CAT 2024 Slot – 1 VARC

Direction for question 1 to 4: 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-snooted 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 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 Pedler'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.

1. Which one of the following statements provides a gist of this passage?
a) The onslaught of animals, such as cattle, rabbits and housecats, brought in by the British led to the extinction of the western barred bandicoot.
b) Marsupials are going extinct due to the colonial era transformation of the ecosystem which also destroyed natural vegetation.
c) A type of bandicoots was nearly wiped out by invasive species but rescuers now pin hopes on a remnant island population.
d) The negligent attitude of the British colonists towards these bandicoots evidenced by the names given to them led to their annihilation.

2. The text uses the word 'exclosures' because Wild Deserts has adopted a measure of
a) restoring cattle damaged deserts to green landscapes.
b) excluding animals to make the islands predator-free.
c) barring the entry of invasive species.
d) ridding the main desert of feral cats and large bilbies.

3. 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) Long thin nose, black striped back, pouch for joeys
d) Look of a rat but with a baby pouch and a slender snout

4. According to the text, the western barred bandicoots now have a flattering name because they have
a) aided in altering an arid environment.
b) grown fivefold in terms of population.
c) led to a surge and increase of rainfall.
d) led a revival in preserving the species.

5. 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 3
b) Option 1
c) Option 2
d) Option 4

Direction for question 6 to 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.

6. 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.

7. "Times have changed for the once almighty discipline." We can infer from this statement and the associated paragraph that the author is being
a) disparaging of economists' inability to precisely predict market behaviour, and are now borrowing from other disciplines to remedy this.
b) sarcastic about how economists, who earlier shunned other disciplines, are now beginning to incorporate them in their analyses.
c) critical of economists' openly borrowing and collaborating across disciplines to explain how humans make decisions.
d) judgemental about the ability of economic tools to accurately manage crises leading to the downfall of this lofty science.

8. We can infer from the passage that the term "homo economicus" refers to someone who
a) maximises their opportunities based on nonmarket choices.
b) believes in borrowing and collaborating with other disciplines in their work.
c) makes rational decisions based on their own preferences.
d) is not influenced by the preferences and choices of others.

9. In the first paragraph the author is making the point that economists like Becker
a) used economics to analyse non-market behaviour, without incorporating perspectives from other areas of inquiry.
b) tended to guard their discipline from poaching by academics from other subject areas.
c) benefitted from the application of their principles and concepts to non-economic phenomena.
d) had begun to borrow concepts from other disciplines but were averse to the latter applying economic principles.

10. 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.
a) Option 4
b) Option 2

c) Option 1
d) Option 3

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

12. 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. Animals have an interest in fulfilling their basic needs, but also in avoiding suffering, and thus we ought to extend moral consideration.
2. Singer viewed himself as a utilitarian, and presents a direct moral theory concerning animal rights, in contrast to indirect positions, such as welfarist views.
3. He argued for extending moral consideration to animals because, similar to humans, animals have certain significant interests.
4. The event that publicly announced animal rights as a legitimate issue within contemporary philosophy was Peter Singer's Animal Liberation text in 1975.
5. As such, we ought to view their interests alongside and equal to human interests, which results in humans having direct moral duties towards animals

13. 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) 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.
c) 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.
d) Learning linguistic and visual signs at an early age makes all such codes appear natural. This naturalization of codes is the effect of ideology.

Direction for question 14 to 17: 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 sisyphean 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 heatwave 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 alight themselves if it'll help next quarter's numbers.

14. 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.

15. "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.

16. 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 counterintuitively likely to be made more difficult by the rapid churn in technology and the whims of host platforms.

17. 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.

Direction for question 18 to 21: The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

... [T]he 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 19th 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.

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

a) discouraged innovation by restricting entry through strict rules.
b) did not always employ egalitarian production processes.
c) did not necessarily promote creativity.
d) focused excessively on product quality.

19. 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.

20. The author questions the ability of crafts to create substantial employment opportunities presently because
a) the low scale of crafts production will not be able to absorb the mass of redundant labour.
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) crafts guilds tend to resist new entrants and are unlikely to accept large numbers of
trainees.

21. The most recent revival in interest in the crafts is a result of the emergence of all of the following EXCEPT:
a) a niche market for discerning buyers of quality products.
b) support for individual creations as opposed to mass-produced objects.
c) a greater interest in buying locally produced goods.
d) concerns about the environmental impact of mass production.

22. 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 I. __(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. . Extreme 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

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

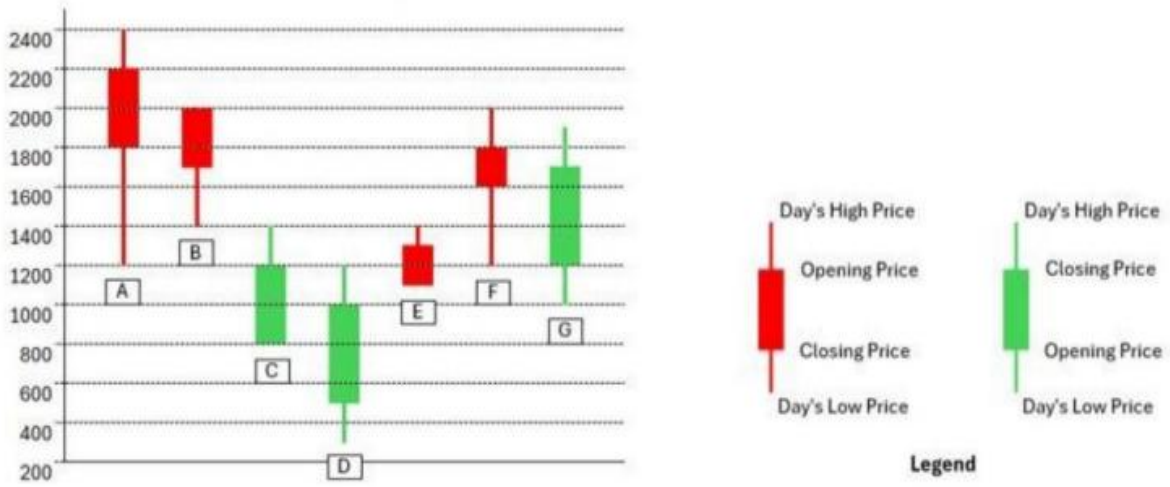
Cartographers design and create maps to communicate information about phenomena located somewhere on our planet. In the past, cartographers did not worry too much about who was going to read their maps. Although some simple "usability" research was done-like comparing whether circle or bar symbols worked 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) New technological developments have prompted cartographers to experiment with their maps by applying these new innovations.
b) Today, cartographers also need to look into the usability of maps because of the new technological developments.
c) Maps are being used for a variety of reasons and therefore map readers have become more demanding.
d) Modern mapmakers evaluate a map's effectiveness efficiency and satisfaction of the user through a series of experiments.

24. 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, videoconferencing, 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.

CAT 2024 Slot – 1 DILR

Directions for question 1 to 4:
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.



1. 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) F
b) A
c) C
d) D

2. 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?

3. 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) F
b) B
c) A
d) G

4. 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) 72%
b) 80%
c) 50%
d) 100%

Directions for question 5 to 9:
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 × (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.

5. 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%

6. What is the minimum percentage of students who will vote in the election?
a) 36%
b) 38%
c) 32%
d) 40%

7. If Amiya runs a campaign focusing on issues, then what is the maximum percentage of votes that she can get?
a) 44%
b) 40%
c) 48%
d) 36%

8. If Ramya runs a campaign attacking Amiya, then what is the minimum percentage of votes that she is guaranteed to get?
a) 15%
b) 30%
c) 12%
d) 18%

9. What is the maximum possible voting margin with which one of the candidates can win?
a) 29%
b) 26%
c) 20%
d) 28%

Directions for question 10 to 14:

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.

10. How many rounds were there in the tournament?

11. What is the number of the team that played Team 1 in Round 5?

12. Which team among the teams numbered 2, 3, 4, and 5 was not part of the same group?
a) 3
b) 2
c) 4
d) 5

13. What is the number of the team that played Team 1 in Round 7?

14. What is the number of the team that played Team 6 in Round 3?

Directions for question 15 to 18:

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.

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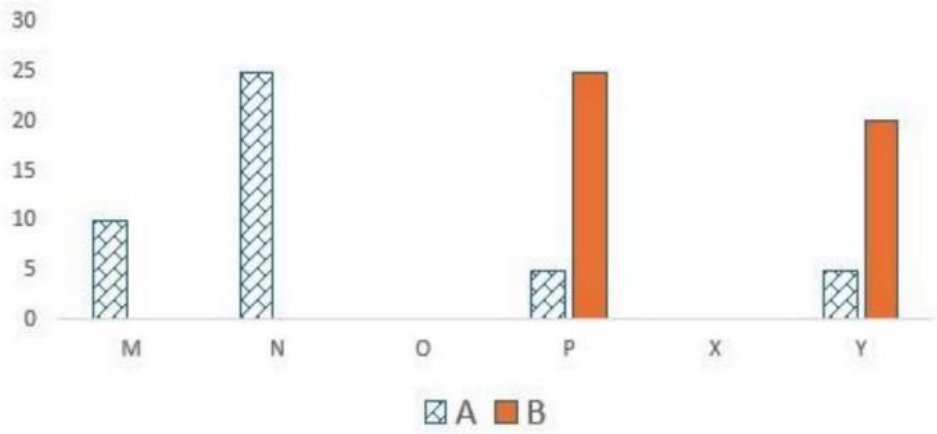
No. of stars received by Bloggers A and B



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.

15. What was the total number of stars received by D?

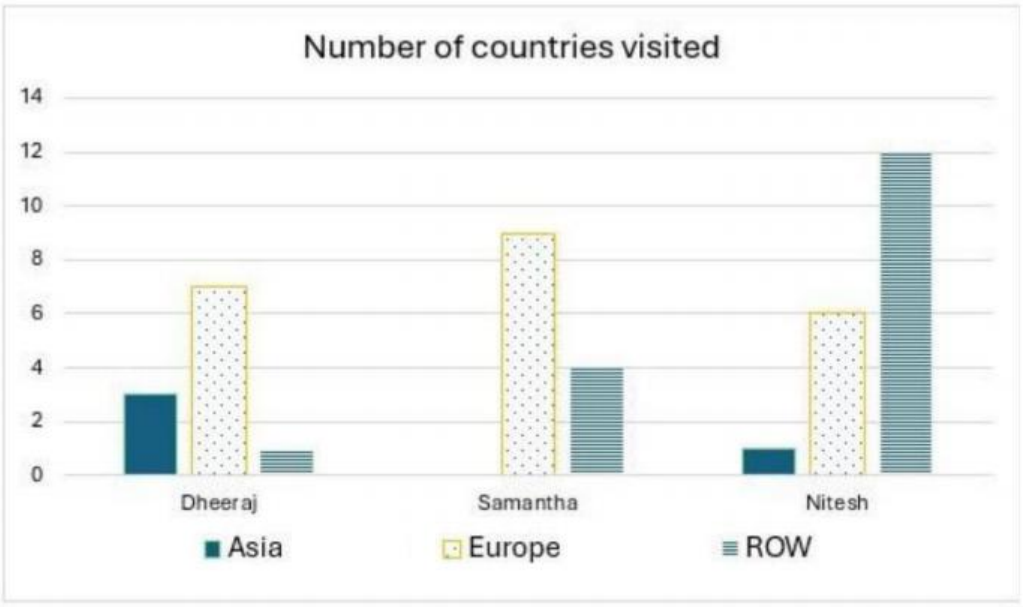
16. What was the number of stars received by D from Y?
a) cannot be determined
b) 5
c) 0
d) 10

17. How many surfers distributed their stars among exactly 2 bloggers?

18. 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) Only I
b) Both I and II
c) Only II
d) Neither I nor II

Directions for question 19 to 22:

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).



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.

19. How many countries in Asia were visited by at least one of Dheeraj, Samantha and Nitesh?

20. How many countries in Europe were visited only by Nitesh?

21. How many countries in the ROW were visited by both Nitesh and Samantha?

22. How many countries in Europe were visited by exactly one of Dheeraj, Samantha and Nitesh?
a) 10
b) 12
c) 5
d) 14

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CAT 2024 Slot – 1 Quant

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

a) π
b) 2π
c) 4π
d) 3π

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

a) $\frac{4}{3}$
b) $-\frac{4}{3}$
c) $\frac{2}{3}$
d) $-\frac{2}{3}$

3. 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

4. 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

5. For any natural number n, let a_n be the largest integer not exceeding $\sqrt{n}$. Then the value of $a_1 + a_2 + \ldots\ldots + a_{50}$ is

6. 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) 750π
b) 1125π √2
c) 1125 π
d) 750 π √2

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

8. 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) 22
b) 4
c) 6

d) 18

9. 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) 50
b) 18
c) 42
d) 36

10. 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) 1
b) 3
c) 4
d) $1\frac{1}{3}$

11. 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 *b* 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) 665
b) 667
c) 537
d) 540

12. 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) 20
b) 15
c) 14
d) 10

13. 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

14. 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) 6
b) 4
c) 3
d) 5

15. 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 number of unsold apples to number of unsold oranges becomes 3: 2. The total number of unsold fruits is

16. ABCD is a rectangle with sides AB = 56 cm and BC = 45 cm, and E is the midpoint of side CD. Then, the length, in cm, of radius of in circle of ΔADE is

17. 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

18. 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 remains unchanged while their incomes increase 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) 15.18
b) 13.26
c) 12.75
d) 14.84

19. Suppose $x_1, x_2, x_3, \ldots, x_{13}$ are in arithmetic progression such that $x_5 = -4$ and $2x_6 + 2x_9 = x_{11} + x_{13}$. Then, x_{100} equals

a) −196
b) 206
c) 204
d) -194

20. 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

21. 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) 18
b) 14
c) 12

d) 16

22. When 10_{100} is divided by 7, the remainder is
a) 1
b) 3
c) 4
d) 6

QUANTIFIERS CAT ACADEMY

Solutions:

VARC

1. Correct Answer: C

This is a "gist" or "central idea" question — the best answer must capture the overall arc of the passage without being too narrow, too broad, or factually distorted.

