowned us superior to our early-rising brethren.

Paragraph: My fellow night owls, grab a strong cup of coffee and gather around: I have great news. ___(1)__. For a long time, our kind has been unfairly maligned. Stereotyped as lazy and undisciplined. Told we ought to be morning larks. Advised to go to bed early so we can wake before 5am and run a marathon before breakfast like all high-flyers seem to do. Now, however, we are having the last laugh. ___(2)__. It may be a tad more complicated than that. A study published last week, which you may have already seen while scrolling at 1am, suggests that staying up late could be good for brain power. ___(3)__. Is this study a thinly veiled PR exercise conducted by a caffeine-pill company? Nope, it's legit. ___(4)__. Research led by academics at Imperial College London studied data on more than 26,000 people and found that "self-declared 'night owls' generally tend to have higher cognitive scores".

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

Answer Key: C

HARD

Q7. Five jumbled up sentences (labelled 1, 2, 3, 4 and 5), related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd sentence and key in the number of that sentence as your answer.

1. The UK is a world leader in developing cultivated meat and the approval of a cultivated pet food is an important milestone.
2. If we're to realise the full potential benefits of cultivated meat the government must invest in research and infrastructure.
3. The first UK applications for cultivated meat produced for humans remain under assessment with the Food Standards Agency.
4. The previous UK government had been looking at fast-tracking the approval of cultivated meat for human consumption.
5. It underscores the potential for new innovation to help reduce the negative impacts of intensive animal agriculture.

Answer Key: 4

Analytical (8-11)

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

[S]pices were a global commodity centuries before European voyages. There was a complex chain of relations, yet consumers had little knowledge of producers and vice versa. Desire for spices helped fuel European colonial empires to create political, military and commercial networks under a single power.

Historians know a fair amount about the supply of spices in Europe during the medieval period – the origins, methods of transportation, the prices – but less about demand. Why go to such extraordinary efforts to procure expensive products from exotic lands? Still, demand was great enough to inspire the voyages of Christopher Columbus and Vasco Da Gama, launching the first fateful wave of European colonialism. . . .

So, why were spices so highly prized in Europe in the centuries from about 1000 to 1500? One widely disseminated explanation for medieval demand for spices was that

they covered the taste of spoiled meat. . . . Medieval purchasers consumed meat much fresher than what the average city-dweller in the developed world of today has at hand. However, refrigeration was not available, and some hot spices have been shown to serve as an anti-bacterial agent. Salting, smoking or drying meat were other means of preservation. Most spices used in cooking began as medical ingredients, and throughout the Middle Ages spices were used as both medicines and condiments. Above all, medieval recipes involve the combination of medical and culinary lore in order to balance food's humeral properties and prevent disease. Most spices were hot and dry and so appropriate in sauces to counteract the moist and wet properties supposedly possessed by most meat and fish. . . .

Where spices came from was known in a vague sense centuries before the voyages of Columbus. Just how vague may be judged by looking at medieval world maps . . . To the medieval European imagination, the East was exotic and alluring. Medieval maps often placed India close to the so-called Earthly Paradise, the Garden of Eden described in the Bible.

Geographical knowledge has a lot to do with the perceptions of spices' relative scarcity and the reasons for their high prices. An example of the varying notions of scarcity is the conflicting information about how pepper is harvested. As far back as the 7th century Europeans thought that pepper in India grew on trees "guarded" by serpents that would bite and poison anyone who attempted to gather the fruit. The only way to harvest pepper was to burn the trees, which would drive the snakes underground. Of course, this bit of lore would explain the shriveled black peppercorns, but not white, pink or other colors.

Spices never had the enduring allure or power of gold and silver or the commercial potential of new products such as tobacco, indigo or sugar. But the taste for spices did continue for a while beyond the Middle Ages. As late as the 17th century, the English and the Dutch were struggling for control of the Spice Islands: Dutch New Amsterdam, or New York, was exchanged by the British for one of the Moluccan Islands where nutmeg was grown.

MODERATE

Q8. In the context of the passage, which one of the following conclusions CANNOT be reached?

- A. India was colonised for its spices and gold.
- B. Tobacco was more marketable than spices.

- C. The spice trade was a driver of colonial expansion.
- D. Colonialism was motivated by the demand for spices

Answer Key: A

MODERATE

Q9. It can be inferred that all of the following contributed to a decline in the allure of spices, EXCEPT:

- A. changes in European cuisine.
- B. the development of refrigeration techniques.
- C. increase in the availability of spices.
- D. changes in the system of medical treatment.

Answer Key: C

MODERATE

Q10. If a trader brought white peppercorns from India to medieval Europe, all of the following are unlikely to happen, EXCEPT:

- A. Europeans would doubt the story of pepper harvesting.
- B. the price of spices would decrease.
- C. medieval maps would be used as navigational aids.
- D. pepper would no longer be considered exotic.

Answer Key: A

MODERATE

Q11. In the context of the passage, the people who heard the story of pepper trees being guarded by snakes would be least likely to arrive at the conclusion that

- A. it is no surprise that the pepper supply is so limited.
- B. it is not advisable to go to India to harvest the pepper themselves.
- C. this is why pepper is so hot.
- D. pepper is costly for good reason.

Answer Key: C

Analytical (12-15)

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

The history of any major technological or industrial advance is inevitably shadowed by a less predictable history of unintended consequences and secondary effects — what economists sometimes call "externalities." Sometimes those consequences are innocuous ones, or even beneficial. Gutenberg invents the printing press, and literacy rates rise, which causes a significant part of the reading public to require spectacles for the first time, which creates a surge of investment in lens-making across Europe, which leads to the invention of the telescope and the microscope.

Oftentimes the secondary effects seem to belong to an entirely different sphere of society. When Willis Carrier hit upon the idea of air-conditioning, the technology was primarily intended for industrial use: ensuring cool, dry air for factories that required low-humidity environments. But...it touched off one of the largest migrations in the history of the United States, enabling the rise of metropolitan areas like Phoenix and Las Vegas that barely existed when Carrier first started tinkering with the idea in the early 1900s.

Sometimes the unintended consequence comes about when consumers use an invention in a surprising way. Edison famously thought his phonograph, which he sometimes called "the talking machine," would primarily be used to take dictation....But then later innovators... discovered a much larger audience willing to pay for musical recordings made on descendants of Edison's original invention. In other cases, the original innovation comes into the world disguised as a plaything...the way the animatronic dolls of the mid-1700s inspired Jacquard to invent the first "programmable" loom and Charles Babbage to invent the first machine that fit the modern definition of a computer, setting the stage for the revolution in programmable technology that would transform the 21st century in countless ways.

We live under the gathering storm of modern history's most momentous unintended consequence....carbon-based climate change. Imagine the vast sweep of inventors whose ideas started the Industrial Revolution, all the entrepreneurs and scientists and hobbyists who had a hand in bringing it about. Line up a thousand of them and ask them all what they had been hoping to do with their work. Not one would say that their intent had been to deposit enough carbon in the atmosphere to create a greenhouse effect that trapped heat at the surface of the planet. And yet here we are.

Ethyl (leaded fuel) and Freon belonged to the same general class of secondary effect: innovations whose unintended consequences stem from some kind of waste by-product that they emit. But the potential health threats of Ethyl (unleaded fuel) were visible in the 1920s, unlike, say, the long-term effects of atmospheric carbon build up in the early days of the Industrial Revolution....

Indeed, it is reasonable to see CFCs (chlorofluorocarbons) as a forerunner of the kind of threat we will most likely face in the coming decades, as it becomes increasingly possible for individuals or small groups to create new scientific advances — through chemistry or biotechnology or materials science — setting off unintended consequences that reverberate on a global scale.

HARD

Q12. We can assume that the author would support all of the following views EXCEPT:

- A. It has become far easier for people today to bring out innovations with dire worldwide consequences than it was earlier.
- B. The emissions caused by the large-scale use of leaded fuel ought to have been addressed earlier than they were.
- C. While technological advances in the past have had innocuous or beneficial outcomes, more recent advances have the potential to be more threatening globally.
- D. The by-products of leaded fuel, rather than the fuel itself, were responsible for the build-up of carbon-related gases in the atmosphere.

Answer Key: C

HARD

Q13. Carrier, Babbage, and Edison are mentioned in the passage to illustrate the author's point that

- A. these inventors could not have visualised the eventual impact of their inventions on society.
- B. the secondary effect of past inventions mostly resulted in the creation of new inventions.

C. inventions typically end up being used for entirely different purposes than the intended ones.

D. despite the original intention, the unintended consequences of their inventions were largely beneficial.

Answer Key: A

MODERATE

Q14. Which of the following best conveys the main point of the first paragraph?

A. The secondary effects of most major technological advances in the past, especially if they were unintended, have turned out to be beneficial.

B. The full impact of technological advances cannot be estimated in the short run as the ripple effects often extend far beyond the original intent.

C. The entire impact of a technological advance should be evaluated by the boost its secondary effects gives to generating further technological advances.

D. It is important to judge an invention not by its immediate outcomes, but by the holistic impact of its secondary effects.

Answer Key: B

MODERATE

Q15. The author lists all of the following examples as "externalities" of major technical advances EXCEPT:

A. extension of the phonograph to large-scale recording of music

B. build-up of chlorofluorocarbons in the atmosphere

C. cooling and de-humidifying of factories through air-conditioning

D. application of the Jacquard loom to modern IT programming

Answer Key: C

MODERATE

Q16. Five jumbled up sentences (labelled 1, 2, 3, 4 and 5), related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd sentence and key in the number of that sentence as your answer.

1. No known real researcher of human behaviour would say that gender is all nature or all nurture.
2. The evidence for a biological basis for gender certainly doesn't mean we should be complacent in the face of sexism.
3. Many people are uncomfortable with the idea that gender is not purely a social construct.
4. Despite this empirical truth, researchers who study the biological basis of gender often face political pushback.
5. There's a political preference for gender to be only a reflection of social factors and so entirely malleable.

Answer Key: 2

MODERATE

Q17. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide where (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: Yet each day the flock produced eggs with calcareous shells though they apparently had not ingested any calcium from land which was entirely lacking in limestone.

Paragraph: Early in this century a young Breton schoolboy who preparing himself for a scientific career began to notice a strange fact about hens in his father's poultry yard. ____ (1) ____ . As they scratched the soil they constantly seemed to be pecking at specks of mica, a siliceous material dotting the ground. ____ (2) ____ . No one could explain to Louis Kervran why the chickens selected the mica, or why each time a bird was killed for the family cooking pot no trace of the mica could be found in its gizzard. ____ (3) ____ . It took Kervran many years to establish that the chickens were transmuting one element into another. ____ (4) ____ .

- A. Option 3
- B. Option 4
- C. Option 1

D. Option 2

Answer Key: A

Analytical (18-21)

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

(. . .) There are three other common drivers for carnivore-human attacks, some of which are more preventable than others. Natural aggression-based conflicts – such as those involving females protecting their young or animals protecting a food source – can often be avoided as long as people stay away from those animals and their food.

Carnivores that recognise humans as a means to get food, are a different story. As they become more reliant on human food they might find at campsites or in rubbish bins, they become less avoidant of humans. Losing that instinctive fear response puts them into more situations where they could get into an altercation with a human, which often results in that bear being put down by humans. "A fed bear is a dead bear," says Servheen, referring to a common saying among biologists and conservationists.

Predatory or predation-related attacks are quite rare, only accounting for 17% of attacks in North America since 1955. They occur when a carnivore views a human as prey and hunts it like it would any other animal it uses for food. (. . .)

Then there are animal attacks provoked by people taking pictures with them or feeding them in natural settings such as national parks which often end with animals being euthanised out of precaution. "Eventually, that animal becomes habituated to people, and [then] bad things happen to the animal. And the folks who initially wanted to make that connection don't necessarily realise that," says Christine Wilkinson, a postdoctoral researcher at UC Berkeley, California, who's been studying coyote-human conflicts.

After conducting countless postmortems on all types of carnivore-human attacks spanning 75 years, Penteriani's team believes 50% could have been avoided if humans reacted differently. A 2017 study co-authored by Penteriani found that engaging in risky behaviour around large carnivores increases the likelihood of an attack.

Two of the most common risky behaviours are parents leaving their children to play outside unattended and walking an unleashed dog, according to the study. Wilkinson says 66% of coyote attacks involve a dog. "[People] end up in a situation where their dog is being chased, or their dog chases a coyote, or maybe they're walking their dog near a den that's marked, and the coyote wants to escort them away," says Wilkinson.