Option C is correct because it neatly encapsulates the three-act story of the passage: a species of bandicoot nearly wiped out by invasive species → a small island population survived → conservationists are now using that remnant population to attempt a mainland revival. This is precisely what the passage is about from beginning to end. The word "rescuers" captures the Wild Deserts effort, "remnant island population" refers to the Shark Bay survivors, and "hopes" honestly reflects the uncertainty still surrounding the project. Nothing is overstated or left out.

Option A is too narrow and factually off. It focuses only on the colonial-era destruction and even overstates it by implying full extinction — but the bandicoot wasn't wiped out entirely; Shark Bay populations survived. More importantly, the revival effort, which is the heart of the passage's second half, is completely ignored here.

Option D is a distortion. The passage does mention the dismissive names colonists gave the bandicoot, but this is merely the opening hook — it had no causal role in the bandicoot's decline. Blaming the "negligent attitude" and "names given" for their annihilation is a misreading of the passage's intent.

Option B goes too broad in two ways — it generalizes to "all marsupials" and to "natural vegetation," neither of which is the central focus. The passage is specifically about the western barred bandicoot, not marsupials as a class. Broad generalizations never make good gist answers.

2. Correct Answer: C

This question tests vocabulary-in-context — specifically, why the author chose the word "exclosures" rather than "enclosures." The key insight is that an exclosure is a fenced area designed to keep certain animals out, as opposed to an enclosure which keeps animals in.

Option C is correct because it captures this precise meaning. The passage explicitly tells us that the two fenced exclosures were cleared of invasive rabbits and feral cats — in other words, these species were barred from entering. The word "exclosures" is a deliberate play on "enclosures," signaling that the purpose of the fencing is exclusion of invasive species, which is exactly what option C states.
Option B is incorrect on a factual ground — it says the exclosures are on islands, but the passage clearly places them on the mainland, on the edge of the Strzelecki Desert in New South Wales. The predator-free islands are Shark Bay, which existed long before Wild Deserts intervened.
Option D is partially true in that feral cats were indeed excluded, but it goes wrong by mentioning "large bilbies." Bilbies are actually present inside the Wild Training Zone — they are not barred but rather deliberately kept there for predator-training

purposes. Mixing up what is excluded with what is included makes this option incorrect.

Option A gets the cause and effect backwards. While the bandicoots' digging does help restore the cattle-damaged desert, that is a byproduct of their presence, not the purpose of the exclosures. The exclosures exist to keep invasive species out, not to directly restore the landscape.

QUANTIFIERS CAT ACADEMY

3. Correct Answer: B

This is a "detail elimination" question — three options will accurately reflect characteristics mentioned in the passage, and one will either distort, exaggerate, or combine details inaccurately. The task is to identify that one. Option B is the answer because it subtly misrepresents the passage. The passage calls the western barred bandicoot the "smallest bandicoot," not the "smallest black-striped marsupial." These are two very different claims. The black stripes are mentioned only as a physical feature of its rump — the reason colonists nicknamed it the "zebra rat" — not as a defining classification trait. By combining "smallest," "black-striped," and "marsupial" into one descriptor, this option creates a characterization that the passage never makes. It reads as accurate at first glance, which is precisely what makes it a good trap option. Option A is accurately supported. The passage mentions the bandicoot's long snout ("slender-snooted") and its habit of digging "shallow, camouflaged shelters." Elongated muzzle and shallow digging are both directly described. Option C is also well-supported. The long thin nose corresponds to "slender-snooted," the black-striped back is referenced through the "zebra rat" nickname, and the pouch for joeys is explicitly described in the passage — notably as a backward-facing pouch. Option D holds up too. The "zebra rat" nickname directly evokes a rat-like appearance, the slender snout is mentioned in the opening lines, and the backward-facing pouch for carrying breath-mint-size babies is a key detail from the passage. All three elements check out.

4. Correct Answer: A

This question tests your ability to locate a specific detail in the passage and understand the reasoning behind it. The "flattering nickname" referred to is "ecosystem engineers," and the question asks why they earned it.

Option A is correct because the passage directly links this nickname to the bandicoots' environmental impact — specifically their constant digging, which traps moisture and allows seed germination, helping the cattle-damaged desert restore itself. This is precisely what "altering an arid environment" means. The nickname is a recognition of their role in actively transforming and rehabilitating the desert landscape.

Option B is incorrect because while the population did grow from 20 to about 100, this fivefold increase is never connected to the nickname in the passage. Population growth is a sign of the revival's success, but it has nothing to do with why they are called ecosystem engineers.

Option C gets the cause and effect backwards. The passage says a surge of rainfall led to a joey boom, meaning rainfall caused population growth — the bandicoots did not cause the rainfall. Attributing the rainfall surge to the bandicoots is a clear reversal of what the passage states.

Option D is tempting because the bandicoots are indeed central to the species revival effort, but the passage is specific — the nickname "ecosystem engineers" is earned because of what they do to the environment around them, not because they helped preserve their own species. Species preservation is the goal of the conservationists, not a trait of the bandicoots themselves.

5. Correct Answer: D

This is a sentence insertion question that tests your understanding of logical flow and coherence within a paragraph. The key is to find where the given sentence connects most naturally with the surrounding ideas — both what comes before and after it.

Option 4 is correct because the sentence immediately before blank 4 describes the Silk Roads as "the world's central nervous system, connecting otherwise far-flung peoples and places." The sentence to be inserted — about understanding Central Asia's role helping developments make sense across Asia, Europe, the Americas and Africa — is a direct and natural extension of this idea. It expands on the global connectivity just described. Further, the sentence that follows blank 4 begins with "It allows us to see patterns and links, causes and effects..." — the word "It" here is a pronoun that refers back to "understanding Central Asia's role," which confirms that our sentence must immediately precede it. This before-and-after fit makes position 4 the only logical choice.

Option 1 is incorrect because at that point the paragraph is still introducing the idea that Silk Roads nations are historically significant civilizations, not yet discussing their global connectivity. Inserting a sentence about worldwide implications here would feel premature and abrupt.

Option 2 is incorrect because the paragraph at that stage is focused on the specific historical functions of the Silk Roads — the movement of pilgrims, merchants, goods and ideas. The inserted sentence operates at a much broader, analytical level and would disrupt the descriptive flow at this point.

Option 3 is incorrect because the surrounding text there deals with the dual nature of the Silk Roads — carrying both prosperity and death. The inserted sentence has no thematic connection to this idea of destruction or hardship, making it a jarring and illogical fit at that position.

6. Correct Answer: B

This question tests your ability to accurately identify the author's specific critique of Shiller's work. The relevant portion is in the final paragraph, so reading it carefully is essential.

Option B is correct because the passage states that Shiller "completes a circle" connecting perceptions to behavior to social outcomes, but the author's criticism is that this cycle was once "mediated or dominated by institutions" — political parties, lobby groups, and media organizations — and that Shiller has stripped these institutions from his account. What remains is a "bare dynamic of emotions and economics, without the intermediating place of politics." This is precisely what option B captures — Shiller links emotions and behavior without accounting for the mediating role of social institutions.

Option A is incorrect because it says Shiller "denigrates" institutions, which implies he actively dismisses or attacks them. The author's critique is subtler — Shiller simply omits or strips away institutions from his framework. There is a meaningful difference between ignoring something and denigrating it.

Option C gets the logic backwards. The author does not consider media and politics to be marginal — quite the opposite. The passage presents them as vital intermediaries that legitimize, represent, and exclude interests. The criticism is

that Shiller treats them as marginal by leaving them out, but the author himself sees them as central.

Option D misidentifies the target of the critique. The author does not fault Shiller for relying too heavily on storytelling. In fact, bringing in storytelling to frame perceptions is presented as something Shiller does well. The problem lies in what comes next — the absence of institutions in explaining how those perceptions translate into social outcomes.

7. Correct Answer: B

This question tests your ability to identify the author's tone and intent behind a specific statement. The phrase "once almighty discipline" is the key — it signals that the author is being ironic or sarcastic, looking back at economics' former air of superiority.

Option B is correct because the paragraph that follows the statement gives us clear evidence of the author's sarcastic tone. The earlier paragraph describes Gary Becker as a "picture of the imperial economist in the heyday of the discipline's bravura" — economists who invaded other fields without letting outside thinking into their own. The statement "times have changed" then ironically notes that these same economists, who once looked down on other disciplines, are now borrowing from historians, psychologists, and social scientists. The author is not celebrating this change with genuine admiration — the use of words like "imperial," "bravura," and "almighty" reveals a wry, sarcastic undercurrent throughout.

Option A is incorrect because the author is not specifically disparaging economists for failing to predict market behaviour. The focus of the paragraph is on economists' interdisciplinary attitudes, not their forecasting failures. Importing that idea here goes beyond what the text supports.

Option C is incorrect because it flips the author's position entirely. The author is not criticising economists for borrowing from other disciplines — if anything, the passage treats this openness as a positive development. The sarcasm is directed at their former arrogance, not their current collaboration.

Option D is too narrow and introduces an idea not present in this part of the passage. The author is not making a judgement about economics failing to manage crises — that theme does not appear in the paragraph associated with this statement. The focus is squarely on attitude and approach, not crisis management.

8. Correct Answer: C

This question tests your ability to infer the meaning of a specific term from its context within the passage. The term "homo economicus" appears twice in the passage, and both instances give us enough context to understand what it means.

Option C is correct because the passage gives us a direct and clear description of what homo economicus represents. In the third paragraph, the author explains the classical economic assumption that people have "preferences" which get revealed through their choices — if you are hungry, you buy lunch; if you are cold, you get a sweater. This is the behaviour of homo economicus — a person who identifies their own needs and preferences and makes rational, calculated decisions to maximise their utility. The passage also refers to homo economicus as a "textbook

maximizer," further confirming that rational decision-making based on individual preferences is the defining trait.

Option A is incorrect because homo economicus is specifically associated with market-like, rational decision-making. Nonmarket choices are actually the domain that Becker tried to extend economics into — they are not what defines homo economicus itself. This option confuses the subject with the territory it was applied to.

Option B is entirely off track. Borrowing and collaborating across disciplines is what the newer generation of economists like Piketty and behavioral economists do — it is actually the opposite of the closed, self-contained worldview that homo economicus represents. This option describes the antithesis of the concept.

Option D is too narrow in its framing. While homo economicus does make decisions based on individual preferences, the concept is not specifically about being uninfluenced by others — it is about rationality and preference-based maximisation. Reducing it only to isolation from others' choices misses the broader and more essential meaning of the term.

9. Correct Answer: A

This question tests your ability to accurately summarise the author's characterisation of Becker's approach in the first paragraph. The paragraph presents a very specific two-sided picture — what Becker did and what he deliberately did not do.

Option A is correct because it precisely captures both sides of Becker's approach as described in the passage. On one hand, Becker "projected economics outward" — he applied economic methods to non-market domains like crime, domesticity, and spouse selection. On the other hand, "he did not let other ways of thinking enter his own economic realm" — he refused to borrow from anthropology, history, or any nonmarket observations. This one-way expansion, going out but not letting anything in, is exactly what option A describes, and it is also what the author means by calling Becker "a picture of the imperial economist."

Option B is incorrect because "guarding the discipline from poaching" suggests a defensive posture — protecting economics from outsiders trying to take something from it. But the author's point is different. Becker was not defensive so much as he was closed-minded and unwilling to integrate outside perspectives. The metaphor in the passage is of invasion, not protection.

Option C is incorrect because it frames Becker's approach as beneficial, suggesting he gained from applying economics to non-economic phenomena. The passage does not present this as a positive outcome — the tone is critical, describing Becker's one-sidedness as a limitation and a symptom of economics' imperial arrogance, not an achievement to be celebrated.

Option D is the most tempting wrong answer but is directly contradicted by the passage. The passage explicitly states that Becker did not borrow from other disciplines — so saying he "had begun to borrow" is factually inaccurate. The entire point of the first paragraph is that the borrowing was completely one-directional.

10. Correct Answer: C

This is a sentence insertion question that tests your understanding of paragraph structure and logical flow. The inserted sentence uses a relatable analogy — a home office or medicine cabinet — to set up the idea that the brain is not neatly or intuitively organised. The key is to find where this sentence best introduces or anchors the paragraph.

Option 1 is correct because the inserted sentence works perfectly as an opening line. It introduces the central analogy that the rest of the paragraph builds upon — the contrast between organised, human-designed systems and the brain's haphazard, evolved architecture. The very next sentence, "You can't just put things anywhere you want to," flows naturally from this opening, reinforcing the idea that the brain defies the kind of deliberate organisation we apply to our personal spaces. Starting with a familiar, relatable image draws the reader in and prepares them for the more technical explanation that follows.

Option 2 is incorrect because by that point the paragraph has already moved into describing the brain's evolved architecture and multiple systems. Inserting the home office analogy here would interrupt the flow of a thought that is already well underway and create an awkward shift backwards in logic.

Option 3 is incorrect because the surrounding text at that position is focused on the absence of a grand planner in the brain's design. The inserted sentence is more introductory and analogical in nature — it does not connect logically to the specific point being made about evolutionary design at that stage of the paragraph.

Option 4 is incorrect because the paragraph ends on a strong, vivid metaphor — the brain as a "big, old house with piecemeal renovations." This is a powerful concluding image and placing the inserted sentence after it would dilute its impact and create an anticlimactic ending. Strong paragraph closers should never be followed by introductory-style sentences.

QUANTIFIERS CAT ACADEMY

11. Correct Answer: B

This is a summary question, which means the correct answer must capture the central idea of the passage — not just a detail, not an overgeneralization, and not a distortion of the author's reasoning. A good summary reflects both what the passage says and why it says so.

Option B is correct because it captures the passage's core argument most completely. The passage does not merely list animal abilities — it builds toward a specific explanatory point. After describing animals' sensory abilities and emotional range, the passage concludes by explaining why animals share emotions with humans — because they share brain structures in the limbic system. Option B is the only answer that includes this causal link between shared brain structure and shared emotions, which is the passage's concluding and most important insight.

Option C is incomplete because while it correctly notes that animals display human-like emotions, it stops there without explaining why. A summary that omits the passage's central explanatory point — the shared limbic system — is only telling half the story and therefore cannot be the best summary.

Option A introduces a causal link that the passage never makes. The passage mentions sensory and motor abilities as examples of animal intelligence, but it never connects these abilities to animals' emotional range. Attributing emotions to sensory and motor skills is a logical leap that the passage does not support.

Option D is too narrow because it focuses only on animals detecting diseases and sensing danger, which are mentioned in the opening lines as supporting examples. These details are not the main point of the passage — they are merely illustrations of animal intelligence before the passage moves on to its broader argument about emotions and brain structure.

12. Correct Answer: 1

This is a parajumble odd-sentence-out question. The task is to identify which sentence does not logically belong with the other four. The key is to find the four sentences that form a coherent, connected paragraph and isolate the one that disrupts the flow or introduces an unrelated idea.

The four sentences that fit together are 2, 3, 4, and 5. Sentence 4 provides the historical anchor — it tells us that Peter Singer's Animal Liberation (1975) was the event that brought animal rights into mainstream philosophical discussion. Sentence 2 then establishes Singer's philosophical identity as a utilitarian and contrasts his direct moral theory with indirect positions like welfarism. Sentence 3 builds further by explaining Singer's specific argument — that animals, like humans, have significant interests that warrant moral consideration. Sentence 5 then completes the logical chain by concluding that these animal interests must be treated as equal to human interests, resulting in direct moral duties towards animals. Together, these four sentences form a tight, well-structured paragraph about Singer's philosophy and its historical significance.

Sentence 1 is the odd one out because it makes a broad, general claim about animals having interests in fulfilling basic needs and avoiding suffering. While this idea is thematically related to animal rights, it does not connect specifically to Singer's utilitarian framework, his Animal Liberation text, or the philosophical

argument developed in sentences 2, 3, 4, and 5. It reads like a generic introductory statement that could belong to any discussion about animal rights, rather than one anchored in Singer's specific contribution. The other four sentences are tightly linked to Singer's identity, argument, and historical impact — sentence 1 lacks this specific connection and therefore stands apart as the odd sentence.

13. Correct Answer: C

This is a summary question testing your ability to identify the central argument of a dense, abstract passage. The passage makes two key points — first, that some codes become so widespread that they appear natural rather than constructed, and second, that this appearance of naturalness conceals the actual process of coding that underlies them.

Option C is correct because it captures both of these essential points accurately and completely. It acknowledges that language and visual signs are codes, notes that some become so widespread that they seem naturally given, and crucially includes the idea that this widespread naturalization hides or conceals the mechanism of coding behind signs. This is the passage's core argument — naturalization is not the absence of coding but rather coding so deeply embedded that it becomes invisible.

Option A is incorrect because it claims that all codes have a natural origin, which directly contradicts the passage. The passage explicitly states that codes are constructed — the effect of an articulation between sign and referent — and that they only appear natural because they have been profoundly naturalized. Natural origin and naturalization are two very different things.

Option B gets part of the argument right by distinguishing between natural and naturalized codes, but it misrepresents the role of ideology. The passage says the concealment of coding practices is an ideological effect — a consequence of naturalization — not a deliberate aim of ideology. Presenting ideology as actively aiming to hide the coding mechanism overstates and distorts what the passage actually says.

Option D is too narrow because it reduces the entire process of naturalization to simply learning codes at an early age. While early learning is mentioned as one factor, the passage's argument about naturalization is much broader — it is about depth, habituation, and near-universality across a language community or culture, not just childhood learning.

14. Correct Answer: D

This is a "weaken/invalidate the argument" question — a critical reasoning type that asks you to find the statement that most directly undermines the central claim of the passage. The main argument of the passage is that no current medium — streaming, physical media, or digital purchases — reliably guarantees permanent, unrestricted access to content that consumers have paid for.

Option D is correct because it directly and completely addresses the core of the passage's argument. If studios and streaming services committed to giving customers perpetual and platform-independent access to the original content they paid for, then the fundamental problem the passage describes — loss of access due to removals, geo-restrictions, DRM locks, and platform dependencies — would simply cease to exist. This is not a partial fix; it resolves the very issue at the heart of the passage, making the entire argument redundant. A direct commitment of this kind would invalidate the passage most comprehensively.

Option A only partially weakens the argument. While improved cloud storage addresses the problem of data decay and file migration mentioned in paragraph

three, it does nothing to resolve DRM restrictions, geo-blocking, or studios quietly removing content from platforms. The passage's concerns are broader than just data preservation.

Option B addresses the geo-blocking problem illustrated by the iTunes/Cars 2 example, but VPNs are a workaround, not a solution. They do not address DRM locks, content removals from streaming services, or the broader ownership concerns the passage raises. A partial workaround cannot invalidate the main argument.

Option C only strengthens the case for physical media as a preservation option, but the passage itself acknowledges the 100-year claim while questioning it as theoretical. More importantly, even if proven true, it does nothing to address streaming removals, digital rights restrictions, or data decay in other formats — leaving most of the passage's argument intact.

15. Correct Answer: D

This question tests your ability to understand the purpose of a specific example within its immediate context, rather than the broader themes of the passage. The key is to ask — why did the author include this particular example at this particular point in the passage?

Option D is correct because it most precisely captures why the author uses this example. The sentence immediately preceding the Stranger Things reference tells us that the removal of content "seemed like vindication to those who had long warned that streaming was more about controlling access to the cultural commons than expanding it." The Stranger Things example is presented as further evidence supporting these same fears — that streaming services cannot be trusted to preserve cultural artefacts in their original, authentic form. The example validates the concern that streaming platforms feel empowered to alter content at will, justifying the distrust of those who worry about streaming as a custodian of culture.

Option A goes too broad by framing the example as a general statement about digital art no longer being sacrosanct. While this idea is loosely related, the passage is specifically about streaming services and their trustworthiness as custodians — not about the nature of digital art in general. The scope of option A stretches beyond what the example is meant to illustrate.

Option B is also too broad. Controlling access to the cultural commons is indeed a theme in the passage, but the Stranger Things example is specifically about altering content, not restricting access to it. These are two distinct concerns, and conflating them makes option B an imprecise fit for this particular example.

Option C misreads the tone and intent of the example entirely. The author does not use the Stranger Things reference to discuss unsubstantiated rumours or their effect on trust. Even though the passage mentions the reports were denied, the example is still presented as part of a broader pattern of legitimate concerns — not as a case study in how rumours spread distrust.

16. Correct Answer: D

This question asks you to identify which statement about art best captures the overall argument of the passage. The key word here is "arguments" — the correct answer must reflect what the passage is actually arguing, not just touch on a related theme.

Option D is correct because it precisely captures the central paradox that the passage builds across all its paragraphs. One would naturally assume that digital technology — streaming, digital purchases, cloud storage — would make art more accessible than ever before. The passage argues the opposite. Content gets quietly removed from streaming platforms, digital purchases are locked by DRM restrictions, files decay or become unreadable as formats change, and studios are willing to destroy content for short-term financial gain. The phrase "counterintuitively likely to be made more difficult" is the key — it mirrors the passage's core irony that digital distribution, despite its promise, actually makes long-term access to art less reliable and less secure.

Option A is partially relevant but misses the mark. The passage does touch on art being altered or removed, but it never argues that we should "change our understanding" of art's immutability as something desirable or inevitable. The passage's tone is critical of these changes, not accepting of them as a new normal.

Option B focuses too narrowly on the retroactive editing of Stranger Things, which is a single illustrative example in the passage, not its central argument. The passage is not making a case about creative effort or the dangers of editing — it is about access, ownership, and preservation.

Option C introduces an idealistic philosophical claim about art belonging to the cultural commons that goes beyond what the passage argues. While the passage does use the phrase "cultural commons," it does so descriptively, not to make a normative argument about universal ownership. The passage is concerned with practical access and preservation, not with making a philosophical statement about who art belongs to.

17. Correct Answer: A

This question tests your ability to infer what a specific sentence implies by understanding the contrast it sets up. The sentence uses the phrase "back then, at least" — which is a clear signal that the author is drawing a contrast between how cinema was perceived in the past and how it is perceived today.

Option A is correct because it correctly identifies what the contrast implies about the present. If cinema was once defined by its ephemerality — the understanding that a film was essentially gone once it left the local theatre — then the logical implication for today is the opposite: audiences now expect films to remain available long after their theatrical run. This expectation of long-term availability is precisely what makes the studios' removal of content so alarming and worthy of criticism, which is the broader point the passage is making. Option A captures this implied contrast cleanly and accurately.

Option B is incorrect because it attributes the change to improvements in technology for creating and preserving films. The sentence does not make any reference to technological advancement — it is about a shift in audience expectations and cultural attitudes toward film availability, not about the technical means of preservation.

Option C goes beyond what the sentence implies by making a normative claim — that studios have no reason to remove films. While this may align with the passage's broader critical tone, it is not what this particular sentence is suggesting. The sentence is about changing perceptions of ephemerality, not about making a judgement on studio behaviour.

Option D is true as a historical observation — people in the past were indeed more accepting of films disappearing after their theatrical run — but it only captures the "back then" half of the contrast. The sentence is specifically structured to draw a comparison between past and present, and option D fails to address what that contrast implies about today's expectations, making it an incomplete and therefore weaker answer.

18. Correct Answer: C

This question tests your ability to draw an inference by comparing two systems — medieval craft guilds and mass production — and identifying what they share in common. The answer must be supported by what the passage actually says about both.

Option C is correct because the passage explicitly makes this connection. Mass production, represented by the "American system" and standardised parts, prioritised efficiency and consistency over creativity — the very antithesis of individual judgment and imagination. Medieval craft guilds, on the other hand, despite being associated with craftsmanship, "resisted new entrants" and were "highly hierarchical," knocking the innovative spirit out of young apprentices before they could practise independently. The passage concludes this point by saying "the link between crafts and creativity is not automatic." Both systems, therefore, failed to necessarily promote creativity — mass production by design, and craft guilds by their restrictive structure. This is the common ground the passage draws between them.

Option A is incorrect because while craft guilds did restrict entry and discourage innovation, mass production systems do not typically restrict entry through strict rules. Mass production actually thrives on expanding the workforce and standardising processes — the barrier it creates is to individual creativity, not to entry itself.

Option B is partially relevant since both systems were hierarchical in their own ways, but the passage does not frame the comparison between craft guilds and mass production in terms of egalitarian processes. This option picks up on a real detail but misidentifies it as the point of comparison.

Option D is incorrect because the passage does not suggest that mass production focused excessively on product quality — in fact, it prioritised standardisation and efficiency, which is quite different from a devotion to quality. Quality is associated with craftsmanship, not mass production.

19. Correct Answer: A

This question uses a double negative — "NOT inconsistent" — which means you are looking for the statement that is consistent with or supported by the passage. Three options will contradict or distort the passage's views, and one will align with them.

Option A is correct because it directly echoes one of the passage's closing arguments. The final paragraph warns that "craft workers can thrive in the modern era, but only if they don't get too organised." The historical example of medieval craft guilds is used to illustrate how over-organisation — through monopolies, hierarchies, and restricted entry — ended up suppressing the very creativity that craftsmanship is supposed to embody. Option A restates this idea in slightly different words, making it fully consistent with the passage's views.

Option B is inconsistent because it reverses the cause-and-effect relationship described in the passage. The passage clearly states that the Arts and Crafts movement was a reaction against the "American system" of mass production — it emerged in opposition to standardisation and efficiency, not as something inspired by it. Saying it was "inspired by" the American system directly contradicts the passage.

Option C is inconsistent because it makes an absolute claim — that supporting crafts is the only way to retain creativity intrinsic to their production. The passage does not make this claim. In fact, the passage explicitly warns that crafts do not automatically guarantee creativity, citing the example of medieval guilds. The link between crafts and creativity is described as conditional, not intrinsic or guaranteed.

Option D is inconsistent because it draws a false equivalence between the agile movement and medieval craft guilds. The passage presents the agile manifesto as a modern example of craftsmanship's positive values — prioritising individuals, interactions, and creativity. Medieval craft guilds, by contrast, are presented as hierarchical, monopolistic, and innovation-suppressing. Linking the two as similar contradicts the passage's treatment of both.

20. Correct Answer: B

This question tests your ability to locate the specific reason the author gives for doubting crafts' potential to create substantial employment. The relevant section is in the final two paragraphs, where the author raises several concerns about the scalability of crafts as an employment solution.

Option B is correct because the passage directly states that "in a world where products and services often have to pass through regulatory hoops, large companies will usually have the advantage." This means that small crafts outfits, despite their appeal, are structurally disadvantaged when it comes to navigating regulatory requirements — something large companies handle more easily due to their resources and scale. This regulatory barrier is presented as a concrete reason why crafts may struggle to generate substantial employment in the current environment.

Option C is incorrect because the passage does not suggest that workers made redundant by automation would be unwilling to take up crafts-related work. The passage asks whether it would "be easy to retrain workers" — the concern is about the feasibility of retraining, not about workers' willingness or preference. Reading unwillingness into the passage goes beyond what is actually stated.

Option A is incorrect because while the passage does acknowledge that demand for crafted products may rise, it does not specifically argue that the low scale of crafts production is the primary barrier to employment creation. The passage's concern is

more structural — about regulation and competition from large companies — rather than about production scale alone.

Option D is incorrect because the reference to craft guilds resisting new entrants is a historical observation about medieval guilds, not a claim about how present-day crafts industries operate. The author uses this example to discuss creativity, not to explain current employment limitations in the crafts sector.

21. Correct Answer: A

This is an "EXCEPT" question, which means three of the four options will be reasons that the passage explicitly connects to the most recent revival of interest in crafts, and one will not. The question specifically asks about the most recent — the third — crafts revival, which the passage says is "emerging as people become aware of the environmental impact of conventional industry."