Experts believe climate change also plays a part in the escalation of human-carnivore conflicts, but the correlation still needs to be ironed out. "As finite resources become scarcer, carnivores and people are coming into more frequent contact, which means that more conflict could occur," says Jen Miller, international programme specialist for the US Fish & Wildlife Service. For example, she says, there was an uptick in lion attacks in western India during a drought when lions and people were relying on the same water sources.

(. . .) The likelihood of human-carnivore conflicts appears to be higher in areas of low-income countries dominated by vast rural landscapes and farmland, according to Penteriani's research. "There are a lot of working landscapes in the Global South that are really heterogeneous, that are interspersed with carnivore habitats, forests and savannahs, which creates a lot more opportunity for these encounters, just statistically," says Wilkinson.

MODERATE

Q18. According to the passage, which of the following scenarios would MOST likely exacerbate the frequency of carnivore-human conflicts?

- A. Attempting to photograph wild animals from within secured viewing areas in national parks and protected zones.
- B. Implementing 'food waste' management strategies to prevent wild animals being attracted to human food sources.
- C. Addressing the impact of climate change on the availability of resources for wildlife.
- D. Unleashing dogs by pet owners in areas with known high concentrations of large carnivores.

Answer Key: D

MODERATE

Q19. According to the passage, what is a significant factor that contributes to the habituation of carnivores to human presence?

- A. The natural aggression exhibited by carnivores, exacerbated by human interference, particularly when they are safeguarding their offspring or food sources.
- B. The increased scarcity of resources due to climate change, forcing carnivores to venture outside their natural habitats in search of sustenance.

- C. The predatory perception of humans as potential prey within the carnivores' food chain.
- D. The reduction in carnivores' instinctive fear response, resulting from their reliance upon human-provided food.

Answer Key: D

HARD

Q20. Which of the following statements, if false, would be inconsistent with the concerns raised in the passage regarding the drivers of carnivore-human conflicts?

- A. Climate change has had negligible effects on the frequency of carnivore-human interactions in affected regions.
- B. Carnivores lose their instinctive fear of humans, when consistently exposed to human food sources.
- C. Predatory attacks by carnivores are a common occurrence and have steadily increased over the past few decades.
- D. Human efforts to avoid risky behaviours around large carnivores have proven effective in reducing conflict incidents.

Answer Key: A

MODERATE

Q21. Given the insights provided by Penteriani's research and Wilkinson's statement, which of the following conclusions can be drawn about the relationship between landscape heterogeneity and human-carnivore conflicts?

- A. Homogeneous landscapes with uniform agricultural practices are more likely to experience high rates of human-carnivore conflicts due to the predictability of resources.
- B. Landscape heterogeneity, characterized by a mix of farmland and natural habitats, inherently reduces the chances of human-carnivore conflicts by providing more refuge for wildlife away from human activity.
- C. The diversity and interspersed nature of working landscapes with carnivore habitats in rural areas increase the statistical probability of encounters between humans and carnivores.
- D. Low-income countries with vast, contiguous wilderness areas are less prone to human-carnivore conflicts because these areas lack the human presence necessary for such encounters.

Answer Key: C

MODERATE

Q22. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

John Cleese told Fox News Digital that comedians do not have the freedom to be funny in 2022. "There's always been limitations on what they're allowed to say," Cleese said. "I think it's particularly worrying at the moment because you can only create in an atmosphere of freedom, where you're not checking everything you say critically before you move on. What you have to be able to do is to build without knowing where you're going because you've never been there before. That's what creativity is — you have to be allowed to build. And a lot of comedians now are sitting there and when they think of something, they say something like, 'Can I get away with it? I don't think so. So and so got into trouble, and he said that, oh, she said that.' You see what I mean? And that's the death of creativity."

- A. Comedians are being prevented from saying what they want and that is the death of this art form.
- B. Comedians must not check what they think and say. They must go where no one has gone before.
- C. Freedom and creativity are essential for comedy. Fear about offending people hinders originality.
- D. Creativity and critical thinking cannot work together. Comedians must first be creative, and later be critical.

Answer Key: C

EASY

Q23. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide where (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: [T]he Europeans did not invent globalization.

Paragraph: The first phase of globalization occurred long before the introduction of either steam or electric power...Chinese consumers at all social levels consumed vast quantities of spices, fragrant woods and unusual plants. The peoples of Southeast Asia

who lived in forests gave up their traditional livelihoods and completely reoriented their economies to supply Chinese consumers....__(1)__. These exchanges of the year 1000 opened some of the routes through which goods and peoples continued to travel after Columbus traversed the mid-Atlantic. __(2)__. Yet the world of 1000 differed from that of 1492 in important ways....the travellers who encountered one another in the year 1000 were much closer technologically. __(3)__. They changed and augmented what was already there since 1000. __(4)__. If globalization hadn't yet begun, Europeans wouldn't have been able to penetrate the markets in so many places as quickly as they did after 1492.

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

Answer Key: D

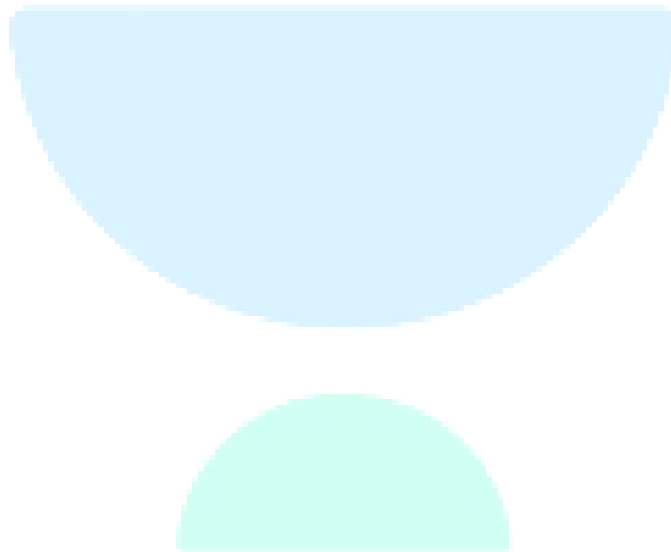
MODERATE

Q24. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

Different from individuals, states conduct warfare operations using the DIME model—"diplomacy, information, military, and economics." Most states do everything they can to inflict pain and confusion on their enemies before deploying the military. In fact, attacks on vectors of information are a well-worn tactic of war and usually are the first target when the charge begins. It's common for telecom data and communications networks to be routinely monitored by governments, which is why the open data policies of the web are so concerning to many advocates of privacy and human rights. With the worldwide adoption of social media, more governments are getting involved in low-grade information warfare through the use of cyber troops. According to a study by the Oxford Internet Institute in 2020, cyber troops are "government or political party actors tasked with manipulating public opinion online." The Oxford research group was able to identify 81 countries with active cyber troop operations utilizing many different strategies to spread false information, including spending millions on online advertising.

- A. As part of conducting information warfare as per the DIME model, many governments routinely monitor telecom data and communications networks, and use cyber troops on social media to manipulate public opinion.
- B. Following the DIME model, many governments have taken advantage of open data policies of the web to deploy cyber troops who manipulate domestic public opinion, using advertising and other strategies to spread false information.
- C. Governments primarily use the DIME model to deploy cyber troops who practise low-grade information warfare, seeking to manipulate public opinion with the objective of inflicting pain and confusion on their enemies.
- D. Using the DIME model, together with military operations, many governments simultaneously conduct information warfare with the help of cyber troops and routinely monitor telecom data and communications networks.

Answer Key: A



CAT 2024 Slot 2

QUANT

Topic: Arithmetic

Subtopic: Compound Interest and Simple Interest

Question Type: Numerical Based

Level of Difficulty: Moderate

Q1. Anil invests Rs 22000 for 6 years in a scheme with 4% interest per annum, compounded half-yearly. Separately, Sunil invests a certain amount in the same scheme for 5 years, and then reinvests the entire amount he receives at the end of 5 years, for one year at 10% simple interest. If the amounts received by both at the end of 6 years are equal, then the initial investment, in rupees, made by Sunil is

- A. 20860
- B. 20808
- C. 20480
- D. 20640

Answer key: B

Topic: Arithmetic

Subtopic: Compound Interest and Simple Interest

Question Type: Numerical Based

Level of Difficulty: Moderate

Q2. Bina incurs 19% loss when she sells a product at Rs. 4860 to Shyam, who in turn sells this product to Hari. If Bina would have sold this product to Shyam at the purchase price of Hari, she would have obtained 17% profit. Then, the profit, in rupees, made by Shyam is (TITA)

Answer Key: 2160

Topic: Arithmetic

Subtopic: Ages (Time Shift in Ratios)

Question Type: Concept Based

Level of Difficulty: Moderate

Q3. When Rajesh's age was same as the present age of Garima, the ratio of their ages was 3 : 2. When Garima's age becomes the same as the present age of Rajesh, the ratio of the ages of Rajesh and Garima will become

- A. 2:1
- B. 5:4
- C. 4:3
- D. 3:2

Answer Key: B

Topic: Arithmetic

Subtopic: Ages (Time Shift in Ratios)

Question Type: Concept Based

Level of Difficulty: Moderate

Q4. A company has 40 employees whose names are listed in a certain order. In the year 2022, the average bonus of the first 30 employees was Rs. 40000, of the last 30 employees was Rs. 60000, and of the first 10 and last 10 employees together was Rs. 50000. Next year, the average bonus of the first 10 employees increased by 100%, of the last 10 employees increased by 200% and of the remaining employees was unchanged. Then, the average bonus, in rupees, of all the 40 employees together in the year 2023 was

- A. 90000
- B. 80000
- C. 95000
- D. 85000

Answer Key: C

Topic: Arithmetic

Subtopic: Mixtures and Alligation

Question Type: Numerical Based

Level of Difficulty: Moderate

Q5. A vessel contained a certain amount of a solution of acid and water. When 2

litres of water was added. to it, the new solution had 50% acid concentration. When 15 litres of acid was further added to this new solution, the final solution had 80% acid concentration. The ratio of water and acid in the original solution was

- A. 4:5
- B. 3:5
- C. 5:3
- D. 5:4

Answer Key: B

Topic: Arithmetic

Subtopic: Time and Work (Variable Work Pattern)

Question Type: Numerical Based

Level of Difficulty: Difficult

Q6. Amal and Vimal together can complete a task in 150 days, while Vimal and Sunil together can complete the same task in 100 days. Amal starts working on the task and works for 75 days, then Vimal takes over and works for 135 days. Finally, Sunil takes over and completes the remaining task in 45 days. If Amal had started the task alone and worked on all days, Vimal had worked on every second day, and Sunil had worked on every third day, then the number of days required to complete the task would have been (TITA)

Answer Key: 139

Topic: Arithmetic

Subtopic: Time, Speed and Distance (Speed–Time Relationship)

Question Type: Numerical Based

Level of Difficulty: Difficult

Q7. A bus starts at 9 am and follows a fixed route every day. One day, it traveled at a constant speed of 60 km per hour and reached its destination 3.5 hours later than its scheduled arrival time. Next day, it traveled two-thirds of its route in one-third of its total scheduled travel time, and the remaining part of the route at 40 km per hour to reach just on time. The scheduled arrival time of the bus is

- A. 10:30 pm
- B. 7:00 pm

- C. 7:30 pm
- D. 9:00 pm

Answer key: C

Topic: Algebra
Subtopic: Surds and Radical Equations
Question Type: Numerical Based
Level of Difficulty: Easy

Q8. If $(x + 6\sqrt{2})^{1/2} - (x - 6\sqrt{2})^{1/2} = 2\sqrt{2}$, then x equals (TITA)

Answer Key: 11

Topic: Arithmetic
Subtopic: Percentages and Ratio Constraints
Question Type: Numerical Based
Level of Difficulty: Moderate

Q9. A fruit seller has a stock of mangoes, bananas and apples with at least one fruit of each type. At the beginning of a day, the number of mangoes make up 40% of his stock. That day, he sells half of the mangoes, 96 bananas and 40% of the apples. At the end of the day, he ends up selling 50% of the fruits. The smallest possible total number of fruits in the stock at the beginning of the day is (TITA)

Answer Key: 340

Topic: Algebra
Subtopic: Quadratic Equations and Root Properties
Question Type: Concept Based
Level of Difficulty: Moderate

Q10. The roots α, β of the equation $3x^2 + \lambda x - 1 = 0$, satisfy $\frac{1}{\alpha^2} + \frac{1}{\beta^2} = 15$. The value of $(\alpha^3 + \beta^3)^2$ is

- A. 16
- B. 4
- C. 1
- D. 9

Answer Key: B

Topic: Algebra

Subtopic: Quadratic Forms and Completing Square

Question Type: Numerical Based

Level of Difficulty: Difficult

Q11. If x and y are real numbers such that $4x^2 + 4y^2 - 4xy - 6y + 3 = 0$, then the value of $(4x + 5y)$ is (TITA)