Option A is the answer because a niche market for discerning buyers of quality products is described in the passage as one of the two potential markets for crafts practitioners, but it is not specifically linked to the most recent revival. The passage presents this premium-quality market as a general, ongoing feature of the crafts economy rather than a driver of the current environmental-awareness-driven revival. It existed alongside earlier crafts movements as well and is not unique to the third wave.

Option D is directly and explicitly linked to the most recent revival. The passage states that "a third crafts movement is emerging as people become aware of the environmental impact of conventional industry." Environmental concern is the stated trigger for this revival.

Option C is also supported by the passage, which describes consumers who wish to "support local workers" or "reduce their environmental impact by taking goods to craftspeople to be mended or recycled." Both motivations — buying locally and environmental consciousness — are presented as current drivers of interest in crafts.

Option B is supported by the passage's broader argument that crafts emphasise "the human touch and individual judgment" as a counterpoint to mass production. The contrast between individual creation and mass-produced objects runs throughout the passage as a motivating force behind crafts revivals generally and the current one specifically.

22. Correct Answer: A

This is a sentence insertion question that tests your understanding of thematic flow and logical coherence within a paragraph. The inserted sentence makes two claims — first, that Renaissance music covered a wide range of emotions, and second, that it portrayed all these emotions in a balanced and moderate fashion. The key is to find where this sentence fits most naturally within the surrounding context.

Option 3 is correct because the sentences surrounding blank 3 are specifically about the structural and expressive characteristics of Renaissance music. The sentence immediately before blank 3 tells us that "Renaissance music was mostly polyphonic in texture," and the sentence immediately after states that "extreme contrasts in dynamics, rhythm, and tone colour do not occur." The inserted

sentence bridges these two ideas perfectly — it introduces the emotional dimension of Renaissance music and immediately establishes that even emotions were expressed with balance and moderation, which naturally leads into the point about the absence of extreme contrasts. The logical chain flows smoothly: polyphonic texture → balanced emotional expression → no extreme contrasts in dynamics or rhythm.

Option 1 is incorrect because that part of the paragraph is discussing the historical context of the English madrigal boom and the golden age of music. Inserting a sentence about emotional balance in Renaissance music here would be thematically jarring and disconnected from the historical narrative being developed.

Option 2 is incorrect because the surrounding text at that point is focused on the cultural migration of the Renaissance from Italy to England and the stylistic differences between Italian and English madrigals. The inserted sentence's focus on emotional moderation does not connect to this cultural and geographical theme.

Option 4 is incorrect because the paragraph at that point is already discussing Renaissance rhythms and their smooth, soft flow. Inserting the sentence here would interrupt a specific, focused discussion about rhythm and create a backwards logical jump — moving from a specific point about rhythm back to a broader claim about emotional expression.

23. Correct Answer: B

This is a summary question that requires you to identify the central argument of the passage without being too narrow, too broad, or factually distorted. The passage traces a shift in how cartographers approach their work — from a past where they made maps based on their own expertise without worrying much about the reader, to a present where technological developments have made usability a central concern.

Option B is correct because it captures both the cause and the effect of this shift cleanly and completely. The cause is new technological developments, and the effect is that cartographers now need to consider the usability of their maps — whether they are efficient, effective, and appreciated by users. This is precisely the arc of the passage, and option B reflects it without overstating or understating anything.

Option A is incorrect because it suggests that cartographers are experimenting with new innovations in their maps, which is not what the passage argues. The passage does not focus on cartographers applying technological innovations to map design — it focuses on how technology has changed the demands of map readers, which in turn has changed what cartographers need to prioritise.

Option C is incorrect because it attributes map readers becoming more demanding solely to maps being used for a variety of reasons. The passage is more specific — it is technological developments and the tools readers use that have made them more demanding. Option C is too vague and misidentifies the cause of the shift.

Option D is incorrect because it places excessive emphasis on experiments and evaluation processes, suggesting that conducting experiments is the main focus of modern cartography. While the passage does mention that cartographers are now

interested in whether their products are efficient, effective, and appreciated, this is stated as an outcome of the broader shift — not as the central point of the passage.

24. Correct Answer: 2

This is a parajumble odd-sentence-out question. The task is to identify which sentence does not logically belong with the other four and isolate it as the odd one out.

The four sentences that form a coherent paragraph are 5, 3, 4, and 1. Sentence 5 opens the paragraph by establishing the central puzzle — a decline in urban public transport usage despite growing urban populations and rising employment. Sentence 3 follows naturally by listing the commonly cited reasons for this decline — worsening services, terrorist attacks, and rising fares. Sentence 4 then pushes the argument further, suggesting that these surface-level explanations are insufficient and that the real cause is a structural shift — people simply need to travel less due to smartphones, videoconferencing, and online shopping. Sentence 1 completes the picture by pointing out that urbanites now have better alternative modes of transport — Uber, dockless bicycles, and scooters — reinforcing the idea that public transport is being squeezed from multiple directions. Together, these four sentences build a tight, logical argument about why urban public transport is declining.

Sentence 2 is the odd one out because it moves in the opposite direction entirely. It makes the point that when more people use public transport, services improve — a positive feedback loop argument. This idea is not only unrelated to the theme of declining ridership but actually contradicts the direction of the paragraph's argument. The paragraph is about why fewer people are using public transport, while sentence 2 discusses what happens when more people use it. It introduces a completely different logical framework and disrupts the coherence of the paragraph.

DILR

1. Correct Answer – D
Explanation:

Daily Share Price Variability (SPV) for A $= \frac{2400-1200}{2000} = \frac{1200}{2000} = \frac{3}{5}$

Daily Share Price Variability (SPV) for C $= \frac{1400-800}{1000} = \frac{600}{1000} = \frac{3}{5}$

Daily Share Price Variability (SPV) for F $= \frac{2000-1200}{1700} = \frac{800}{1700} = \frac{8}{17}$

Daily Share Price Variability (SPV) for D $= \frac{1200-300}{750} = \frac{900}{750} = \frac{6}{5}$

We can see that value of Daily Share Price Variability (SPV) for D is max as it is the only value which is greater than 1. All other values are less than 1. Hence option D.

2. Correct Answer – 4
Explanation:

Daily Share Price Variability (SPV) for A $= \frac{2400-1200}{2000} = \frac{1200}{2000} = \frac{3}{5} = 0.6$

Daily Share Price Variability (SPV) for C $= \frac{1400-800}{1000} = \frac{600}{1000} = \frac{3}{5} = 0.6$

Daily Share Price Variability (SPV) for F $= \frac{2000-1200}{1700} = \frac{800}{1700} = \frac{8}{17} = 0.47$

Daily Share Price Variability (SPV) for D $= \frac{1200-300}{750} = \frac{900}{750} = \frac{6}{5} = 1.2$

Daily Share Price Variability (SPV) for B $= \frac{2000-1400}{1850} = \frac{600}{1850} = \frac{12}{37} = 0.32$

Daily Share Price Variability (SPV) for E $= \frac{1400-1100}{1200} = \frac{300}{1200} = \frac{1}{4} = 0.25$

Daily Share Price Variability (SPV) for G $= \frac{1900-1000}{1450} = \frac{900}{1450} = \frac{18}{29} = 0.62$

From the above, we can see that value of SPV of 4 shares i.e., A, C, D and G is greater than 0.5. Hence 4 is the answer.

3. Correct Answer – C
Explanation:

Daily Loss for A $= \frac{2200-1800}{2200} = \frac{400}{2200} = \frac{4}{22} = \frac{2}{11} = 0.18$

Daily Loss for B $= \frac{2000-1700}{2000} = \frac{300}{2000} = \frac{3}{20} = 0.15$

Daily Loss for F $= \frac{1800-1600}{1800} = \frac{200}{1800} = \frac{2}{18} = \frac{1}{9} = 0.11$

Daily Loss for G $= \frac{1200-1700}{1200} = -\frac{500}{1200} = -\frac{5}{12} = -0.42$

From the above table, we can see that value of Daily Loss for A is maximum. Hence option C.

4. Correct Answer – B
Explanation:

As seen from the graph, the bullish shares are C, D and G.
Let us assume he purchases one share each of C, D and G.
CP of one share of C = 800 and SP of one share of C = 1400
CP of one share of D = 500 and SP of one share of D = 1200
CP of one share of G = 1200 and SP of one share of G = 1900
So Total Cost of purchasing one share of each of C, D and G = 800 + 500 + 1200 = 2500
Total Selling Price of one share of each of C, D and G = 1400 + 1200 + 1900 = 4500.
Hence Percentage Gain $= \frac{4500-2500}{2500} \times 100 = \frac{2000}{2500} \times 100 = 80\%$.

5. Correct Answer – D
Explanation:

If both of them run staid 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. So the percentage would be 20(1 + 1) % = 40%.
But as both of them run staid campaigns attacking the other, then 10% of 40% will not vote at all. Hence answer would be 90% of 40% which is equal to 36%.

6. Correct Answer – A
Explanation:

Minimum percentage of students who will vote will be obtained when they run staid campaign as it of level 1.
Also, if they run staid campaigns attacking the other, then percentage voting would be further reduced. So minimum percentage will be obtained as 90% of 20(1 + 1)% = 90% of 40% = 36%.

7. Correct Answer – C
Explanation:

If both of them run vigorous 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. So, the percentage would be 20(2+2) % = 80%. Hence each of them would get 40% votes.
It is given that Amiya runs a campaign focusing on issues. To maximise percentage of votes she gets, will be obtained when Ramya runs a campaign attacking their opponent.
So, the reduction in the percentage of votes obtained by Ramya would be 20% of 40% = 8% which would be added to percentage of votes of Amiya. So, Amiya would get 40% + 8% = 48% votes. Also 5% who would have otherwise voted for Ramya,

will not vote at all. Hence total reduction in the percentage of votes for Ramya would be 8% + 5% of 40% = 10%. So answer of this question is 48%.

8. Correct Answer – A
Explanation:

Minimum percentage of students who will vote will be obtained when they run staid campaign as it of level 1.
If both of them run staid 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. So, the percentage would be 20(1 + 1) % = 40%. Hence each of them would get 20% votes.
It is given that Ramya runs a campaign attacking their opponent. So, the reduction in the percentage of votes obtained by Ramya would be 20% of 20% = 4% which would be added to percentage of votes of Amiya. Also 5% who would have otherwise voted for Ramya, will not vote at all. Hence total reduction in the percentage of votes for Ramya would be 4% + 5% of 20% = 4% + 1% = 5%. So minimum percentage of votes that she is guaranteed to get will be 20% – 5% = 15%.

9. Correct Answer – A
Explanation:

Maximum possible voting margin with which one of the candidates can win will be obtained when one of them runs vigorous campaign and the other runs staid campaign.
If Amiya runs vigorous campaign focusing on issues and Ramya runs staid 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. So, the percentage would be 20(2+1) % = 60%. Hence Amiya would get 40% votes and Ramya would get 40% votes.
Now if Ramya runs a campaign attacking their opponent. So, the reduction in the percentage of votes obtained by Ramya would be 20% of 20% = 4% which would be added to percentage of votes of Amiya. So, Amiya would get 40% + 4% = 44% votes.
Also 5% who would have otherwise voted for Ramya, will not vote at all.
Hence total reduction in the percentage of votes for Ramya would be 4% + 5% of 20% = 4% + 1% = 5%.
So minimum percentage of votes that she is guaranteed to get will be 20% – 5% = 15%.
Hence maximum voting margin will be 44% – 15% = 29%.

10. Correct Answer – 8
Explanation:

It is given that the 6 teams are divided into two groups containing 3 teams each. As each team in the same group plays every other team once and in the other group twice, so there would be 3 matches among teams of same group and 6 matches among teams of different group. Hence, we can find the total matches in the tournament as 3 + 3 + 6 + 6 + 6 = 24.
Also, every team plays exactly one game in one round means each round will have 3 matches involving each team. Hence there will be 8 rounds in the tournament.

Now we will further analyse the given information:

As we can see that Team 3 played against Team 6 twice, Team 2 played against Team 5 twice and Team 1 played against Team 4 twice, so Teams 3 & 6, 2 & 5 and 1 & 4 are of different groups.
Now considering points 3 and 4, we get the information that Teams 4 and 6 are of different groups and Teams 1 and 5 are of same group.
Hence, we can say that Teams 1, 5 and 6 make a group (say Group I) and correspondingly Teams 2, 3 and 4 (say Group II) make the other group.

So, we can list down the matches which will be played among teams of Group I and Group II

Group I	**Group II**
Team 1 Vs Team 6	Team 2 Vs Team 3
Team 1 Vs Team 5	Team 2 Vs Team 4
Team 5 Vs Team 6	Team 3 Vs Team 4

Also, we can make a list of matches which were played between teams of different groups:

Team 3 Vs Team 6
Team 2 Vs Team 5
Team 1 Vs Team 4
Team 3 Vs Team 5
Team 1 Vs Team 3
Team 2 Vs Team 6
Team 1 Vs Team 2
Team 4 Vs Team 6
Team 4 Vs Team 5

From point 6, it is given that Team 3 played Team 8 and Team 2 played Team 5. Clubbing this information with the information in point 1 that each team played against a team from the other group in Round 8, we can surely conclude that the 3rd match of Round 8 must have been played between Team 1 and 4.

Also, as per point 2, match ups of Round 5 and Round 8 were identical. Hence, we get the details of matches played in Round 5.
Now using information given in points 3, 4, 5 and 6, we will find the details of matches played in various rounds and put the information in a table where alphabet T stands for Team:

Round 1	**Round 2**	**Round 3**	**Round 4**	**Round 5**	**Round 6**	**Round 7**	**Round 8**
T4 Vs T6	T4 Vs T6	T3 Vs T4		T3 Vs T6	T1 Vs T6		T3 Vs T6
	T1 Vs T5			T2 Vs T5			T2 Vs T5
				T1 Vs T4			T1 Vs T4

As it is given that every team plays exactly one game in each round, so we can see that T6 would be definitely there in Round 4 and Round 7. Considering the list of matches given for different groups, only T2 is left to play against T6. Hence T2 and T6 would play against each other in Round 4 and 7.