Answer Key: 7

Topic: Modern Mathematics

Subtopic: Functional Equations

Question Type: Concept Based

Level of Difficulty: Difficult

Q12. A function f maps the set of natural numbers to whole numbers, such that $f(xy) = f(x)f(y) + f(x) + f(y)$ for all x, y and $f(p) = 1$ for every prime number p . Then, the value of $f(160000)$ is

- A. 8191
- B. 2047
- C. 4095
- D. 1023

Answer Key: C

Topic: Algebra

Subtopic: Logarithmic Equations and Inequalities

Question Type: Numerical Based

Level of Difficulty: Difficult

Q13. If a, b and c are positive real numbers such that $a > 10 \geq b \geq c$ and

$\frac{\log_8(a+b)}{\log_2 c} + \frac{\log_{27}(a-b)}{\log_3 c} = \frac{2}{3}$, then the greatest possible integer value of a is (TITA)

Answer Key: 14

Topic: Algebra

Subtopic: System of Equations

Question Type: Concept Based

Level of Difficulty: Easy

Q14. If x and y satisfy the equations $|x| + x + y = 15$ and $x + |y| - y = 20$, then $(x - y)$ equals

A. 20

B. 10

C. 15

D. 5

Answer key : C

Topic: Algebra

Subtopic: Rational Inequalities

Question Type: Concept Based

Level of Difficulty: Moderate

Q15. All the values of x satisfying the inequality $\frac{1}{x+5} \leq \frac{1}{2x-3}$ are

A. $-5 < x < \frac{3}{2}$ or $\frac{3}{2} < x \leq 8$

B. $-5 < x < \frac{3}{2}$ or $x > \frac{3}{2}$

C. $x < -5$ or $x > \frac{3}{2}$

D. $x < -5$ or $\frac{3}{2} < x \leq 8$

Answer key : D

Topic: Algebra

Subtopic: Infinite Series

Question Type: Concept Based

Level of Difficulty: Difficult

Q16. The sum of the infinite series

$\frac{1}{5}\left(\frac{1}{5} - \frac{1}{7}\right) + \left(\frac{1}{5}\right)^2\left(\left(\frac{1}{5}\right)^2 - \left(\frac{1}{7}\right)^2\right) + \left(\frac{1}{5}\right)^3\left(\left(\frac{1}{5}\right)^3 - \left(\frac{1}{7}\right)^3\right) + \dots$ is equal to

- A. $\frac{5}{408}$
- B. $\frac{7}{816}$
- C. $\frac{7}{408}$
- D. $\frac{5}{816}$

Answer Key: A

Topic: Number System

Subtopic: Remainders and Cyclicity

Question Type: Concept Based

Level of Difficulty: Easy

Q17. When 3^{333} is divided by 11, the remainder is

- A. 10
- B. 1
- C. 6
- D. 5

Answer Key: D

Topic: Geometry

Subtopic: Circle Geometry (Mutually Tangent Circles)

Question Type: Concept Based

Level of Difficulty: Difficult

Q18. Three circles of equal radii touch (but not cross) each other externally. Two other circles, X and Y, are drawn such that both touch (but not cross) each of the three previous circles. If the radius of X is more than that of Y, the ratio of the radii of X and Y is

- A. $4 + 2\sqrt{3} : 1$
- B. $7 + 4\sqrt{3} : 1$
- C. $2 + \sqrt{3} : 1$
- D. $4 + \sqrt{3} : 1$

Answer Key: B

Topic: Geometry

Subtopic: Circle Geometry (Mutually Tangent Circles)

Question Type: Concept Based

Level of Difficulty: Difficult

Q19. ABCD is a trapezium in which AB is parallel to CD. The sides AD and BC when extended, intersect at point E. If AB = 2 cm, CD = 1 cm, and perimeter of ABCD is 6 cm, then the perimeter, in cm, of $\triangle AEB$ is

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

Answer Key: A

Topic: Geometry

Subtopic: Coordinate Geometry (Triangle Inradius)

Question Type: Numerical Based

Level of Difficulty: Moderate

Q20. The coordinates of the three vertices of a triangle are: (1, 2), (7, 2), and (1, 10). Then the radius of the incircle of the triangle is (TITA)

Answer Key: 2

Topic: Modern Mathematics

Subtopic: Counting / Combinatorics (Path Counting)

Question Type: Numerical Based

Level of Difficulty: Difficult

Q21. P, Q, R and S are four towns. One can travel between P and Q along 3 direct paths, between Q and S along 4 direct paths, and between P and R along 4 direct paths. There is no direct path between P and S, while there are few direct paths between Q and R, and between R and S. One can travel from P to S either via Q, or via R, or via Q followed by R, respectively, in exactly 62 possible ways. One can also travel from Q to R either directly, or via P, or via S, in exactly 27 possible ways. Then, the number of direct paths between Q and R is (TITA)

Answer Key: 7

Topic: Number System

Subtopic: Exponents and Powers

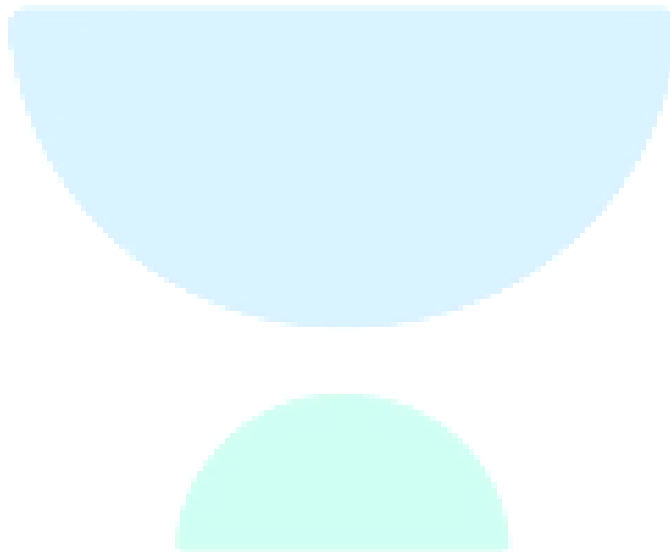
Question Type: Concept Based

Level of Difficulty: Moderate

Q22. If m and n are natural numbers such that $n > 1$, and $m^n = 2^{25} \times 3^{40}$, then $m - n$ equals

- A. 209932
- B. 209937
- C. 209947
- D. 209942

Answer Key: C



CAT 2024 Slot 2

LRDI

SET 1. Read the information given below and answer the question that follows:

The numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 are placed in ten slots of the following grid based on the conditions below.

	Column 1	Column 2	Column 3	Column 4
Row 1				
Row 2				
Row 3				
Row 4				

1. Numbers in any row appear in an increasing order from left to right.
2. Numbers in any column appear in a decreasing order from top to bottom.
3. 1 is placed either in the same row or in the same column as 10.
4. Neither 2 nor 3 is placed in the same row or in the same column as 10.
5. Neither 7 nor 8 is placed in the same row or in the same column as 9.
6. 4 and 6 are placed in the same row.

Q1. What is the row number which has the least sum of numbers placed in that row? (TITA)

Answer Key: 4

Q2. Which of the following statements MUST be true?

I. 10 is placed in a slot in Row 1.

II. 1 is placed in a slot in Row 4.

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

Answer Key: A

Q3. Which of the following statements MUST be true?

I. 2 is placed in a slot in Column 2.

II. 3 is placed in a slot in Column 3.

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

Answer Key: B

Q4. For how many slots in the grid, placement of numbers CANNOT be determined with certainty? (TITA)

Answer Key: 2

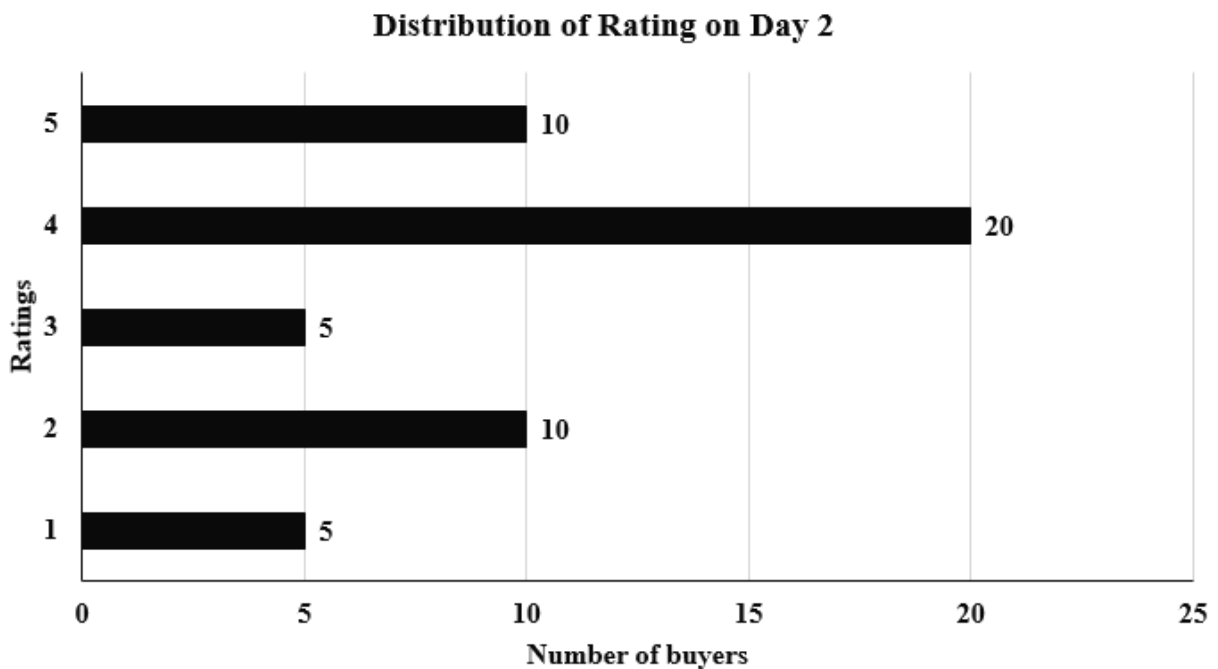
Q5. What is the sum of the numbers placed in Column 4? (TITA)

Answer Key: 26

SET 2. Read the information given below and answer the question that follows:

An online e-commerce firm receives daily integer product ratings from 1 through 5 given by buyers. The daily average is the average of the ratings given on that day. The cumulative average is the average of all ratings given on or before that day.

The rating system began on Day 1, and the cumulative averages were 3 and 3.1 at the end of Day 1 and Day 2, respectively. The distribution of ratings on Day 2 is given in the figure below.



The following information is known about ratings on Day 3.

1. 100 buyers gave product ratings on Day 3.
2. The modes of the product ratings were 4 and 5.
3. The numbers of buyers giving each product rating are non-zero multiples of 10.
4. The same number of buyers gave product ratings of 1 and 2, and that number is half the number of buyers who gave a rating of 3.

Q6. How many buyers gave ratings on Day 1? (TITA)

Answer Key: 150

Q7. What is the median of all ratings given on Day 3? (TITA)

Answer Key: 4

Q8. What is the daily average rating of Day 3?

- A. 3.5
- B. 3.2
- C. 3.0
- D. 3.6

Answer Key: D

Q9. Which of the following is true about the cumulative average ratings of Day 2 and Day 3?

- A. The cumulative average of Day 3 increased by less than 5% from Day 2.
- B. The cumulative average of Day 3 increased by more than 8% from Day 2.
- C. The cumulative average of Day 3 increased by a percentage between 5% and 8% from Day 2.
- D. The cumulative average of Day 3 decreased from Day 2.

Answer Key: C

SET 3. Read the information given below and answer the question that follows:

Eight gymnastics players numbered 1 through 8 underwent a training camp where they were coached by three coaches - Xena, Yuki, and Zara. Each coach trained at least two players. Yuki trained only even numbered players, while Zara trained only odd numbered players. After the camp, the coaches evaluated the players and gave integer ratings to the respective players trained by them on a scale of 1 to 7, with 1 being the lowest rating and 7 the highest.

The following additional information is known.

1. Xena trained more players than Yuki.
2. Player-1 and Player-4 were trained by the same coach, while the coaches who trained Player-2, Player-3 and Player-5 were all different.
3. Player-5 and Player-7 were trained by the same coach and got the same rating. All other players got a unique rating.
4. The average of the ratings of all the players was 4.
5. Player-2 got the highest rating.
6. The average of the ratings of the players trained by Yuki was twice that of the players trained by Xena and two more than that of the players trained by Zara.
7. Player-4's rating was double of Player-8's and less than Player-5's.