Also match between T2 and T4 is to be played only once. This will be necessarily played in Round 6 as T4 is already playing in Rounds 1, 2 and 3.

Also match between T1 and T2 is to be played twice. This will be necessarily played in Round 1 and Round 3. It means match between T5 and T6 which is to be played only once will be in Round 3.

Also match between T4 and T5 is to be played twice. This will be necessarily played in Round 4 and Round 7. It means match between T1 and T3 which is to be played twice would also be played in Round 4 and Round 7.

So, after filling all the above information, we get the final table as follows:

Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
T4 Vs T6	T4 Vs T6	T3 Vs T4	T1 Vs T3	T3 Vs T6	T1 Vs T6	T1 Vs T3	T3 Vs T6
T3 Vs T5	T1 Vs T5	T5 Vs T6	T2 Vs T6	T2 Vs T5	T2 Vs T4	T2 Vs T6	T2 Vs T5
T1 VS T2	T2 Vs T3	T1 Vs T2	T4 Vs T5	T1 Vs T4	T3 Vs T5	T4 Vs T5	T1 Vs T4

As shown, there were 8 Rounds in the tournament.

QUANTIFIERS CAT ACADEMY

11. Correct Answer – 4
Explanation:

It is given that the 6 teams are divided into two groups containing 3 teams each. As each team in the same group plays every other team once and in the other group twice, so there would be 3 matches among teams of same group and 6 matches among teams of different group. Hence, we can find the total matches in the tournament as 3 + 3 + 6 + 6 + 6 = 24.
Also, every team plays exactly one game in one round means each round will have 3 matches involving each team. Hence there will be 8 rounds in the tournament.

Now we will further analyse the given information:
As we can see that Team 3 played against Team 6 twice, Team 2 played against Team 5 twice and Team 1 played against Team 4 twice, so Teams 3 & 6, 2 & 5 and 1 & 4 are of different groups.
Now considering points 3 and 4, we get the information that Teams 4 and 6 are of different groups and Teams 1 and 5 are of same group.
Hence, we can say that Teams 1, 5 and 6 make a group (say Group I) and correspondingly Teams 2, 3 and 4 (say Group II) make the other group.

So we can list down the matches which will be played among teams of Group I and Group II

Group I	**Group II**
Team 1 Vs Team 6	Team 2 Vs Team 3
Team 1 Vs Team 5	Team 2 Vs Team 4
Team 5 Vs Team 6	Team 3 Vs Team 4

Also, we can make a list of matches which were played between teams of different groups:

Team 3 Vs Team 6
Team 2 Vs Team 5
Team 1 Vs Team 4
Team 3 Vs Team 5
Team 1 Vs Team 3
Team 2 Vs Team 6
Team 1 Vs Team 2
Team 4 Vs Team 6
Team 4 Vs Team 5

From point 6, it is given that Team 3 played Team 8 and Team 2 played Team 5. Clubbing this information with the information in point 1 that each team played against a team from the other group in Round 8, we can surely conclude that the 3rd match of Round 8 must have been played between Team 1 and 4.

Also, as per point 2, match ups of Round 5 and Round 8 were identical. Hence, we get the details of matches played in Round 5.
Now using information given in points 3, 4, 5 and 6, we will find the details of matches played in various rounds and put the information in a table where alphabet T stands for Team:

Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
T4 Vs T6	T4 Vs T6	T3 Vs T4		T3 Vs T6	T1 Vs T6		T3 Vs T6
	T1 Vs T5			T2 Vs T5			T2 Vs T5
				T1 Vs T4			T1 Vs T4

As it is given that every team plays exactly one game in each round, so we can see that T6 would be definitely there in Round 4 and Round 7. Considering the list of matches given for different groups, only T2 is left to play against T6. Hence T2 and T6 would play against each other in Round 4 and 7.

Also match between T2 and T4 is to be played only once. This will be necessarily played in Round 6 as T4 is already playing in Rounds 1, 2 and 3.

Also match between T1 and T2 is to be played twice. This will be necessarily played in Round 1 and Round 3. It means match between T5 and T6 which is to be played only once will be in Round 3.

Also match between T4 and T5 is to be played twice. This will be necessarily played in Round 4 and Round 7. It means match between T1 and T3 which is to be played twice would also be played in Round 4 and Round 7.

So, after filling all the above information, we get the final table as follows:

Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
T4 Vs T6	T4 Vs T6	T3 Vs T4	T1 Vs T3	T3 Vs T6	T1 Vs T6	T1 Vs T3	T3 Vs T6
T3 Vs T5	T1 Vs T5	T5 Vs T6	T2 Vs T6	T2 Vs T5	T2 Vs T4	T2 Vs T6	T2 Vs T5
T1 VS T2	T2 Vs T3	T1 Vs T2	T4 Vs T5	T1 Vs T4	T3 Vs T5	T4 Vs T5	T1 Vs T4

As shown, Team 4 played Team 1 in Round 5.

12. Correct Answer – D
Explanation:

It is given that the 6 teams are divided into two groups containing 3 teams each. As each team in the same group plays every other team once and in the other group twice, so there would be 3 matches among teams of same group and 6 matches among teams of different group. Hence, we can find the total matches in the tournament as 3 + 3 + 6 + 6 + 6 = 24.
Also, every team plays exactly one game in one round means each round will have 3 matches involving each team. Hence there will be 8 rounds in the tournament.

Now we will further analyse the given information:
As we can see that Team 3 played against Team 6 twice, Team 2 played against Team 5 twice and Team 1 played against Team 4 twice, so Teams 3 & 6, 2 & 5 and 1 & 4 are of different groups.
Now considering points 3 and 4, we get the information that Teams 4 and 6 are of different groups and Teams 1 and 5 are of same group.
Hence, we can say that Teams 1, 5 and 6 make a group (say Group I) and correspondingly Teams 2, 3 and 4 (say Group II) make the other group.

So, we can list down the matches which will be played among teams of Group I and Group II

Group I	Group II
Team 1 Vs Team 6	Team 2 Vs Team 3
Team 1 Vs Team 5	Team 2 Vs Team 4
Team 5 Vs Team 6	Team 3 Vs Team 4

Also, we can make a list of matches which were played between teams of different groups:

Team 3 Vs Team 6
Team 2 Vs Team 5
Team 1 Vs Team 4
Team 3 Vs Team 5
Team 1 Vs Team 3
Team 2 Vs Team 6
Team 1 Vs Team 2
Team 4 Vs Team 6
Team 4 Vs Team 5

From point 6, it is given that Team 3 played Team 8 and Team 2 played Team 5. Clubbing this information with the information in point 1 that each team played against a team from the other group in Round 8, we can surely conclude that the 3rd match of Round 8 must have been played between Team 1 and 4.

Also, as per point 2, match ups of Round 5 and Round 8 were identical. Hence, we get the details of matches played in Round 5.
Now using information given in points 3, 4, 5 and 6, we will find the details of matches played in various rounds and put the information in a table where alphabet T stands for Team:

Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
T4 Vs T6	T4 Vs T6	T3 Vs T4		T3 Vs T6	T1 Vs T6		T3 Vs T6
	T1 Vs T5			T2 Vs T5			T2 Vs T5
				T1 Vs T4			T1 Vs T4

As it is given that every team plays exactly one game in each round, so we can see that T6 would be definitely there in Round 4 and Round 7. Considering the list of matches given for different groups, only T2 is left to play against T6. Hence T2 and T6 would play against each other in Round 4 and 7.

Also match between T2 and T4 is to be played only once. This will be necessarily played in Round 6 as T4 is already playing in Rounds 1, 2 and 3.

Also match between T1 and T2 is to be played twice. This will be necessarily played in Round 1 and Round 3. It means match between T5 and T6 which is to be played only once will be in Round 3.

Also match between T4 and T5 is to be played twice. This will be necessarily played in Round 4 and Round 7. It means match between T1 and T3 which is to be played twice would also be played in Round 4 and Round 7.

So after filling all the above information, we get the final table as follows:

Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
T4 Vs T6	T4 Vs T6	T3 Vs T4	T1 Vs T3	T3 Vs T6	T1 Vs T6	T1 Vs T3	T3 Vs T6
T3 Vs T5	T1 Vs T5	T5 Vs T6	T2 Vs T6	T2 Vs T5	T2 Vs T4	T2 Vs T6	T2 Vs T5
T1 VS T2	T2 Vs T3	T1 Vs T2	T4 Vs T5	T1 Vs T4	T3 Vs T5	T4 Vs T5	T1 Vs T4

We can see that Team 5 was not part of the same group as Teams 2,3 and 4. Hence option D.

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13. Correct Answer – 3
Explanation:

It is given that the 6 teams are divided into two groups containing 3 teams each. As each team in the same group plays every other team once and in the other group twice, so there would be 3 matches among teams of same group and 6 matches among teams of different group. Hence, we can find the total matches in the tournament as 3 + 3 + 6 + 6 + 6 = 24.
Also, every team plays exactly one game in one round means each round will have 3 matches involving each team. Hence there will be 8 rounds in the tournament.

Now we will further analyse the given information:
As we can see that Team 3 played against Team 6 twice, Team 2 played against Team 5 twice and Team 1 played against Team 4 twice, so Teams 3 & 6, 2 & 5 and 1 & 4 are of different groups.
Now considering points 3 and 4, we get the information that Teams 4 and 6 are of different groups and Teams 1 and 5 are of same group.
Hence, we can say that Teams 1, 5 and 6 make a group (say Group I) and correspondingly Teams 2, 3 and 4 (say Group II) make the other group.

So, we can list down the matches which will be played among teams of Group I and Group II

Group I	**Group II**
Team 1 Vs Team 6	Team 2 Vs Team 3
Team 1 Vs Team 5	Team 2 Vs Team 4
Team 5 Vs Team 6	Team 3 Vs Team 4

Also, we can make a list of matches which were played between teams of different groups:

Team 3 Vs Team 6
Team 2 Vs Team 5
Team 1 Vs Team 4
Team 3 Vs Team 5
Team 1 Vs Team 3
Team 2 Vs Team 6
Team 1 Vs Team 2
Team 4 Vs Team 6
Team 4 Vs Team 5

From point 6, it is given that Team 3 played Team 8 and Team 2 played Team 5. Clubbing this information with the information in point 1 that each team played against a team from the other group in Round 8, we can surely conclude that the 3rd match of Round 8 must have been played between Team 1 and 4.

Also, as per point 2, match ups of Round 5 and Round 8 were identical. Hence, we get the details of matches played in Round 5.
Now using information given in points 3, 4, 5 and 6, we will find the details of matches played in various rounds and put the information in a table where alphabet T stands for Team:

Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
T4 Vs T6	T4 Vs T6	T3 Vs T4		T3 Vs T6	T1 Vs T6		T3 Vs T6
	T1 Vs T5			T2 Vs T5			T2 Vs T5
				T1 Vs T4			T1 Vs T4

As it is given that every team plays exactly one game in each round, so we can see that T6 would be definitely there in Round 4 and Round 7. Considering the list of matches given for different groups, only T2 is left to play against T6. Hence T2 and T6 would play against each other in Round 4 and 7.

Also match between T2 and T4 is to be played only once. This will be necessarily played in Round 6 as T4 is already playing in Rounds 1, 2 and 3.

Also match between T1 and T2 is to be played twice. This will be necessarily played in Round 1 and Round 3. It means match between T5 and T6 which is to be played only once will be in Round 3.

Also match between T4 and T5 is to be played twice. This will be necessarily played in Round 4 and Round 7. It means match between T1 and T3 which is to be played twice would also be played in Round 4 and Round 7.

So, after filling all the above information, we get the final table as follows:

Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
T4 Vs T6	T4 Vs T6	T3 Vs T4	T1 Vs T3	T3 Vs T6	T1 Vs T6	T1 Vs T3	T3 Vs T6
T3 Vs T5	T1 Vs T5	T5 Vs T6	T2 Vs T6	T2 Vs T5	T2 Vs T4	T2 Vs T6	T2 Vs T5
T1 VS T2	T2 Vs T3	T1 Vs T2	T4 Vs T5	T1 Vs T4	T3 Vs T5	T4 Vs T5	T1 Vs T4

As shown, Team 3 played Team 1 in Round 7.

14. Correct Answer – 5
Explanation:

It is given that the 6 teams are divided into two groups containing 3 teams each. As each team in the same group plays every other team once and in the other group twice, so there would be 3 matches among teams of same group and 6 matches among teams of different group. Hence, we can find the total matches in the tournament as 3 + 3 + 6 + 6 + 6 = 24.
Also, every team plays exactly one game in one round means each round will have 3 matches involving each team. Hence there will be 8 rounds in the tournament.

Now we will further analyse the given information:
As we can see that Team 3 played against Team 6 twice, Team 2 played against Team 5 twice and Team 1 played against Team 4 twice, so Teams 3 & 6, 2 & 5 and 1 & 4 are of different groups.
Now considering points 3 and 4, we get the information that Teams 4 and 6 are of different groups and Teams 1 and 5 are of same group.
Hence, we can say that Teams 1, 5 and 6 make a group (say Group I) and correspondingly Teams 2, 3 and 4 (say Group II) make the other group.

So, we can list down the matches which will be played among teams of Group I and Group II

Group I	Group II
Team 1 Vs Team 6	Team 2 Vs Team 3
Team 1 Vs Team 5	Team 2 Vs Team 4
Team 5 Vs Team 6	Team 3 Vs Team 4

Also, we can make a list of matches which were played between teams of different groups:

Team 3 Vs Team 6
Team 2 Vs Team 5
Team 1 Vs Team 4
Team 3 Vs Team 5
Team 1 Vs Team 3
Team 2 Vs Team 6
Team 1 Vs Team 2
Team 4 Vs Team 6
Team 4 Vs Team 5

From point 6, it is given that Team 3 played Team 8 and Team 2 played Team 5. Clubbing this information with the information in point 1 that each team played against a team from the other group in Round 8, we can surely conclude that the 3rd match of Round 8 must have been played between Team 1 and 4.