Q10. What best can be concluded about the number of players coached by Zara?

- A. Exactly 3
- B. Either 2 or 3 or 4
- C. Exactly 2
- D. Either 2 or 3

Answer Key: C

Q11. What was the rating of Player-7? (TITA)

Answer Key: 4

Q12. What was the rating of Player-6? (TITA)

Answer Key: 5

Q13. For how many players the ratings can be determined with certainty? (TITA)

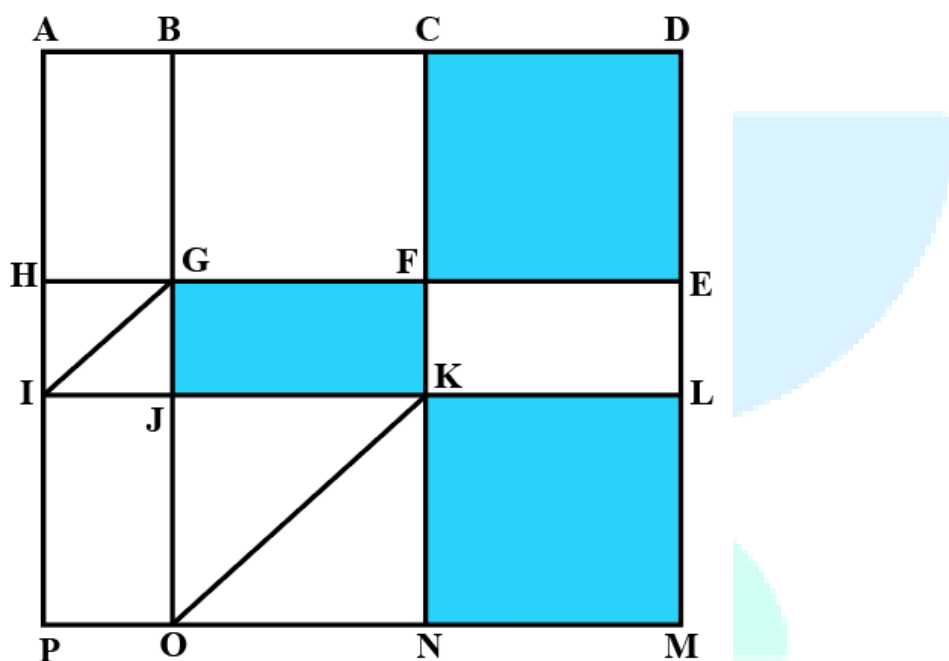
Answer Key: 6

Q14. Who all were the players trained by Xena?

- A. Player-1, Player-3, Player-4, Player-6
- B. Player-1, Player-4, Player-6, Player-8
- C. Player-1, Player-3, Player-4, Player-8
- D. Player-1, Player-3, Player-4

Answer Key: C

SET 4. Read the information given below and answer the question that follows:



The above is a schematic diagram of walkways (indicated by all the straight-lines) and lakes (3 of them, each in the shape of rectangles – shaded in the diagram) of a gated area. Different points on the walkway are indicated by letters (A through P) with distances being $OP = 150$ m, $ON = MN = 300$ m, $ML = 400$ m, $EL = 200$ m, $DE = 400$ m.

The following additional information about the facilities in the area is known.

1. The only entry/exit point is at C.
2. There are many residences within the gated area; all of them are located on the path AH and ML with four of them being at A, H, M, and L.
3. The post office is located at P and the bank is located at B.

Q15. One resident whose house is located at L, needs to visit the post office as well as the bank. What is the minimum distance (in m) he has to walk starting from his residence and returning to his residence after visiting both the post office and the bank?

- A. 3200
- B. 2700
- C. 3000
- D. 3000

Answer Key: A

Q16. One person enters the gated area and decides to walk as much as possible before leaving the area without walking along any path more than once and always walking next to one of the lakes. Note that he may cross a point multiple times. How much distance (in m) will he walk within the gated area?

- A. 3800
- B. 2800
- C. 3000
- D. 3200

Answer Key: A

Q17. One resident takes a walk within the gated area starting from A and returning to A without going through any point (other than A) more than once. What is the maximum distance (in m) she can walk in this way? (TITA)

Answer Key: 5100

Q18.Visitors coming for morning walks are allowed to enter as long as they do not pass by any of the residences and do not cross any point (except C) more than once. What is the maximum distance (in m) that such a visitor can walk within the gated area? (TITA)

Answer Key: 3500

SET 5. Read the information given below and answer the question that follows:

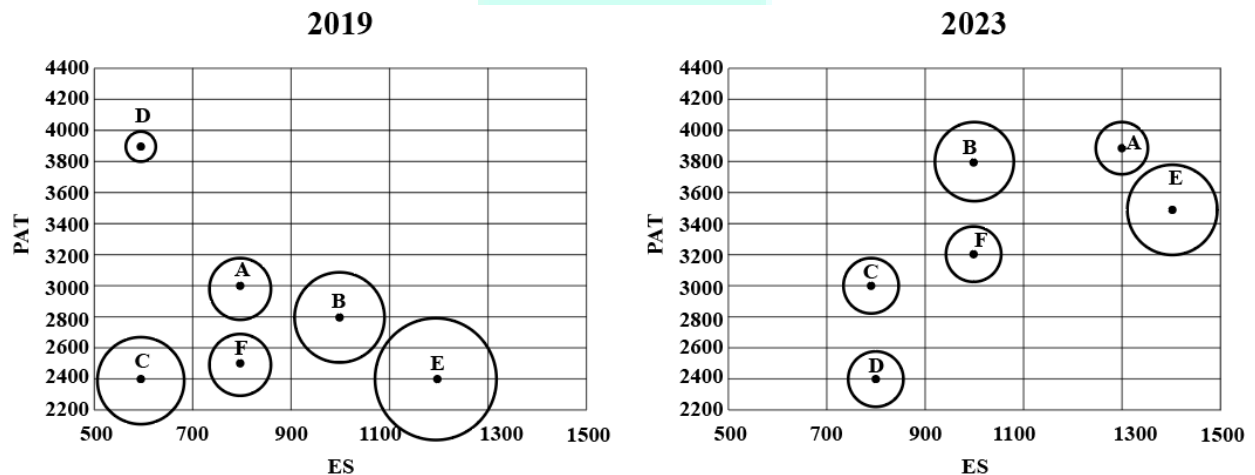
The two plots below give the following information about six firms A, B, C, D, E, and F for 2019 and 2023.

PAT: The firm's profits after taxes in Rs. crores,

ES: The firm's employee strength, that is the number of employees in the firm, and

PRD: The percentage of the firm's PAT that they spend on Research and Development (R&D).

In the plots, the horizontal and vertical coordinates of point representing each firm gives their ES and PAT values respectively. The PRD values of each firm are proportional to the areas around the points representing each firm. The areas are comparable between the two plots, i.e., equal areas in the two plots represent the same PRD values for the two years.



Q19. Assume that the annual rate of growth in PAT over the previous year (ARG) remained constant over the years for each of the six firms. Which among the firms A, B, C, and E had the highest ARG?

- A. Firm C
- B. Firm B
- C. Firm A
- D. Firm E

Answer Key: D

Q20. The ratio of the amount of money spent by Firm C on R&D in 2019 to that in 2023 is closest to

- A. 5 : 9
- B. 9 : 5
- C. 9 : 4
- D. 5 : 6

Answer Key: B

Q21. Which among the firms A, C, E, and F had the maximum PAT per employee in 2023?

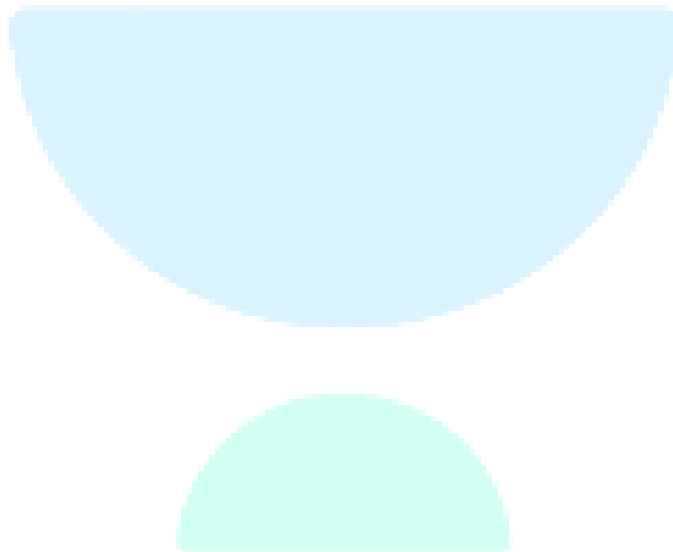
- A. Firm C
- B. Firm A
- C. Firm E
- D. Firm F

Answer Key: A

Q22. Which among the firms C, D, E, and F had the least amount of R&D spending per employee in 2023?

- A. Firm D
- B. Firm E
- C. Firm C
- D. Firm F

Answer Key: A



CAT 2024 Slot 3

VARC

HARD

Q1. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

Lyric poetry is a genre of private meditation rather than public commitment. The impulse in Marxism toward changing a society deemed unacceptable in its basic design would seem to place demands on lyric poetry that such poetry, with its tendency toward the personal, the small scale, and the idiosyncratic, could never answer. There is within Marxism, however, also a strand of thought that would locate in lyric poetry alternative modes of perception and description that call forth a vision of worlds at odds with a repressive reality or that draw attention to the workings of ideology within the hegemonic culture. The poetic imagination may indeed deflect larger social concerns, but it may also be implicitly critical and utopian.

- A. Marxism has internal contradictions due to which one strand of Marxism sees no merit in lyric poetry while another appreciates the alternative modes of perception in poetry.
- B. The focus of lyric poetry is largely personal while that of Marxism is bringing change in society. Unless the difference is resolved, poetry will remain largely utopian.
- C. Marxism makes unreasonable demands on lyric poetry. However, lyric poetry has its own merits that are largely ignored by Marxism due to its personal nature.
- D. The focus of lyric poetry as personal may not seem compatible with Marxism. However, it is possible to envisage lyric poetry as a symbol of resistance against an oppressive culture.

Answer Key: D

HARD

Q2. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide where (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: Taken outside the village of Trang Bang on June 8, 1972, the picture captured the trauma and indiscriminate violence of a conflict that claimed, by some estimates, a million or more civilian lives.

Paragraph: The horrifying photograph of children fleeing a deadly napalm attack has become a defining image not only of the Vietnam War but the 20th century. ____ (1) ____ . Dark smoke billowing behind them, the young subjects' faces are painted with a mixture of terror, pain and confusion. ____ (2) ____ . Soldiers from the South Vietnamese army's 25th Division follow helplessly behind. ____ (3) ____ . The picture was officially titled "The Terror of War," but the photo is better known by the nickname given to naked 9-year-old at its centre "Napalm Girl". ____ (4) ____ .

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

Answer Key: B

EASY

Q3. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

Humans have managed to tweak the underlying biology of various plants and animals to produce high-tech crops and microbes. But regulating these entities is complicated, as the framework of policies and procedures are outdated and not flexible enough to adapt to emerging technology. The question is whether regulation will ever be able to keep up with human innovation, to regulate living things, which are apt to be unpredictable and unique; to capture all the potential risks when new biological entities are introduced, or when they pass on variations of their genes?

- A. A new framework of rules and procedures for regulating the most recent research emerging from biotechnology is urgently needed, to keep up with this rapidly changing discipline.
- B. Current regulation of biotechnology is outdated, but it is debatable if we can create a framework, imaginative and flexible, to cover all contingencies in this fast-changing area.
- C. The problem with formulating regulation for innovation in the scientific arena is that it is impossible to imagine the outcomes or risks related to the outcomes of all the research.

D. The mercurial nature of biological entities calls for scientists to shape the regulations governing emerging technology, with regular calibration to handle variations in the field

Answer Key: B

Argumentative/Persuasive (4-7)

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

There is a group in the space community who view the solar system not as an opportunity to expand human potential but as a nature preserve, forever the provenance of an elite group of scientists and their sanitary robotic probes. These planetary protection advocates [call] for avoiding "harmful contamination" of celestial bodies. Under this regime, NASA incurs great expense sterilizing robotic probes in order to prevent the contamination of entirely theoretical biospheres. . . .

Transporting bacteria would matter if Mars were the vital world once imagined by astronomers who mistook optical illusions for canals. Nobody wants to expose Martians to measles, but sadly, robotic exploration reveals a bleak, rusted landscape, lacking oxygen and flooded with radiation ready to sterilize any Earthly microbes. Simple life might exist underground, or down at the bottom of a deep canyon, but it has been very hard to find with robots. . . . The upsides from human exploration and development of Mars clearly outweigh the welfare of purely speculative Martian fungi. . . .

The other likely targets of human exploration, development, and settlement, our moon and the asteroids, exist in a desiccated, radiation-soaked realm of hard vacuum and extreme temperature variations that would kill nearly anything. It's also important to note that many international competitors will ignore the demands of these protection extremists in any case. For example, China recently sent a terrarium to the moon and germinated a plant seed—with, unsurprisingly, no protest from its own scientific community. In contrast, when it was recently revealed that a researcher had surreptitiously smuggled super-resilient microscopic tardigrades aboard the ill-fated Israeli Beresheet lunar probe, a firestorm was unleashed within the space community. . . .

NASA's previous human exploration efforts made no serious attempt at sterility, with little notice. As the Mars expert Robert Zubrin noted in the National Review, U.S. lunar landings did not leave the campsites cleaner than they found it. Apollo's bacteria-infested litter included bags of feces. Forcing NASA's proposed Mars exploration to do better, scrubbing everything and hauling out all the trash, would

destroy NASA's human exploration budget and encroach on the agency's other directorates, too. Getting future astronauts off Mars is enough of a challenge, without trying to tote weeks of waste along as well.

A reasonable compromise is to continue on the course laid out by the U.S. government and the National Research Council, which proposed a system of zones on Mars, some for science only, some for habitation, and some for resource exploitation. This approach minimizes contamination, maximizes scientific exploration . . . Mars presents a stark choice of diverging human futures. We can turn inward, pursuing ever more limited futures while we await whichever natural or manmade disaster will eradicate our species and life on Earth. Alternatively, we can choose to propel our biosphere further into the solar system, simultaneously protecting our home planet and providing a backup plan for the only life we know exists in the universe. Are the lives on Earth worth less than some hypothetical microbe lurking under Martian rocks?

MODERATE

Q4. The author mentions all of the following reasons to dismiss concerns about contaminating Mars EXCEPT:

- A. the lack of evidence of living organisms on Mars makes possible contamination from earthly microbes a moot point.
- B. the use of similar probes on astronomical bodies like the moon have had little effect on the environment.
- C. efforts to contain contamination on Mars are likely to be derailed as competitor countries may not follow similar restrictions.
- D. earlier explorations have already contaminated pristine space environments.

Answer Key: B

MODERATE

Q5. The author's overall tone in the first paragraph can be described as

- A. approving of the amount of money NASA spends to restrict the spread of contamination in space.
- B. sceptical about the excessive efforts to sanitise planets where life has not yet been proven to exist.
- C. indifferent to the elitism of a few scientists aiming to corner space exploration.

D. equivocal about the reasons extended by the group of scientists seeking to limit space exploration.

Answer Key: B

MODERATE

Q6. The author is unlikely to disagree with any of the following EXCEPT:

- A. the proposal for a zonal segregation of the Martian landscape into regions for different purposes.
- B. that while NASA's earlier missions were not ideal in their approach to space contamination, they likely did no grave damage.
- C. space contamination should be minimised until the possibility of life on the astronomical body being explored is ruled out.
- D. the exorbitant costs of continuing to keep the space environment pristine may be unsustainable.

Answer Key: C

MODERATE

Q7. The contrasting reactions to the Chinese and Israeli "contaminations" of lunar space

- A. are evidence of China's reasonable approach towards space contamination.
- B. are valid as the contamination of the lunar environment from animal sources is far greater than from plants.
- C. reveal global biases prevalent in attitudes towards different countries.
- D. indicate that national scientists may have different sensitivities to issues of biosphere protection.

Answer Key: D

MODERATE

Q8. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide where (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: Many have had to leave their homes behind, with more than 1.3 million people being displaced due to the drought.

Passage: Somalia has been dealing with an enormous humanitarian catastrophe, driven by the longest and most severe drought the country has experienced in at least 40 years. ___(1)___ . Five consecutive rainy seasons have failed, causing more than 8 million people - almost half of the country's population – to experience acute food insecurity. ___(2)___ . More than 43,000 people are believed to have lost their lives, with half of the lives lost likely being children under five. The damage the drought has caused is far-reaching. ___(3)___ . Farmers have lost all their agricultural income, while pastoralists have lost more than 3 million livestock, impoverishing entire communities, and leaving them on the brink of famine. ___(4)___ . Some, like the pastoralists, may never be able to go back as their livelihoods have been irreversibly wiped out.

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

Answer Key: A

Argumentative/Persuasive (9-12)

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

Languages become endangered and die out for many reasons. Sadly, the physical annihilation of communities of native speakers of a language is all too often the cause of language extinction. In North America, European colonists brought death and destruction to many Native American communities. This was followed by US federal policies restricting the use of indigenous languages, including the removal of native children from their communities to federal boarding schools where native languages and cultural practices were prohibited. As many as 75 percent of the languages spoken in the territories that became the United States have gone extinct, with slightly better language survival rates in Central and South America . . .

Even without physical annihilation and prohibitions against language use, the language of the "dominant" cultures may drive other languages into extinction; young people see education, jobs, culture and technology associated with the dominant language and focus their attention on that language. The largest language "killers" are English,

Spanish, Portuguese, French, Russian, Hindi, and Chinese, all of which have privileged status as dominant languages threatening minority languages.

When we lose a language, we lose the worldview, culture and knowledge of the people who spoke it, constituting a loss to all humanity. People around the world live in direct contact with their native environment, their habitat. When the language they speak goes extinct, the rest of humanity loses their knowledge of that environment, their wisdom about the relationship between local plants and illness, their philosophical and religious beliefs as well as their native cultural expression (in music, visual art and poetry) that has enriched both the speakers of that language and others who would have encountered that culture. . . .

As educators deeply immersed in the liberal arts, we believe that educating students broadly in all facets of language and culture . . . yields immense rewards. Some individuals educated in the liberal arts tradition will pursue advanced study in linguistics and become actively engaged in language preservation, setting out for the Amazon, for example, with video recording equipment to interview the last surviving elders in a community to record and document a language spoken by no children.

Certainly, though, the vast majority of students will not pursue this kind of activity. For these students, a liberal arts education is absolutely critical from the twin perspectives of language extinction and global citizenship. When students study languages other than their own, they are sensitized to the existence of different cultural perspectives and practices. With such an education, students are more likely to be able to articulate insights into their own cultural biases, be more empathetic to individuals of other cultures, communicate successfully across linguistic and cultural differences, consider and resolve questions in a way that reflects multiple cultural perspectives, and, ultimately extend support to people, programs, practices, and policies that support the preservation of endangered languages.

There is ample evidence that such preservation can work in languages spiraling toward extinction. For example, Navajo, Cree and Inuit communities have established schools in which these languages are the language of instruction and the number of speakers of each has increased.

MODERATE

Q9. The author believes that a liberal arts education combined with participation in language preservation empower students in all of the following ways EXCEPT that they will

- A. develop a better understanding of their own culture.
- B. learn different languages.
- C. establish schools to preserve languages spiralling towards extinction.
- D. overcome cultural barriers to communication

Answer Key: C

MODERATE

Q10. It can be inferred from the passage that it is likely South America had a slightly better language survival rate than North America for all of the following reasons EXCEPT:

- A. European colonists allowed children of native speakers to stay at home with their families.
- B. not many native speakers were killed by European colonists.
- C. the colonial government was unable to mainstream the locals.
- D. locals were provided job opportunities in the colonial administration.

Answer Key: D

MODERATE

Q11. Which one of the following hypothetical scenarios, if true, would most strongly undermine the central ideas of the passage?

- A. A liberal arts education requires that, in addition to being fluent in English, students gain fluency in two of the top five most spoken languages globally.
- B. Schools that teach endangered languages can preserve the language only for a generation.
- C. Recording a dying language that has only a few remaining speakers freezes it in time: it stops evolving further.
- D. Most liberal arts students will pursue jobs in publishing and human resource management rather than doctorates in linguistics.

Answer Key: A

MODERATE

Q12. In the context of the passage, which one of the following hypothetical scenarios, if true, is NOT an example of the kind of loss that occurs when a language becomes extinct?

- A. The Inuits of Alaska have 35 different words to describe the texture of snow. When the language becomes extinct, we will lose that understanding of nature.
- B. The Lamkangs of Manipur have only 3 remaining native speakers of the language. When they die, we will lose one more group from the government list of indigenous tribes.
- C. The Andamanese language has a word to describe someone who has lost a step-sister. When the language dies, we will lose the concept of the word and the emotions it evokes.
- D. The Nicobarese language describes 20 different moods of the ocean. By the time the last speaker is educated in a Central Board school, they will have forgotten their language.

Answer Key: B

MODERATE

Q13. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide where (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: This reality is putting stress on employees who have to pay for transport, desk lunches, more childcare, clothing and that after-work socialisation – costs they haven't incurred for nearly two years.

Paragraph: ___(1)___ . Prices are rising at their fastest rate in 40 years, consequently, return-to-office-related costs have shot up – think petrol and food, for instance.

___(2)___ . Yet wages haven't kept up with inflation – even despite the salary growth many workers have enjoyed during a favourable pandemic labour market. ___(3)___ .

This is especially jarring for workers who were able to save during remote work, when these expenditures weren't a factor. ___(4)___ . In April 2022, Umus, a London university lecturer, told BBC Worklife that they were spending nearly a quarter of what they made every day on return-to-work costs.

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

Answer Key: B

Analytical (14-17)

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

Moutai has been the global booze sensation of the decade. A bottle of its Flying Fairy which sold in the 1980s for the equivalent of a dollar now retails for \$400. Moutai's listed shares have soared by almost 600% in the past five years, outpacing the likes of Amazon. . . .

It does this while disregarding every Western marketing mantra. It is not global, has meagre digital sales and does not appeal to millennials. It scores pitifully on environmental, social and governance measures. In the Boy Scout world of Western business it would leave a bad taste, in more ways than one.

Moutai owes its intoxicating success to three factors—not all of them easy to emulate. First, it profits from Chinese nationalism. Moutai is known as the "national liquor". It was used to raise spirits and disinfect wounds in Mao's Long March. It was Premier Zhou Enlai's favourite tippie, shared with Richard Nixon in 1972. Its centuries-old craftsmanship—it is distilled eight times and stored for years in earthenware jars—is a source of national pride. It also claims to be hangover-proof, which would make it an invention to rival gunpowder....

Second, it chose to serve China's super-rich rather than its middle class. Markets are littered with the corpses of firms that could not compete in the cut-throat battle for Chinese middle-class wallets. And the country's premium market is massive—at 73m-strong, bigger than the population of France, notes Euan McLeish of Bernstein, an investment firm, and still less crowded with prestige brands than advanced economies. Moutai is to these well-heeled drinkers what vintage champagne is to the rest of the world.....

Third, Moutai looks beyond affluent millennials and digital natives. The elderly and the middle-aged, it found, can be just as lucrative. Its biggest market now is (male) drinkers in their mid-30s. Many have no siblings, thanks to four decades of China's one-child policy—which also means their elderly parents can splash out on weddings and banquets. Moutai is often a guest of honour.

Moutai has succeeded thanks to nationalism, elitism and ageism, in other words—not in spite of this unholy trinity. But it faces risks. The government is its largest shareholder—and a meddling one. It appears to want prices to remain stable. Exorbitantly priced booze is at odds with its professed socialist ideals. Yet minority investors—including many foreign funds—lament that Moutai's wholesale price is a third of what it sells for in shops. Raising it could boost the company's profits further. Instead, in what some see as a travesty of corporate governance, its majority owner has plans to set up its own sales channel.....

In the long run, its biggest risk may be millennials. As they grow older, health concerns, work-life balance and the desire for more wholesome pursuits than binge-drinking may curb the "Ganbei!" toasting culture [heavy drinking] on which so much of the demand for Moutai rests. For the time being, though, the party goes on.

MODERATE

Q14. Which one of the following is both a reason for Moutai's success as well as a possible threat to that success?

- A. Its appeal to the rich.
- B. Government involvement in its business.
- C. Its appeal to the older age group.
- D. Chinese love of liquor filled celebration.

Answer Key: C

MODERATE

Q15. In the context of the passage we can infer that to succeed in the liquor industry in China, a marketing firm must consider all of the following factors affecting the Chinese liquor market EXCEPT that

- A. the competition for winning over the middle class is very stiff.
- B. there is money to be made from marketing to the middle class.
- C. the government may control the pricing of products.
- D. there are few competitors to meet the demands of high end liquor consumers

Answer Key: B

EASY

Q16. In the context of the passage, it is most likely that the author refers to Moutai's marketing strategy as "the unholy trinity" because

- A. it profits from Chinese nationalist feelings.
- B. it exposes the firm to long term risks.
- C. it contradicts the Western strategy of marketing.
- D. there is nothing holy about marketing techniques for liquor.