Also, as per point 2, match ups of Round 5 and Round 8 were identical. Hence, we get the details of matches played in Round 5.
Now using information given in points 3, 4, 5 and 6, we will find the details of matches played in various rounds and put the information in a table where alphabet T stands for Team:

Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
T4 Vs T6	T4 Vs T6	T3 Vs T4		T3 Vs T6	T1 Vs T6		T3 Vs T6
	T1 Vs T5			T2 Vs T5			T2 Vs T5
				T1 Vs T4			T1 Vs T4

As it is given that every team plays exactly one game in each round, so we can see that T6 would be definitely there in Round 4 and Round 7. Considering the list of matches given for different groups, only T2 is left to play against T6. Hence T2 and T6 would play against each other in Round 4 and 7.

Also match between T2 and T4 is to be played only once. This will be necessarily played in Round 6 as T4 is already playing in Rounds 1, 2 and 3.

Also match between T1 and T2 is to be played twice. This will be necessarily played in Round 1 and Round 3. It means match between T5 and T6 which is to be played only once will be in Round 3.

Also match between T4 and T5 is to be played twice. This will be necessarily played in Round 4 and Round 7. It means match between T1 and T3 which is to be played twice would also be played in Round 4 and Round 7.

So, after filling all the above information, we get the final table as follows:

Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
T4 Vs T6	T4 Vs T6	T3 Vs T4	T1 Vs T3	T3 Vs T6	T1 Vs T6	T1 Vs T3	T3 Vs T6
T3 Vs T5	T1 Vs T5	T5 Vs T6	T2 Vs T6	T2 Vs T5	T2 Vs T4	T2 Vs T6	T2 Vs T5
T1 VS T2	T2 Vs T3	T1 Vs T2	T4 Vs T5	T1 Vs T4	T3 Vs T5	T4 Vs T5	T1 Vs T4

As shown, Team 5 played Team 6 in Round 3.

15. Correct Answer – 45
Explanation:

It is given that all the six web surfers each had 30 stars. Hence total number of stars = 30 × 6 = 180.
As per the given information and analysing the graph, we can make the initial table:

	M	N	O	P	X	Y	Total
A	10	25	0	5	0	5	45
B	0	0	0	25	0	20	45
C				0			45
D				0			45
Total	30	30	30	30	30	30	180

As it is given that the numbers of stars received by the bloggers from the surfers were all multiples of 5 (including 0), so possible values of stars given to the all the bloggers were any of the values 0 or 5 or 10 or 15 or 25 or 30.

From the 4th point, we can say that the two surfers who gave all their stars to a single blogger must be O and X. Also, that blogger is C and D in any order.
As per point 5, D received more stars than C from Y. This tells us that D got 5 stars from Y and C got 0 stars from Y.

As per point 3, C and D could receive 5 and 15 stars from M in any order.

Now let us assume that C received 5 stars from M. So D received 15 stars from M. Hence either O or X gave 30 stars to C. Then N has to give 10 stars to C which is not possible as total stars of N will exceed 30 and total stars of D would exceed 45.

This case is shown below in the table:

	M	N	O	P	X	Y	Total
A	10	25	0	5	0	5	45
B	0	0	0	25	0	20	45
C	5	10	30/0	0	0/30	0	45
D	15		0/30	0	30/0	5	45
Total	30	30	30	30	30	30	180

So, we will the other case which would be valid in which C received 15 stars from M. So, D received 5 stars from M. Hence either O or X gave 30 stars to C and D in any order.
So, we get the final table as follows

	M	N	O	P	X	Y	Total
A	10	25	0	5	0	5	45
B	0	0	0	25	0	20	45
C	15	0	30/0	0	0/30	0	45
D	5	5	0/30	0	30/0	5	45
Total	30	30	30	30	30	30	180

As it is given in the information that total number of stars received by the bloggers is the same, so each would receive 180/4 = 45 stars. Hence answer is 45.

16. Correct Answer – B
Explanation:

It is given that all the six web surfers each had 30 stars. Hence total number of stars = 30 × 6 = 180.
As per the given information and analysing the graph, we can make the initial table:

	M	N	O	P	X	Y	Total
A	10	25	0	5	0	5	**45**
B	0	0	0	25	0	20	**45**
C				0			**45**
D				0			**45**
Total	**30**	**30**	**30**	**30**	**30**	**30**	**180**

As it is given that the numbers of stars received by the bloggers from the surfers were all multiples of 5 (including 0), so possible values of stars given to the all the bloggers were any of the values 0 or 5 or 10 or 15 or 25 or 30.

From the 4th point, we can say that the two surfers who gave all their stars to a single blogger must be O and X. Also, that blogger is C and D in any order.
As per point 5, D received more stars than C from Y. This tells us that D got 5 stars from Y and C got 0 stars from Y.

As per point 3, C and D could receive 5 and 15 stars from M in any order.

Now let us assume that C received 5 stars from M. So, D received 15 stars from M. Hence either O or X gave 30 stars to C. Then N has to give 10 stars to C which is not possible as total stars of N will exceed 30 and total stars of D would exceed 45.

This case is shown below in the table:

	M	N	O	P	X	Y	Total
A	10	25	0	5	0	5	**45**
B	0	0	0	25	0	20	**45**
C	5	10	30/0	0	0/30	0	**45**
D	15		0/30	0	30/0	5	**45**
Total	**30**	**30**	**30**	**30**	**30**	**30**	**180**

So, we will the other case which would be valid in which C received 15 stars from M. So, D received 5 stars from M. Hence either O or X gave 30 stars to C and D in any order.
So, we get the final table as follows

	M	N	O	P	X	Y	Total
A	10	25	0	5	0	5	**45**
B	0	0	0	25	0	20	**45**
C	15	0	30/0	0	0/30	0	**45**
D	5	5	0/30	0	30/0	5	**45**
Total	**30**	**30**	**30**	**30**	**30**	**30**	**180**

As shown in the table, D would receive 5 stars from Y.

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17. Correct Answer – 2
Explanation:

It is given that all the six web surfers each had 30 stars. Hence total number of stars = 30 × 6 = 180.
As per the given information and analysing the graph, we can make the initial table:

	M	N	O	P	X	Y	Total
A	10	25	0	5	0	5	**45**
B	0	0	0	25	0	20	**45**
C				0			**45**
D				0			**45**
Total	**30**	**30**	**30**	**30**	**30**	**30**	**180**

As it is given that the numbers of stars received by the bloggers from the surfers were all multiples of 5 (including 0), so possible values of stars given to the all the bloggers were any of the values 0 or 5 or 10 or 15 or 25 or 30.

From the 4th point, we can say that the two surfers who gave all their stars to a single blogger must be O and X. Also, that blogger is C and D in any order.
As per point 5, D received more stars than C from Y. This tells us that D got 5 stars from Y and C got 0 stars from Y.

As per point 3, C and D could receive 5 and 15 stars from M in any order.

Now let us assume that C received 5 stars from M. So, D received 15 stars from M. Hence either O or X gave 30 stars to C. Then N has to give 10 stars to C which is not possible as total stars of N will exceed 30 and total stars of D would exceed 45.

This case is shown below in the table:

	M	N	O	P	X	Y	Total
A	10	25	0	5	0	5	**45**
B	0	0	0	25	0	20	**45**
C	5	10	30/0	0	0/30	0	**45**
D	15		0/30	0	30/0	5	**45**
Total	**30**	**30**	**30**	**30**	**30**	**30**	**180**

So, we will the other case which would be valid in which C received 15 stars from M. So, D received 5 stars from M. Hence either O or X gave 30 stars to C and D in any order.
So, we get the final table as follows

	M	N	O	P	X	Y	Total
A	10	25	0	5	0	5	**45**
B	0	0	0	25	0	20	**45**
C	15	0	30/0	0	0/30	0	**45**
D	5	5	0/30	0	30/0	5	**45**
Total	**30**	**30**	**30**	**30**	**30**	**30**	**180**

From the table, we can infer that 2 surfers N and P distributed their stars among exactly 2 bloggers. (N distributed his stars to A and D only and P distributed his stars to A and B only.

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18. Correct Answer – A
Explanation:

It is given that all the six web surfers each had 30 stars. Hence total number of stars = 30 × 6 = 180.
As per the given information and analysing the graph, we can make the initial table:

	M	N	O	P	X	Y	Total
A	10	25	0	5	0	5	**45**
B	0	0	0	25	0	20	**45**
C				0			**45**
D				0			**45**
Total	**30**	**30**	**30**	**30**	**30**	**30**	**180**

As it is given that the numbers of stars received by the bloggers from the surfers were all multiples of 5 (including 0), so possible values of stars given to the all the bloggers were any of the values 0 or 5 or 10 or 15 or 25 or 30.

From the 4th point, we can say that the two surfers who gave all their stars to a single blogger must be O and X. Also, that blogger is C and D in any order.
As per point 5, D received more stars than C from Y. This tells us that D got 5 stars from Y and C got 0 stars from Y.

As per point 3, C and D could receive 5 and 15 stars from M in any order.

Now let us assume that C received 5 stars from M. So, D received 15 stars from M. Hence either O or X gave 30 stars to C. Then N has to give 10 stars to C which is not possible as total stars of N will exceed 30 and total stars of D would exceed 45.

This case is shown below in the table:

	M	N	O	P	X	Y	Total
A	10	25	0	5	0	5	**45**
B	0	0	0	25	0	20	**45**
C	5	10	30/0	0	0/30	0	**45**
D	15		0/30	0	30/0	5	**45**
Total	**30**	**30**	**30**	**30**	**30**	**30**	**180**

So, we will the other case which would be valid in which C received 15 stars from M. So D received 5 stars from M. Hence either O or X gave 30 stars to C and D in any order.
So, we get the final table as follows

	M	N	O	P	X	Y	Total
A	10	25	0	5	0	5	**45**
B	0	0	0	25	0	20	**45**
C	15	0	30/0	0	0/30	0	**45**
D	5	5	0/30	0	30/0	5	**45**
Total	**30**	**30**	**30**	**30**	**30**	**30**	**180**

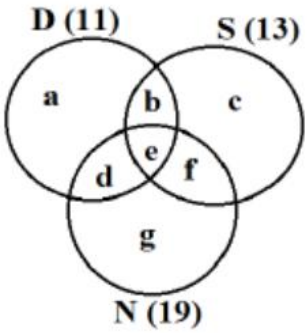
As shown in the table, the number of stars received by C from M can be uniquely determined as 15. But we cannot determine the number of stars received by D from O. They could be either 0 or 30.

19. Correct Answer – 3
Explanation:

As per the bar graph given in the question, we can make a table of number of countries visited by the 3 people:

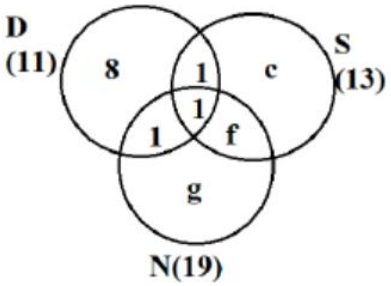
	Dheeraj	Samantha	Nitesh
Asia	3	0	1
Europe	7	9	6
Row	1	4	12
Total	**11**	**13**	**19**

Now we can make Venn Diagram of all the information given and solving the equations to get the values of various variables.

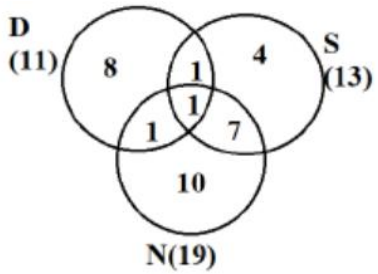


As it is given that 32 countries were visited by at least one of them, we get the equations as
a + b + c + d + e + f + g = 32.....(1)
a + c + g + 2(b + d + f) + 3e = 43....(2)
a + b + d + e = 11
b + c + e + f = 13
d + e + f + g = 19

As per point 2, USA is the only country that was visited by all three of them, so values of e = 1
As per point 3, China is the only country that was visited by both Dheeraj and Nitesh, but not by Samantha, so d = 1.
As per point 4, France is the only country outside Asia, which was visited by both Dheeraj and Samantha, but not by Nitesh, so b = 1.
As a + b + d + e = 11, so a + 1 + 1 + 1 = 11, so a = 8
Also, number of people visiting exactly 3 countries = 1
(2) – (1) gives us b +d + f + 2e = 11. Putting e = 1 gives b + d + f = 9
Hence number of people visiting exactly 2 countries = 9
Since total given is 32, so Exactly 1 + Exactly 2 + Exactly 3 = 32
So, number of people visiting exactly 1 country= 32 – 1 – 9 = 22



As exactly 2 = 9, so 1 + 1 + f = 9
⇒ f = 7
Also, b + c + e + f = 13
⇒ 1 + c + 1 + 7 = 13 ⇒ c = 4
As number of people visiting exactly 1 country is 22, so 8 + c + g = 22
⇒ 8 + 4 + g = 22 ⇒ g = 10
So, we can make the final Venn Diagram as follows



Now we need to make a final table of countries visited by these 3 people in various domains given:

	Only D	Only S	Only N	Only D & S	Only S & N	Only D & N	D & S & N	Total
Asia	2	0	0	0	0	1 (China)	0	**3**
Europe	6	4	2	1(France)	4	0	0	**17**
ROW	0	0	8	0	3	0	1(USA)	**12**
Total	**8**	**4**	**10**	**1**	**7**	**1**	**1**	**32**

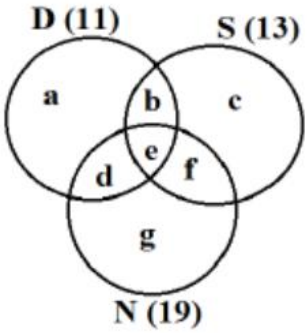
As per point 5, half of the countries visited by both Samantha and Nitesh are in Europe, so number of countries visited by Samantha and Nitesh alone would be $\frac{(7+1)}{2}$ = 4.
As shown in the table above, 3 countries in Asia were visited by at least one of Dheeraj, Samantha and Nitesh.