Answer Key: C

EASY

Q17. The phrase "would make it an invention to rival gunpowder" has been used in the passage in a sense that is

- A. substantive.
- B. metaphorical.
- C. literal.
- D. synonymical.

Answer Key: B

MODERATE

Q18. Five jumbled up sentences (labelled 1, 2, 3, 4 and 5), related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd sentence and key in the number of that sentence as your answer.

1. To create a synapse, the neuron has specialized structures, often seen as tiny swellings, at its terminal end of the axon where it stores the chemicals that are emitted to transmit a signal to the next neuron.
2. This fetal warm-up act—the soldering of neural connections before the eyes actually function—is crucial to the performance of the visual system.
3. The reasons for this paring back of synapses is a mystery, but synaptic pruning is thought to sharpen and reinforce the "correct" synapses, while removing the weak and unnecessary ones.

4. Neural connections between the eyes and the brain are formed long before birth, establishing the wiring and the circuitry that allow a child to begin visualizing the world the minute she emerges from the womb.
5. During this rehearsal period, synapses—points of chemical connection—between nerve cells are generated in great excess, only to be pruned back during later development.

Answer Key: 1

MODERATE

Q19. Five jumbled up sentences (labelled 1, 2, 3, 4 and 5), related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd sentence and key in the number of that sentence as your answer.

1. Part of the appeal of forecasting is not just that it seems to work, but that you don't seem to need specialized expertise to succeed at it.
2. The tight connection between forecasting and building a model of the world helps explain why so much of the early interest in the idea came from the intelligence community.
3. This was true even though the latter had access to classified intelligence.
4. One frequently cited study found that accurate forecasters' predictions of geopolitical events, when aggregated using standard scientific methods, were more accurate than the forecasts of members of the US intelligence community who answered the same questions in a confidential prediction market.
5. The aggregated opinions of non-experts doing forecasting have proven to be a better guide to the future than the aggregated opinions of experts.

Answer Key: 2

MODERATE

Q20. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

When the tradwife puts on that georgic, pinstriped dress, she is not just admiring the visual cues of a fantastical past. She takes these dreams of storybook bliss literally, tracing them backward in time until she reaches a logical conclusion that satisfies her. And by doing so, she ends up delivering an unhappy reminder of just how much our lives consist of artifice and playacting. The tradwife outrages people because of her

deliberately regressive ideals. And yet her behaviour is, on some level, indistinguishable from the nontradwife's. The tradwife's trollish genius is to beat us at our own dress-up game. By insisting that the idyllic cottage daydream should be real, right down to the primitive gender roles, she leaves others feeling hollow, cheated. The hullabaloo and headaches she causes may be the price we pay for taking too many things at face value: our just deserts, served Instagram-perfect by a manicured hand on a gorgeous ceramic dish, with fat, mouthwatering maraschino cherries on top.

- A. The tradwife, with her vintage dress and traditional roles, highlights the superficiality of modern life and challenges current societal norms.
- B. The tradwife's commitment to outdated gender roles and retro fashion critiques the superficiality of today's societal ideals.
- C. By promoting an idealized past, the tradwife exposes the artifice of contemporary values and mocks societal norms.
- D. The tradwife's vintage dress and adherence to traditional roles reveal the artificial nature of modern life and its superficial values.

Answer Key: A

Argumentative/Persuasive (21-24)

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

Fears of artificial intelligence (AI) have haunted humanity since the very beginning of the computer age. Hitherto these fears focused on machines using physical means to kill, enslave or replace people. But over the past couple of years new AI tools have emerged that threaten the survival of human civilisation from an unexpected direction. AI has gained some remarkable abilities to manipulate and generate language, whether with words, sounds or images. AI has thereby hacked the operating system of our civilisation.

Language is the stuff almost all human culture is made of. Human rights, for example, aren't inscribed in our DNA. Rather, they are cultural artefacts we created by telling stories and writing laws. Gods aren't physical realities. Rather, they are cultural artefacts we created by inventing myths and writing scriptures....What would happen once a non-human intelligence becomes better than the average human at telling stories, composing melodies, drawing images, and writing laws and scriptures? When people think about Chatgpt and other new AI tools, they are often drawn to examples like school children using AI to write their essays. What will happen to the school system

when kids do that? But this kind of question misses the big picture. Forget about school essays. Think of the next American presidential race in 2024, and try to imagine the impact of AI tools that can be made to mass-produce political content, fake-news stories and scriptures for new cults...

Through its mastery of language, AI could even form intimate relationships with people, and use the power of intimacy to change our opinions and worldviews. Although there is no indication that AI has any consciousness or feelings of its own, to foster fake intimacy with humans it is enough if the AI can make them feel emotionally attached to it....

What will happen to the course of history when AI takes over culture, and begins producing stories, melodies, laws and religions? Previous tools like the printing press and radio helped spread the cultural ideas of humans, but they never created new cultural ideas of their own. AI is fundamentally different. AI can create completely new ideas, completely new culture.... Of course, the new power of AI could be used for good purposes as well. I won't dwell on this, because the people who develop AI talk about it enough....

We can still regulate the new AI tools, but we must act quickly. Whereas nukes cannot invent more powerful nukes, AI can make exponentially more powerful AI.... Unregulated AI deployments would create social chaos, which would benefit autocrats and ruin democracies. Democracy is a conversation, and conversations rely on language. When AI hacks language, it could destroy our ability to have meaningful conversations, thereby destroying democracy.... And the first regulation I would suggest is to make it mandatory for AI to disclose that it is an AI. If I am having a conversation with someone, and I cannot tell whether it is a human or an AI—that's the end of democracy. This text has been generated by a human. Or has it?

MODERATE

Q21. The author identifies all of the following as dire outcomes of the capture of language by AI EXCEPT that it could

- A. out-strip human creativity and endeavours in the spheres such as art and music and, in the formulation of laws.
- B. apply its mastery of language to create strong emotional ties which could exacerbate the polarization of political views.
- C. spawn a completely new culture through its ability to create new ideas and opinions.

D. eventually subvert democratic processes through the mass creation and spread of fake political content and news.

Answer Key: B

EASY

Q22. The author terms language "the operating system of our civilization" for all the following reasons EXCEPT that it

A. is fundamental to the articulation and spread of human values and culture in our society.

B. has laid the foundation for the creation of cultural artefacts through writing and telling of stories.

C. can influence political views and opinions as it engenders close emotional ties among people.

D. is the basis of AI tools like ChatGPT which can be used to generate academic content and opinion.

Answer Key: D

MODERATE

Q23. The tone of the passage could best be described as

A. cautionary, because the author lays out some adverse effects of the proliferation of unregulated AI tools.

B. alarmist, because the passage discusses scenarios of the influence of new AI tools on language and human emotions.

C. quizzical, as the passage poses several questions, concluding with the question of whether or not the passage content has been generated by AI.

D. prescient, as the author analyses the future impact of the use of new AI tools on crucial areas of our society and culture.

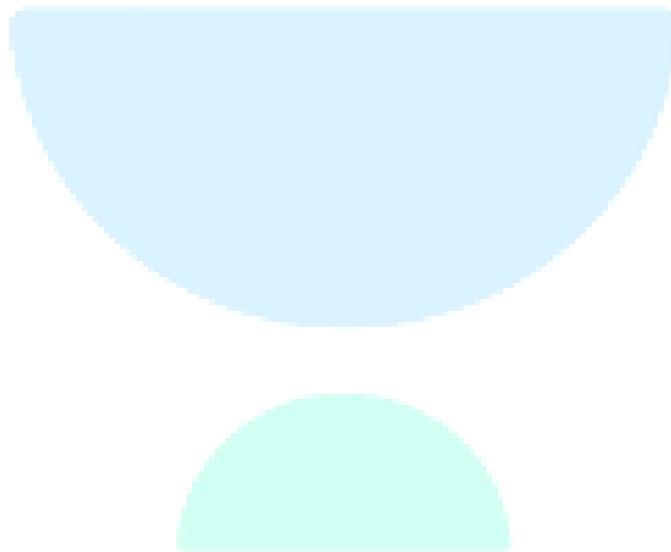
Answer Key: A

EASY

Q24. We can infer that the author is most likely to agree with which of the following statements?

- A. People's fears of the dangers of students using ChatGPT and other new AI tools are unfounded.
- B. Apart from its drawbacks, AI tools have been beneficial in boosting technological and industrial advance worldwide.
- C. The commonly expressed fear that future AI developments will fatally harm humans is unfounded.
- D. One of the biggest casualties from the spread of unregulated AI is likely to be the democratic process.

Answer Key: D



CAT 2024 Slot 3

QUANT

Topic: Arithmetic

Subtopic: Successive Percentage Change

Question Type: Numerical Based

Level of Difficulty: Moderate

Q1. After two successive increments, Gopal's salary became 187.5% of his initial salary. If the percentage of salary increase in the second increment was twice of that in the first increment, then the percentage of salary increase in the first increment was

- A. 20
- B. 25
- C. 27.5
- D. 30

Answer Key: B

Topic: Arithmetic

Subtopic: Compound Interest

Question Type: Numerical Based

Level of Difficulty: Moderate

Q2. Aman invests Rs 4000 in a bank at a certain rate of interest, compounded annually. If the ratio of the value of the investment after 3 years to the value of the investment after 5 years is 25 : 36, then the minimum number of years required for the value of the investment to exceed Rs 20000 is: (TITA)

Answer Key: 9

Topic: Arithmetic

Subtopic: Profit and Discount

Question Type: Numerical Based

Level of Difficulty: Easy

Q3. Gopi marks a price on a product in order to make 20% profit. Ravi gets 10% discount on this marked price, and thus saves Rs 15. Then, the profit, in rupees, made by Gopi by selling the product to Ravi, is

- A. 10
- B. 20
- C. 15
- D. 25

Answer Key: A

Topic: Arithmetic

Subtopic: Ratio and Proportion

Question Type: Numerical Based

Level of Difficulty: Moderate

Q4. Rajesh and Vimal own 20 hectares and 30 hectares of agricultural land, respectively, which are entirely covered by wheat and mustard crops. The cultivation area of wheat and mustard in the land owned by Vimal are in the ratio of 5: 3. If the total cultivation area of wheat and mustard are in the ratio 11: 9, then the ratio of cultivation area of wheat and mustard in the land owned by Rajesh is

- A. 4:3
- B. 3:7
- C. 1:1
- D. 7:9

Answer Key: D

Topic: Arithmetic

Subtopic: Mixtures and Alligation

Question Type: Numerical Based

Level of Difficulty: Moderate

Q5. A certain amount of water was poured into a 300 litre container and the remaining portion of the container was filled with milk. Then an amount of this solution was taken out from the container which was twice the volume of water that was earlier poured into it, and water was poured to refill the container again.