20. Correct Answer – 2
Explanation:

As per the bar graph given in the question, we can make a table of number of countries visited by the 3 people:

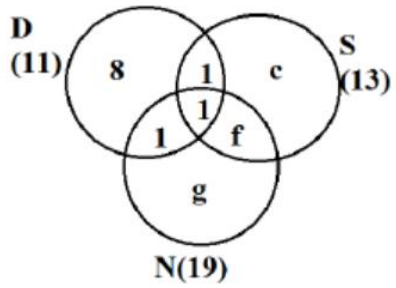
	Dheeraj	Samantha	Nitesh
Asia	3	0	1
Europe	7	9	6
Row	1	4	12
Total	**11**	**13**	**19**

Now we can make Venn Diagram of all the information given and solving the equations to get the values of various variables.



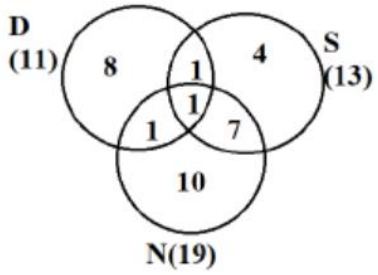
As it is given that 32 countries were visited by at least one of them, we get the equations as
a + b + c + d + e + f + g = 32.....(1)
a + c + g + 2(b + d + f) + 3e = 43....(2)
a + b + d + e = 11
b + c + e + f = 13
d + e + f + g = 19

As per point 2, USA is the only country that was visited by all three of them, so values of e = 1
As per point 3, China is the only country that was visited by both Dheeraj and Nitesh, but not by Samantha, so d = 1.
As per point 4, France is the only country outside Asia, which was visited by both Dheeraj and Samantha, but not by Nitesh, so b = 1.
As a + b + d + e = 11, so a + 1 + 1 + 1 = 11, so a = 8
Also, number of people visiting exactly 3 countries = 1
(2) – (1) gives us b +d + f + 2e = 11. Putting e = 1 gives b + d + f = 9
Hence number of people visiting exactly 2 countries = 9
Since total given is 32, so Exactly 1 + Exactly 2 + Exactly 3 = 32
So, number of people visiting exactly 1 country= 32 – 1 – 9 = 22



As exactly 2 = 9, so 1 + 1 + f = 9
⇒ f = 7

Also, b + c + e + f = 13
⇒ 1 + c + 1 + 7 = 13 ⇒ c = 4
As number of people visiting exactly 1 country is 22, so 8 + c + g = 22
⇒ 8 + 4 + g = 22 ⇒ g = 10
So, we can make the final Venn Diagram as follows



Now we need to make a final table of countries visited by these 3 people in various domains given:

	Only D	Only S	Only N	Only D & S	Only S & N	Only D & N	D & S & N	Total
Asia	2	0	0	0	0	1 (China)	0	**3**
Europe	6	4	2	1(France)	4	0	0	**17**
ROW	0	0	8	0	3	0	1(USA)	**12**
Total	**8**	**4**	**10**	**1**	**7**	**1**	**1**	**32**

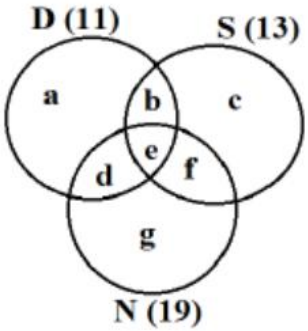
As per point 5, half of the countries visited by both Samantha and Nitesh are in Europe, so number of countries visited by Samantha and Nitesh alone would be $\frac{(7+1)}{2}$ = 4.
As shown in the table above, Nitesh visited 2 countries in Europe alone.

21. Correct Answer – 4
Explanation:

As per the bar graph given in the question, we can make a table of number of countries visited by the 3 people:

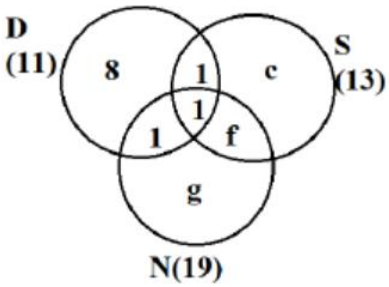
	Dheeraj	Samantha	Nitesh
Asia	3	0	1
Europe	7	9	6
Row	1	4	12
Total	**11**	**13**	**19**

Now we can make Venn Diagram of all the information given and solving the equations to get the values of various variables.



As it is given that 32 countries were visited by at least one of them, we get the equations as
a + b + c + d + e + f + g = 32.....(1)
a + c + g + 2(b + d + f) + 3e = 43....(2)
a + b + d + e = 11
b + c + e + f = 13
d + e + f + g = 19

As per point 2, USA is the only country that was visited by all three of them, so values of e = 1
As per point 3, China is the only country that was visited by both Dheeraj and Nitesh, but not by Samantha, so d = 1.
As per point 4, France is the only country outside Asia, which was visited by both Dheeraj and Samantha, but not by Nitesh, so b = 1.
As a + b + d + e = 11, so a + 1 + 1 + 1 = 11, so a = 8
Also, number of people visiting exactly 3 countries = 1
(2) – (1) gives us b +d + f + 2e = 11. Putting e = 1 gives b + d + f = 9
Hence number of people visiting exactly 2 countries = 9
Since total given is 32, so Exactly 1 + Exactly 2 + Exactly 3 = 32
So, number of people visiting exactly 1 country= 32 – 1 – 9 = 22



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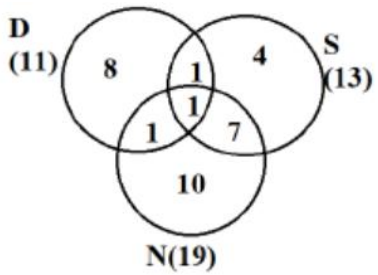

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ROW	0	0	8	0	3	0	1(USA)	**12**
Total	**8**	**4**	**10**	**1**	**7**	**1**	**1**	**32**

As per point 5, half of the countries visited by both Samantha and Nitesh are in Europe, so number of countries visited by Samantha and Nitesh alone would be $\frac{(7+1)}{2} = 4$.

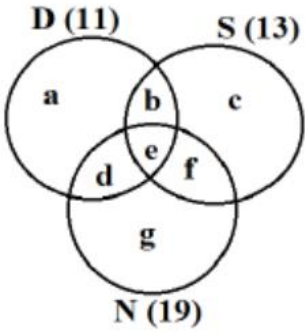
As shown in the table above, 3 + 1 = 4 countries in ROW were visited by both Nitesh and Samantha.

22. Correct Answer – B
Explanation:

As per the bar graph given in the question, we can make a table of number of countries visited by the 3 people:

	Dheeraj	Samantha	Nitesh
Asia	3	0	1
Europe	7	9	6
Row	1	4	12
Total	**11**	**13**	**19**

Now we can make Venn Diagram of all the information given and solving the equations to get the values of various variables.



As it is given that 32 countries were visited by at least one of them, we get the equations as
a + b + c + d + e + f + g = 32.....(1)
a + c + g + 2(b + d + f) + 3e = 43....(2)
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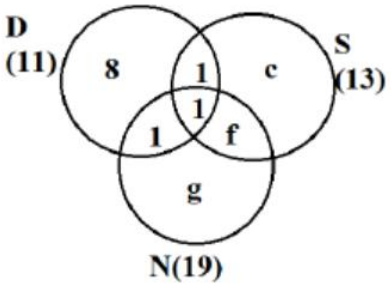
As a + b + d + e = 11, so a + 1 + 1 + 1 = 11, so a = 8
Also number of people visiting exactly 3 countries = 1
(2) – (1) gives us b +d + f + 2e = 11. Putting e = 1 gives b + d + f = 9
Hence number of people visiting exactly 2 countries = 9
Since total given is 32, so Exactly 1 + Exactly 2 + Exactly 3 = 32
So number of people visiting exactly 1 country= 32 – 1 – 9 = 22



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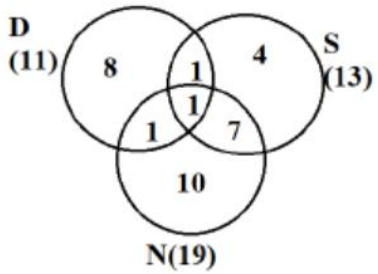

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ROW	0	0	8	0	3	0	1(USA)	**12**
Total	**8**	**4**	**10**	**1**	**7**	**1**	**1**	**32**

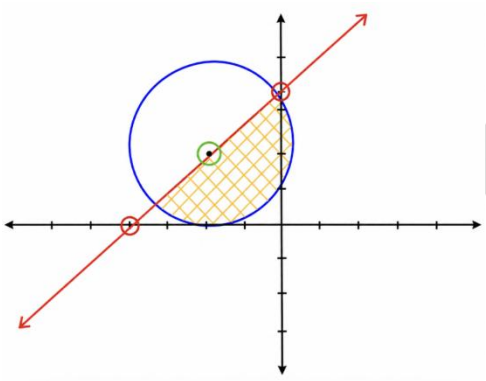
As per point 5, half of the countries visited by both Samantha and Nitesh are in Europe, so number of countries visited by Samantha and Nitesh alone would be $\frac{(7+1)}{2}$ = 4.
As shown in the table above, 6 + 4 + 2 = 12 countries in Europe were visited by exactly one of Dheeraj, Samantha and Nitesh. Hence option B.

Quant

1. Correct Answer – B
Explanation:

The circle is $x^2 + y^2 + 4x - 4y + 4 = 0$
So, its center is $(-2, 2)$ and radius is $r = \sqrt{(-2)^2 + 2^2 - 4} = 2$
The line is $y \geq x + 4$ or $x - y + 4 \leq 0$

Distance from the center $(-2,2)$ to the line $x - y + 4 = 0$ is
$d = \frac{|1(-2) + (-1)(2) + 4|}{\sqrt{1^2 + (-1)^2}} = \frac{|-2 - 2 + 4|}{\sqrt{2}} = 0$
So, the line passes through the center of the circle. That means it divides the circle into two equal halves.



Since the shaded part is one semicircle, its area is $\frac{1}{2}\pi r^2 = \frac{1}{2}\pi(2)^2 = 2\pi$

2. Correct Answer – D
Explanation:

$\left(\frac{1}{8}\right)^k \times \left(\frac{1}{32768}\right)^{1/3} = \frac{1}{8} \times \left(\frac{1}{32768}\right)^{1/k}$.
$\left(\frac{1}{8}\right)^k \times \left(\frac{1}{8^5}\right)^{1/3} = \frac{1}{8} \times \left(\frac{1}{8^5}\right)^{1/k}$
$\left(\frac{1}{8}\right)^{k-1} = \left(\frac{1}{8^5}\right)^{5/k-5/3}$
From this,
$k - 1 = \frac{5}{k} - \frac{5}{3}$.
Rewriting,
$3k^2 + 2k - 15 = 0$.
Hence, the sum of the roots of this quadratic equation is $-\frac{2}{3}$.

3. Correct Answer – 31
Explanation:

Here to form all 4-digit numbers using the distinct non-zero digits a, b, c, d and each digit appears exactly once in each position across all permutations.
The total number of 4 – digit numbers is 4! = 24

Each digit appears 24/4 = 6 times in each place (thousands, hundreds, tens, and units)
For a given digit x, its total contributions are,
x × (1000 + 100 + 10 + 1) × 6 = x × 1111 × 6 = 6666x.
The sum of all numbers is:
6 × 1111 × (a + b + c + d) = 6666 (a + b + c + d).
6666 (a + b + c + d) = 153310 + n,
where n is a single-digit natural number.
Divide 153310 by 6666 ⇒ a + b + c + d = $\frac{153310}{6666}$ = 23 (approx)
⇒ 6666 × 23 = 153318 ⇒ 153310 + n = 153318
⇒ n = 153318 – 153310 = 8
The value of a + b + c + d + n = 23 + 8 = 31

4. Correct Answer – 6
Explanation:

Total number of hours for which Renu worked is 15 × 4 = 60 hours
Total number of hours for which Seema worked is 8 × 5 = 40 hours
Total work is taken as LCM of (60, 40) = 120 units

Efficiency of Renu is $\frac{120}{60}$ = 2 units/hours

Efficiency of Seema is $\frac{120}{40}$ = 2 units/hours
As per the question Renu works 2 hours per day, So Seema works for 4 hours per day.
Total work completed by Renu is 2 × 2 = 4 units/day
Total work completed by Seema is 3 × 4 = 12 units/day
As per the question number of day taken by Renu is double of Seema. Let number of days taken by Seema is 'x' so number of days taken by Renu is '2x'.

Total work will be completed by
4 × 2x + 12x = 120
x = 6 days.

5. Correct Answer – 217
Explanation:

Question is based on GINT, largest integer not exceeding √n.