If the resulting solution contains 72% milk, then the amount of water, in litres, that was initially poured into the container was (TITA)

Answer Key: 30

Topic: Algebra

Subtopic: Arithmetic Mean and Linear Equations

Question Type: Concept Based

Level of Difficulty: Difficult

Q6. The average of three distinct real numbers is 28. If the smallest number is increased by 7 and the largest number is reduced by 10, the order of the numbers remains unchanged, and the new arithmetic mean becomes 2 more than the middle number, while the difference between the largest and the smallest numbers becomes 64. Then, the largest number in the original set of three numbers is (TITA)

Answer Key: 70

Topic: Algebra

Subtopic: Arithmetic Mean and Linear Equations

Question Type: Concept Based

Level of Difficulty: Difficult

Q7. Sam can complete a job in 20 days when working alone. Mohit is twice as fast as Sam and thrice as fast as Ayna in the same job. They undertake a job with an arrangement where Sam and Mohit work together on the first day, Sam and Ayna on the second day, Mohit and Ayna on the third day, and this three-day pattern is repeated till the work gets completed. Then, the fraction of total work done by Sam is

A. $\frac{3}{20}$

B. $\frac{3}{10}$

C. $\frac{1}{5}$

D. $\frac{1}{20}$

Answer Key: B

Topic: Arithmetic

Subtopic: Time, Speed and Distance

Question Type: Numerical Based

Level of Difficulty: Moderate

Q8. A train travelled a certain distance at a uniform speed. Had the speed been 6 km per hour more, it would have needed 4 hours less. Had the speed been 6 km per hour less, it would have needed 6 hours more. The distance, in km, travelled by the train is

- A. 800
- B. 720
- C. 780
- D. 640

Answer Key : B

Topic: Algebra

Subtopic: Exponential Equations

Question Type: Concept Based

Level of Difficulty: Moderate

Q9. The sum of all distinct real values of x that satisfy the equation $10^x + \frac{4}{10^x} = \frac{17}{2}$, is

- A. $2\log_{10} 2$
- B. $3\log_{10} 2$
- C. $4\log_{10} 2$
- D. $\log_{10} 2$

Answer Key: A

Topic: Algebra

Subtopic: Exponential Equations

Question Type: Concept Based

Level of Difficulty: Moderate

Q10. For some constant real numbers p, k and a, consider the following system of linear equations in x and y:

$$px - 4y = 2$$

$$3x + ky = a$$

A necessary condition for the system to have no solution for (x, y) is

A. $2a + k \neq 0$

B. $ap - 6 = 0$

C. $ap + 6 = 0$

D. $kp + 12 \neq 0$

Answer Key: A

Topic: Algebra

Subtopic: Surds

Question Type: Numerical Based

Level of Difficulty: Easy

Q11. If $(a + b\sqrt{3})^2 = 52 + 30\sqrt{3}$, where a and b are natural numbers, then a + b equals

A. 8

B. 10

C. 7

D. 9

Answer Key: A

Topic: Algebra

Subtopic: Modulus / Piecewise Functions

Question Type: Concept Based

Level of Difficulty: Moderate

Q12. The number of distinct real values of x, satisfying the equation $\max\{x, 2\} - \min\{x, 2\} = |x + 2| - |x - 2|$, is (TITA)

Answer Key: 2

Topic: Functions

Subtopic: Functional Equations

Question Type: Concept Based

Level of Difficulty: Difficult

Q13. For any non-zero real number x , let $f(x) + 2f\left(\frac{1}{x}\right) = 3x$. Then, the sum of all possible values of x for which $f(x) = 3$, is

- A. -2
- B. 3
- C. 2
- D. -3

Answer Key: D

Topic: Functions

Subtopic: Functional Equations

Question Type: Concept Based

Level of Difficulty: Difficult

Q14. If $3^a = 4, 4^b = 5, 5^c = 6, 6^d = 7, 7^e = 8$ and $8^f = 9$, then the value of the product $abcdef$ is (TITA)

Answer Key: 2

Topic: Algebra

Subtopic: Absolute Value Equations

Question Type: Concept Based

Level of Difficulty: Easy

Q15. The number of distinct integer solutions (x, y) of the equation $|x + y| + |x - y| = 2$, is (TITA)

Answer Key: 8

Topic: Algebra

Subtopic: Recurrence Relations / Sequences

Question Type: Concept Based

Level of Difficulty: Difficult

Q16. Consider the sequence $t_1 = 1, t_2 = -1$ and $t_n = \left(\frac{n-3}{n-1}\right)t_{n-2}$ for $n \geq 3$. Then, the value of the sum $\frac{1}{t_2} + \frac{1}{t_4} + \frac{1}{t_6} + \dots + \frac{1}{t_{2022}} + \frac{1}{t_{2024}}$, is

- A. -1022121
- B. -1026169
- C. -1024144
- D. -1023132

Answer key : C

Topic: Number System

Subtopic: Modular Arithmetic

Question Type: Numerical Based

Level of Difficulty: Easy

Q17. If 10^{68} is divided by 13, the remainder is

- A. 8
- B. 9
- C. 4
- D. 5

Answer Key: B

Topic: Arithmetic

Subtopic: Set Theory / Venn Diagram

Question Type: Numerical Based

Level of Difficulty: Difficult

Q18. In a group of 250 students, the percentage of girls was at least 44% and at most 60%. The rest of the students were boys. Each student opted for either swimming or running or both. If 50% of the boys and 80% of the girls opted for swimming while 70% of the boys and 60% of the girls opted for running, then the minimum and maximum possible number of students who opted for both swimming and running, are

- A. 75 and 96, respectively
- B. 75 and 90, respectively
- C. 72 and 88, respectively
- D. 72 and 80, respectively

Answer Key: D

Topic: Geometry

Subtopic: Medians and Area Ratios

Question Type: Concept Based

Level of Difficulty: Difficult

Q19. The midpoints of sides AB, BC, and AC in $\triangle ABC$ are M, N, and P, respectively. The medians drawn from A, B, and C intersect the line segments MP, MN and NP at X, Y, and Z, respectively. If the area of $\triangle ABC$ is 1440 sq cm, then the area, in sq cm, of $\triangle XYZ$ is (TITA)

Answer Key: 90

Topic: Geometry

Subtopic: Circle – Segment Area

Question Type: Numerical Based

Level of Difficulty: Moderate

Q20. A circular plot of land is divided into two regions by a chord of length $10\sqrt{3}$ meters such that the chord subtends an angle of 120° at the center. Then, the area, in square meters, of the smaller region is

A. $20\left(\frac{4\pi}{3} + \sqrt{3}\right)$

B. $20\left(\frac{4\pi}{3} - \sqrt{3}\right)$

C. $25\left(\frac{4\pi}{3} + \sqrt{3}\right)$

D. $25\left(\frac{4\pi}{3} - \sqrt{3}\right)$

Answer Key: D

Topic: Geometry

Subtopic: Circle – Segment Area

Question Type: Numerical Based

Level of Difficulty: Moderate

Q21. A regular octagon ABCDEFGH has sides of length 6 cm each. Then the area, in sq. cm, of the square ACEG is

A. $36(2 + \sqrt{2})$

B. $72(1 + \sqrt{2})$

C. $36(1 + \sqrt{2})$

D. $72(2 + \sqrt{2})$

Answer Key: A

Topic: Number System

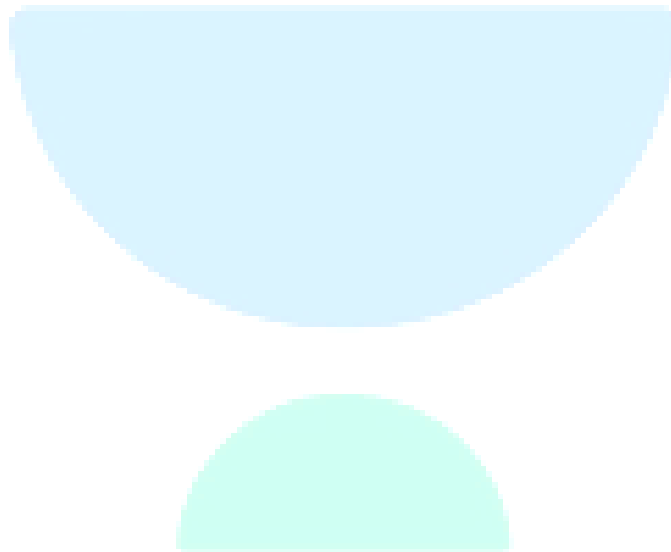
Subtopic: Permutations of Digits

Question Type: Numerical Based

Level of Difficulty: Moderate

Q22. The number of all positive integers up to 500 with non-repeating digits is (TITA)

Answer Key: 378



CAT 2024 Slot 3

LRDI

SET 1. Read the information given below and answer the question that follows:

The table given below shows the amount, in grams, of carbohydrate, protein, fat and all other nutrients, per 100 grams of nutrients in seven foodgrains. The first column shows the foodgrain category and the second column its codename. The table has some missing values.

Food grain Category	Codename of the food grain	Composition per hundred grams of nutrients in the food grains			
		Carbohydrate	Protein	Fat	Other nutrients
Cereal	C1			0	12
	C2			3	10
Millet	M1	62	10		
	M2			7	16
	M3	56		12	
Pseudo-cereal	P1	66			10
	P2		14		8

The following additional facts are known.

1. Both the pseudo-cereals had higher amounts of carbohydrate as well as higher amounts of protein than any millet.
2. Both the cereals had higher amounts of carbohydrate than any pseudo-cereal.
3. All the missing values of carbohydrate amounts (in grams) for all the foodgrains are non-zero multiples of 5.
4. All the missing values of protein, fat and other nutrients amounts (in grams) for all the foodgrains are non-zero multiples of 4.
5. P1 contained double the amount of protein that M3 contains.

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Medium**
- **Question Verification Status: Verified**

- **Select Goal:**
- **Answer Type: TITA**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Data Interpretation→ Table with missing values**

Q1. How many foodgrains had a higher amount of carbohydrate per 100 grams of nutrients than M1? (TITA)

Answer Key: 5

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Medium**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: TITA**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Data Interpretation→ Table with missing values**

Q2. How many grams of protein were there in 100 grams of nutrients in M2? (TITA)

Answer Key: 12

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Medium**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: TITA**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Data Interpretation → Table with missing values**

Q3. How many grams of other nutrients were there in 100 grams of nutrients in M3? (TITA)

Answer Key: 24

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Medium**

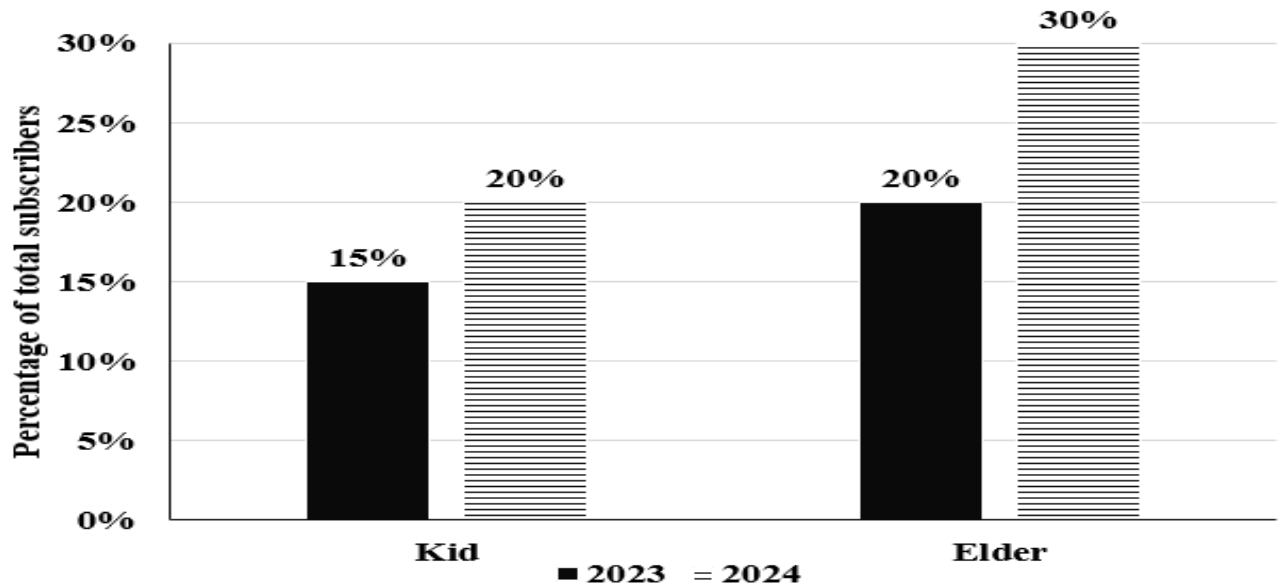
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: TITA**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Data Interpretation→ Table with missing values**

Q4. What is the median of the number of grams of protein in 100 grams of nutrients among these food grains? (TITA)

Answer Key: 12

SET 2. Read the information given below and answer the question that follows:

Over the top (OTT) subscribers of a platform are segregated into three categories: i) Kid, ii) Elder, and iii) Others. Some of the subscribers used one app and the others used multiple apps to access the platform. The figure below shows the percentage of the total number of subscribers in 2023 and 2024 who belong to the 'Kid' and 'Elder' categories.



The following additional facts are known about the numbers of subscribers.

1. The total number of subscribers increased by 10% from 2023 to 2024.
2. In 2024, $\frac{1}{2}$ of the subscribers from the 'Kid' category and $\frac{2}{3}$ of the subscribers from the 'Elder' category subscribers use one app.
3. In 2023, the number of subscribers from the 'Kid' category who used multiple apps was the same as the number of subscribers from the 'Elder' category who used one app.
4. 10,000 subscribers from the 'Kid' category used one app and 15,000 subscribers from the 'Elder' category used multiple apps in 2023.

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Medium**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: Single Choice**
- **Has Passage: True**
- **Language: English**

- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Data Interpretation→ Bar Charts**

Q5. How many subscribers belonged to the 'Others' category in 2024?

- A. Cannot be determined
- B. 65000
- C. 45000
- D. 55000

Answer Key: D

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Medium**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: Single Choice**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Data Interpretation→ Bar Charts**

Q6. What percentage of subscribers in the 'Kid' category used multiple apps in 2023?