When n = 1, √1= 1
n = 2, √2= 1
n = 3, √3= 1
n = 4, √4= 2
So, we need to count it like this,
from 1 to 3 we have 1 three times so total will be 1 × 3 = 3
from 4 to 8 we have 2 five times so total will be 2 × 5 = 10
from 9 to 15 we have 3 seven times so total will be 3 × 7 = 21
from 16 to 24 we have 4 nine times so total will be 4 × 9 = 36
from 25 to 35 we have 5 eleven times so total will be 5 × 11 = 55
from 36 to 48 we have 6 thirteen times so total will be 6 × 13 = 78
from 49 to 50 we have 7 two times so total will be 7 × 2 = 14
Hence, answer will be 3 + 10 + 21 + 36 + 55 + 78 + 14 = 217

6. Correct Answer – B
Explanation:

The total surface area of the cuboid is $2(lb + bh + hl)$, which is given to be 846 cm^2.
So, $2(lb + bh + hl) = 846\ cm^2$.
The sum of all the edges of the cuboid is $4(l + b + h) = 144$.
$\Rightarrow l + b + h = 36$ cm.
So, $(l + b + h)^2 = l^2 + b^2 + h^2 + 2(lb + bh + hl)$.
Rearranging,
$l^2 + b^2 + h^2 = (l + b + h)^2 - 2(lb + bh + hl)$.
Substituting the known values,
$l^2 + b^2 + h^2 = 36^2 - 846 = 1296 - 846 = 450$.
The diameter of the sphere = the body diagonal of the cuboid = $\sqrt{l^2 + b^2 + h^2}$.
Therefore, the diameter of the sphere is $\sqrt{450}$ cm.
Thus, the radius of the sphere is $\frac{\sqrt{450}}{2}$ cm.
The volume of the sphere is $\frac{4}{3}\pi R^3 = \frac{4}{3}\pi\left(\frac{\sqrt{450}}{2}\right)^3 = 1125\pi\sqrt{2}\ cm^3$

7. Correct Answer – 31
Explanation:

We have, $4\log_{10} x + 4\log_{100} x + 8\log_{1000} x = 13$
$\Rightarrow 4\log_{10} x + \frac{4}{2}\log_{10} x + \frac{8}{3}\log_{10} x = 13$
$\Rightarrow 4\log_{10} x + 2\log_{10} x + \frac{8}{3}\log_{10} x = 13$
Let $\log_{10} x = k \Rightarrow 4k + 2k + \frac{8}{3}k = 13$
or $12k + 6k + 8k = 39 \Rightarrow k = \frac{3}{2}$
or $\log_{10} x = \frac{3}{2} \Rightarrow x = 10^{3/2} = \sqrt{1000} = 31.62$
So, the greatest integer not exceeding 31.62 = 31

8. Correct Answer – D
Explanation:

We have, $(29 - 12\sqrt{5}) = (a + b\sqrt{n})^2$
$(29 - 12\sqrt{5})$ must be a square of $(x-y)^2$
$(x-y)^2 = x^2 + y^2 + 2xy$
$2xy = 12\sqrt{5}$
$xy = 6\sqrt{5}$
If we take x = 6 and y = $\sqrt{5}$
$(6 - \sqrt{5})^2 = 36 + 5 - 12\sqrt{5} = 41 - 12\sqrt{5}$ (not possible)
If we take x = 3 and y = $2\sqrt{5}$
$(3 - 2\sqrt{5})^2 = 9 + 20 - 12\sqrt{5} = 29 - 12\sqrt{5}$ (possible)
If we take x = $2\sqrt{5}$ and y = 3
$(2\sqrt{5} - 3)^2 = 20 + 9 - 12\sqrt{5} = 29 - 12\sqrt{5}$ (possible)
If we take x = $\sqrt{20}$ and y = 3
$(\sqrt{20} - 3)^2 = 20 + 9 - 12\sqrt{5} = 29 - 12\sqrt{5}$ (possible)
If we take x = $\sqrt{20}$ and y = 3
$(3 - \sqrt{20})^2 = 20 + 9 - 12\sqrt{5} = 29 - 12\sqrt{5}$ (possible)
Positive root: $(a + b\sqrt{n})^2 = (3 - 2\sqrt{5})^2 = a + b + n = 3 - 2 + 5 = 6$

Negative root: $(a + b\sqrt{n})^2 = (2\sqrt{5} - 3)^2 = a + b + n = 2 + 5 – 3 = 4$
Positive root: $(a + b\sqrt{n})^2 = (-3 + \sqrt{20})^2 = a + b + n = -3 + 1 + 20 = 18$
Negative root: $(a + b\sqrt{n})^2 = (3 - \sqrt{20})2 = a + b + n = 3 – 1 + 20 = 22$
As the question asked maximum possible value of positive root so answer is 18.

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9. Correct Answer – C
Explanation:

The best way to solve such questions is to move backwards. In the end he is left with nothing. Just see that to the last person he has given 1/2 of the grains and then 0 grains.
In general person sells 1/2 of the grains and 3 kg more, so the person left with 1/2 of the grains and 3 kg less.
$\frac{x}{2} - 3 = 0$
x = 6 (before giving to third person)
$\frac{x}{2} - 3 = 6$
x = 18 (before giving to second person)
$\frac{x}{2} - 3 = 18$
x = 42 (before giving to first person)
So, the person initially has 42 kg of grains

10. Correct Answer – B
Explanation:

Since, $4(x^2 + y^2 + z^2) = a$ and $4(x - y - z) = 3 + a$
On subtracting both equations we have, $4x^2 - 4x + 4y^2 + 4y + 4z^2 + 4z = -3$
Adding 1 to make it perfect square, we get,
$(4x^2 - 4x + 1) + (4y^2 + 4y + 1) + (4z^2 + 4z + 1) = 0$
$(2x - 1)^2 + (2y + 1)^2 + (2z + 1)^2 = 0$
$\Rightarrow x = \frac{1}{2}$, $y = -\frac{1}{2}$, $z = -\frac{1}{2}$
Now, $4(x^2 + y^2 + z^2) = a$
$= 4\left(\frac{1}{4} + \frac{1}{4} + \frac{1}{4}\right) = a \Rightarrow a = 3$

11. Correct Answer – D
Explanation:

Basically, we are looking for onto function from A to B.
Let n(A) = m, n(B) = n
So, number of onto functions
$= n^m - {}^nC_1(n-1)^m + {}^nC_2(n-2)^m - {}^nC_3(n-3)^m$
$= 3^6 - {}^3C_1(2)^6 + {}^3C_2(1)^6 - {}^3C_3(0) = 540$

12. Correct Answer – C
Explanation:

Let the Initial CP = 100, Initial SP = Initial CP × 140% = 140.
New CP = 60% of 100 = 60, New SP = 150% of 60 = 90.
Difference between the Initial and New selling price is 140 – 90 = 50
Now we need to compare it with actual information as per the question, our 50 is representing 5 Rs as per question. 10 is representing 1Rs, 140 will represent 14 Rs.

13. Correct Answer – 15
Explanation:

Let the four numbers be p, q, r, and s.
By first condition, $\frac{p+q}{2} = p + 1 \Rightarrow q = p + 2$

By second condition, $\frac{p+q+r}{3} = \frac{p+q}{2} + 2 \Rightarrow r = p + 7$

By third condition, $\frac{p+q+r+s}{4} = \frac{p+q+r}{3} + 3 \Rightarrow s = p + 15$
Thus, the numbers are p, p + 2, p + 7 and p + 15.
So, the difference between the largest and the smallest number = p + 15 – p = 15.

14. Correct Answer – A
Explanation:

Since in bank A, $P = 10000$, rate of interest = 5% and let time be T.

$\Rightarrow$ SI $= \frac{PRT}{100} = \frac{10000 \times 5 \times T}{100} = 500T$. Maturity amount $= 10000 + 500T$

Now for bank B, Sum $= 10000 + 500T$, rate of interest = 6% and time = 5 years
$\Rightarrow$ SI $= \frac{(10000 + 500T) \times 6 \times 5}{100} = 3000 + 150T$
Also, the interests received from bank A and bank B are in the ratio 10: 13

$\frac{\text{Interest of bank A}}{\text{Interest of bank B}} = \frac{10}{13} \Rightarrow \frac{500T}{3000 + 150T} = \frac{10}{13}$

$\Rightarrow 13 \times 500T = 10 \times (3000 + 150T) \Rightarrow T = 6$ years

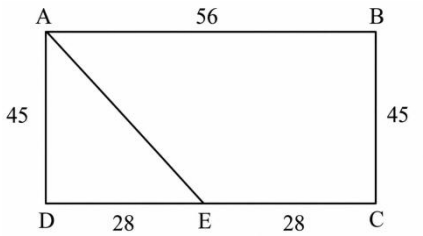
15. Correct Answer – 66
Explanation:

	Apple	Mangos	Oranges
Number of fruits	$5x$	$2x$	$187 - 7x$
Sells	75	26	$\frac{187 - 7x}{2}$

Ratio unsold fruits to unsold oranges = 3: 2
$\frac{5x - 75}{\frac{187 - 7x}{2}} = \frac{3}{2}$
$20x - 300 = 561 - 21x \Rightarrow 41x = 861 \Rightarrow x = 21$

	Apple	Mangos	Oranges
Number of fruits	105	42	40
Sells	75	26	20
Left	30	+16	+20 = 66

16. Correct Answer – 10
Explanation:



ABCD is a rectangle, E is a mid-point of D and C.
$\triangle ADE$ is a right-angle triangle, by applying Pythagorean theorem, $AE = 53$.
Using the formula to calculate area of triangle = radius of incircle × Semi perimeter.
$\frac{1}{2} \times 28 \times 45 = r \times \left(\frac{45+28+53}{2}\right) \Rightarrow r = 10$

17. Correct Answer – 38
Explanation:

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
Let α be the common negative root, then substitute it into each equation we have
$\alpha^2 + m\alpha + 9 = 0$…. (i), $\alpha^2 + n\alpha + 17 = 0$….. (ii) and $\alpha^2 + (m + n)\alpha + 35 = 0$….. (iii)
Subtracting eq. (i) and (ii) we get
$\alpha^2 + n\alpha + 17 - \alpha^2 - m\alpha - 9 = 0 \Rightarrow (n - m)\alpha + 8 = 0$
$\alpha = -\frac{8}{n-m}$ $\alpha^2 + m\alpha + 9 + \alpha^2 + n\alpha + 17 = 0$

$\Rightarrow 2\alpha^2 + (m + n)\alpha + 26 = 0$
Subtract the third equation from the sum of the first and second equations,
we get $2\alpha^2 + (m + n)\alpha + 26 - \alpha^2 - (m + n)\alpha - 35 = 0$
$\alpha^2 - 9 = 0 \Rightarrow \alpha^2 = 9$
$\Rightarrow \alpha = \pm 3$, Since α is negative, $\alpha = -3$
As $\alpha = -\frac{8}{n-m}$

$\Rightarrow -3 = -\frac{8}{n-m} \Rightarrow n - m = \frac{8}{3}$

Substitute, $\alpha = -3$ into the first equation, we get $\alpha^2 + m\alpha + 9 = 0$
$\Rightarrow 9 - 3m + 9 = 0 \Rightarrow m = 6$
Substitute $m = 6$ in $n - m = \frac{8}{3} \Rightarrow n - 6 = \frac{8}{3} \Rightarrow n = \frac{26}{3}$

Now $2m + 3n = 2 \times 6 + 3 \times \frac{26}{3} = 12 + 26 = 38$

18. Correct Answer – B
Explanation:

Let the incomes of Kamal, Amal and Vimal in September be proportional to 8k, 6k, 5k respectively.
The house rent paid by Kamal is 15% of 8k = 1.2k
The house rent paid by Amal is 12% of 6k = 0.72k
The house rent paid by Vimal is 18% of 5k = 0.9k
Their total house rent = 1.2k + 0.72k + 0.9k = 2.82k
In October their house rent remains same while their incomes increase by 10%, 12% and 15% respectively.
Kamal's increased income = 8k × 1.1 = 8.8k
Amal's increased income = 6k × 1.12 = 6.72k
Vimal's increased income = 5k × 1.15 = 5.75k
Total income in October = 8.8k + 6.72k + 5.75k = 21.27k
The house rent remains the same at 2.82k.
The percentage of their total income paid as rent in October = $\frac{2.82k}{21.27k} \times 100 = 13.26\%$ (aprox.)

19. Correct Answer – D

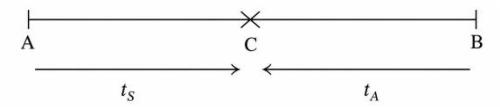
Explanation:

$x_5 = -4$
$a + 4d = -4$.....(i)
$2x_6 + 2x_9 = x_{11} + x_{13}$
$2(x_6 + x_9) = x_{11} + x_{13}$
$x_6 + x_9 = \frac{x_{11}+x_{13}}{2} \Rightarrow x_6 + x_9 = x_{12}$
$a + 5d + a + 8d = a + 11d$
$a + 2d = 0$..... (ii)
Solving equation (i) and (ii),
$a = 4$ and $d = -2$
$x_{100} = a + 99d = 4 + 99 \times (-2) = 4 - 198 = -194$

20. Correct Answer – B
Explanation:

By dilution method, Milk left after nth operation / Total mixture $= \left(1 - \frac{y}{x}\right)^n$
The process repeatedly replaces $\frac{2}{3}$ of the glass's contents with water.
$\Rightarrow$ Milk left after nth operation / Total mixture $= \left(1 - \frac{2}{3}\right)^4 = \left[\frac{1}{3}\right]^4 = \frac{1}{81}$
Initially, the milk fraction is 1 (all milk). After four repetitions, the milk fraction becomes $\frac{1}{81}$
$\Rightarrow$ the fraction of water $= 1 - \frac{1}{81} = \frac{80}{81}$
The final ratio of milk to water is $\frac{1}{81} : \frac{80}{81} = 1:80$

21. Correct Answer – C
Explanation:



Let's assume after meeting at point C Anil takes time t_A and Sunil takes t_S.
As we know, $t = \sqrt{t_A \times t_S}$
As given $t = \frac{3}{2}$, then $t_S = x$, let $t_A = x + \frac{5}{4}$ hours as Anil reaches B exactly 1 hour 15 minutes after Sunil reaches A, $\frac{3}{2} = \sqrt{\left(x + \frac{5}{4}\right) \times x}$
Taking square on both sides and simplify it we have $4x^2 + 5x - 9 = 0$
$\Rightarrow (4x + 9)(x - 1) = 0$,
As we cannot take the negative value, so $x = 1$
Now, $t_A = x + \frac{5}{4} = 1 + \frac{5}{4} = \frac{9}{4}$
Anil's total time was $\frac{3}{2} + \frac{9}{4} = \frac{15}{4}$ h
Speed of Anil $= \frac{45}{15/4} = 12$ km/h

22. Correct Answer – C
Explanation:

By Euler theorem, $\frac{10^{100}}{7} = \frac{(10^6)^{16} \times 10^4}{7} = \frac{1 \times 10^4}{7} \Rightarrow 10000/7$ remainder is 4.