- A. 33.33%
- B. 25.50%
- C. 50.00%
- D. 5.00%

Answer Key: A

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Medium**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: Single Choice**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Data Interpretation → Bar Charts**

Q7. What was the percentage increase in the number of subscribers in the 'Elder' category from 2023 to 2024?

- A. 60%
- B. 65%
- C. 40%
- D. 50%

Answer Key: B

- **Show Question in ATG: Yes**

- **Question Type: Concept-Based**
- **Question Difficulty: Medium**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: Single Choice**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Data Interpretation → Bar Charts**

Q8. What could be the minimum percentage of subscribers who used multiple apps in 2024?

- A. 16.5%
- B. 20.0%
- C. 10.0%
- D. 22.00%

Answer Key: B

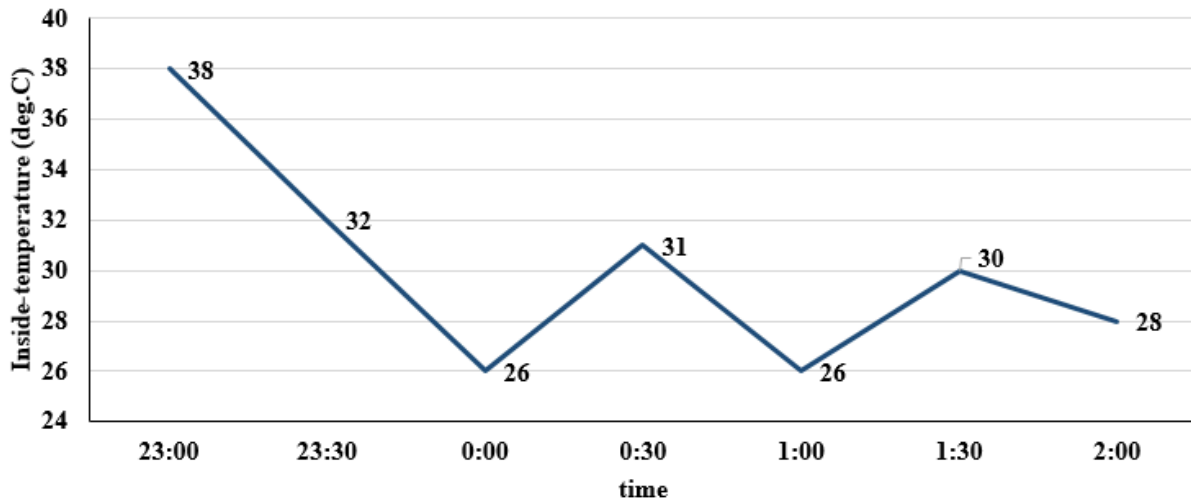
SET 3. Read the information given below and answer the question that follows:

The air-conditioner (AC) in a large room can be operated either in REGULAR mode or in POWER mode to reduce the temperature.

If the AC operates in REGULAR mode, then it brings down the temperature inside the room (called inside temperature) at a constant rate to the set temperature in 1 hour. If it operates in POWER mode, then this is achieved in 30 minutes.

If the AC is switched off, then the inside temperature rises at a constant rate so as to reach the temperature outside at the time of switching off in 1 hour.

The temperature outside has been falling at a constant rate from 7 pm onward until 3 am on a particular night. The following graph shows the inside temperature between 11 pm (23:00) and 2 am (2:00) that night.



The following facts are known about the AC operation that night.

- The AC was turned on for the first time that night at 11 pm (23:00).
- The AC setting was changed (including turning it on/off, and/or setting different temperatures) only at the beginning of the hour or at 30 minutes after the hour.
- The AC was used in POWER mode for longer duration than in REGULAR mode during this 3-hour period.

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Difficult**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: Single Choice**
- **Has Passage: True**
- **Language: English**

- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Data Interpretation→ Line Chart**

Q9. How many times the AC must have been turned off between 11:01 pm and 1:59 am?

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

Answer Key: B

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Difficult**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: TITA**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Data Interpretation→ Line Chart**

Q10. What was the temperature outside, in degree Celsius, at 1 am? (TITA)

Answer Key: 34

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Difficult**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: TITA**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Data Interpretation → Line Chart**

Q11. What was the temperature outside, in degree Celsius, at 9 pm? (TITA)
Answer Key: 42

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Difficult**
- **Question Verification Status: Verified**
- **Select Goal:**

- **Answer Type: Single Choice**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Data Interpretation→ Line Chart**

Q12. What best can be concluded about the number of times the AC must have either been turned on or the AC temperature setting been altered between 11:01 pm and 1:59 am?

- A. More than 3
- B. Exactly 2
- C. Either 2 or 3
- D. Exactly 3

Answer Key: D

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Difficult**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: Single Choice**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**

- **Tag Syllabus: Data Interpretation→ Line Chart**

Q13. What was the maximum difference between temperature outside and inside temperature, in degree Celsius, between 11:01 pm and 1:59 am? (TITA)

Answer Key: 10

SET 4. Read the information given below and answer the question that follows:

Out of 10 countries -- Country 1 through Country 10 -- Country 9 has the highest gross domestic product (GDP), and Country 10 has the highest GDP per capita. GDP per capita is the GDP of a country divided by its population. The table below provides the following data about Country 1 through Country 8 for the year 2024.

- Column 1 gives the country's identity.
- Column 2 gives the country's GDP as a fraction of the GDP of Country 9.
- Column 3 gives the country's GDP per capita as a fraction of the GDP per capita of Country 10.
- Column 4 gives the country's annual GDP growth rate.
- Column 5 gives the country's annual population growth rate.

Country	GDP	GDP per capita	GDP growth rate	Population growth rate
Country 1	0.15	0.41	0.2%	-0.12%
Country 2	0.14	0.25	0.9%	-0.41%
Country 3	0.13	0.02	6.5%	0.70%
Country 4	0.12	0.38	0.5%	0.49%
Country 5	0.1	0.36	0.7%	0.31%
Country 6	0.08	0.08	3.2%	0.61%
Country 7	0.08	0.3	0.7%	-0.11%
Country 8	0.07	0.41	1.2%	0.71%

Assume that the GDP growth rates and population growth rates of the countries will remain constant for the next three years.

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Difficult**
- **Question Verification Status: Verified**

- **Select Goal:**
- **Answer Type: Single Choice**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Logical Reasoning → Quantitative Reasoning**

Q14. Which one among the countries 1 through 8, has the smallest population in 2024?

- A. Country 3
- B. Country 5
- C. Country 8
- D. Country 7

Answer Key: C

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Difficult**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: Single Choice**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**

- **Tag Syllabus: Logical Reasoning→ Quantitative Reasoning**

Q15. The ratio of Country 4's GDP to Country 5's GDP in 2026 will be closest to

- A. 1.032
- B. 1.314
- C. 0.963
- D. 1.195

Answer Key: D

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Difficult**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: Single Choice**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Logical Reasoning→ Quantitative Reasoning**

Q16. Which one among the countries 1, 4, 5, and 7 will have the largest population in 2027?

- A. Country 4
- B. Country 7
- C. Country 1
- D. Country 5

Answer Key: C

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Difficult**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: TITA**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Logical Reasoning → Quantitative Reasoning**

Q17. For how many countries among Country 1 through Country 8 will the GDP per capita in 2027 be lower than that in 2024? (TITA)

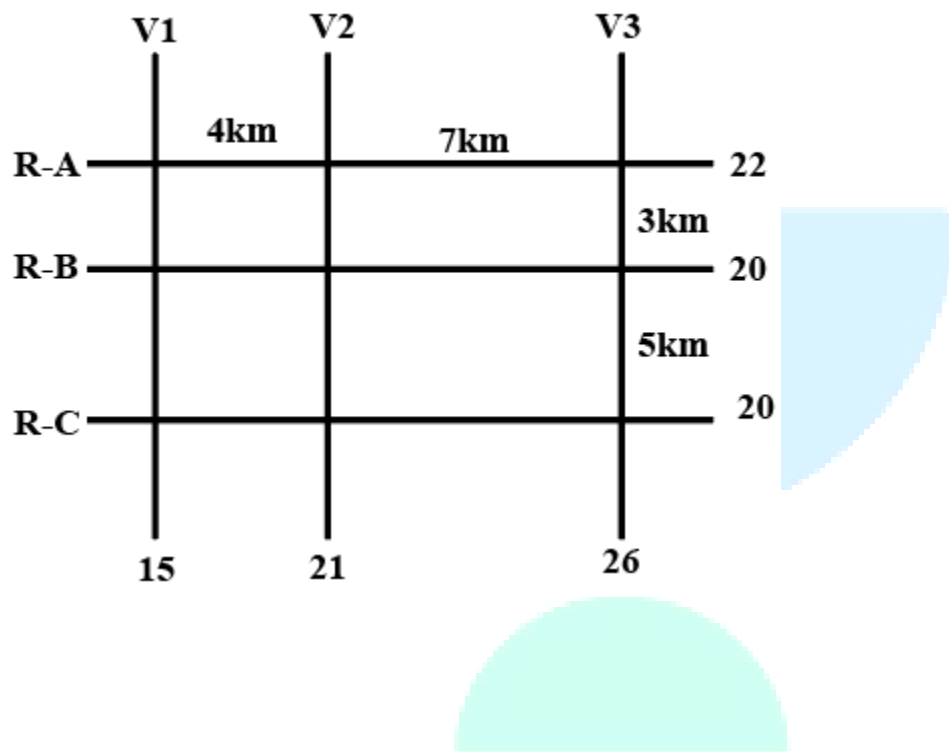
Answer Key: 0

SET 5. Read the information given below and answer the question that follows

The figure below shows a network with three parallel roads represented by horizontal lines R-A, R-B, and R-C and another three parallel roads represented by vertical lines V1, V2, and V3. The figure also shows the distance (in km) between two adjacent intersections. Six ATMs are placed at six of the nine road intersections. Each ATM has a distinct integer cash requirement (in Rs. Lakhs), and the numbers at the end of each line in the figure indicate the total cash requirements of all ATMs placed on the corresponding road. For example, the total cash requirement of the ATM(s) placed on road R-A is Rs. 22 Lakhs.

The following additional information is known.

1. The ATMs with the minimum and maximum cash requirements of Rs. 7 Lakhs and Rs. 15 Lakhs are placed on the same road.
2. The road distance between the ATM with the second highest cash requirement and the ATM located at the intersection of R-C and V3 is 12 km.



- Show Question in ATG: Yes
- Question Type: Concept-Based
- Question Difficulty: Medium
- Question Verification Status: Verified
- Select Goal:
- Answer Type: Single Choice
- Has Passage: True

- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Logical Reasoning→ Routes and Network**

Q18. Which of the following statements is correct?

- A. The ATM placed at the (R-C, V2) intersection has a cash requirement of Rs. 9 Lakhs.
- B. There is no ATM placed at the (R-C, V2) intersection.
- C. The ATM placed at the (R-C, V2) intersection has a cash requirement of Rs. 8 Lakhs.
- D. The cash requirement of the ATM placed at the (R-C, V2) intersection cannot be uniquely determined.

Answer Key: A

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Medium**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: TITA**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Logical Reasoning→ Routes and Network**

Q19. How many ATMs have cash requirements of Rs. 10 Lakhs or more? (TITA)
Answer Key: 3

- **Show Question in ATG: Yes**
- **Question Type: Concept-Based**
- **Question Difficulty: Medium**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: Single Choice**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Logical Reasoning → Routes and Network**

Q20. Which of the following two statements is/are DEFINITELY true?

Statement A: Each of R-A, R-B, and R-C has two ATMs.

Statement B: Each of V1, V2, and V3 has two ATMs.

- A. Both Statement A and Statement B
- B. Neither Statement A nor Statement B
- C. Only Statement A
- D. Only Statement B

Answer Key: C

- **Show Question in ATG: Yes**

- **Question Type: Concept-Based**
- **Question Difficulty: Medium**
- **Question Verification Status: Verified**
- **Select Goal:**
- **Answer Type: Single Choice**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Logical Reasoning → Routes and Network**

Q21. What best can be said about the road distance (in km) between the ATMs having the second highest and the second lowest cash requirements?

- A. 7 km
- B. 5 km
- C. 4 km
- D. Either 4 km or 7 km

Answer Key: D

- **Show Question in ATG: Yes** · **Question Difficulty: Medium**
- **Question Type: Concept-Based**
- **Question Verification Status: Verified**
- **Select Goal:**

- **Answer Type: TITA**
- **Has Passage: True**
- **Language: English**
- **Previous Year Question (PYQ): True**
- **Has Equation: False**
- **Tag Syllabus: Logical Reasoning → Routes and Network**

Q22. What is the number of ATMs whose locations and cash requirements can both be uniquely determined? (TITA)

Answer Key: 3

