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IPMAT 2024 OFFICIAL PAPER

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QUANTITATIVE ABILITY (SA)

Questions: 15 (+4/0)

Total Test time: 40 mins

- The number of factors of 1800 that are multiple of 6 is _____
- The number of real solutions of the equation $(x^2 - 15x + 55)^{x^2 - 5x + 6} = 1$ is _____
- The following table shows the number of employees and their median age in eight companies located in a district.


Company	Number of employees	Median age
A	32	24
B	28	30
C	43	39
D	39	45
E	35	49
F	29	54
G	23	59
H	16	63

It is known that the age of all employees are integers. It is known that the age of every employee in A is strictly less than the age of every employee in B, the age of every employee in B is strictly less than the age of every employee in C..... the age of every employee in G is strictly less than the age of every employee in H.

The highest possible age of an employee of company A is _____

- In a group of 150 students, 52 like tea, 48 like juice and 62 like coffee. If each student in the group likes at least one among tea, juice and coffee, then the maximum number of students that like more than one drink is _____
- Let ABC be a triangle right-angled at B with AB = BC = 18. The area of largest rectangle that can be inscribed in this triangle and has B as one of the vertices is _____
- A fruit seller has oranges, apples and bananas in the ratio 3:6:7. If the number of oranges is a multiple of both 5 and 6, then the minimum number of fruits the seller has is _____
- The number of pairs (x, y) of integers satisfying the inequality $|x - 5| + |y - 5| \leq 6$ is _____


- The price of a chocolate is increased by x% and then reduced by x%. The new price is 96.76% of the original price. Then x is _____
- Let f and g be two functions defined by $f(x) = |x + |x||$ and $g(x) = \frac{1}{x}$ for $x \neq 0$. If $f(a) + g(f(a)) = \frac{13}{6}$ for some real a, then the maximum possible value of $f(g(a))$ is _____



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in G is strictly less than the age of every employee in H.

The median age of an employee across the eight companies is _____

11. The following table shows the number of employees and their median age in eight companies located in a district.

Company	Number of employees	Median age
A	32	24
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It is known that the age of all employees are integers. It is known that the age of every employee in A is strictly less than the age of every employee in B, the age of every employee in B is strictly less than the age of every employee in C..... the age of every employee

in G is strictly less than the age of every employee in H.

In company F, the lowest possible sum of the ages of all employees is _____

12. If $4^{\log_2 x} - 4x + 9^{\log_3 y} - 16y + 68 = 0$, then $y - x$ equals _____
13. Person A borrows Rs. 4000 from another person B for a duration of 4 years. He borrows a portion of it at 3% simple interest per annum, while the rest at 4% simple interest per annum. If B gets Rs. 520 as total interest, then the amount A borrowed at 3% per annum in Rs. is _____
14. The number of triangles with integer sides and with perimeter 15 is _____
15. If $A = \begin{bmatrix} x_1 & x_2 & 7 \\ y_1 & y_2 & y_3 \\ z_1 & 8 & 3 \end{bmatrix}$ is a matrix such that the sum of


all three elements along any row, column or diagonal are equal to each other, then the value of determinant of A is _____



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QUANTITATIVE ABILITY (MCQ)

Questions: 30 (+4/-1)

Total Test time: 40 mins


16. The angle of elevation of the top of a pole from a point A on the ground is 30° . The angle of elevation changes to 45° , after moving 20 metres towards the base of the pole. Then the height of the pole, in metres, is
- (a) 30 (b) $15(\sqrt{5} + 1)$
 (c) $20(\sqrt{3} + 1)$ (d) $10(\sqrt{3} + 1)$
17. If $|x + 1| + (y + 2)^2 = 0$ and $ax - 3ay = 1$, then the value of a is
- (a) $\frac{1}{5}$ (b) $\frac{1}{2}$
 (c) $\frac{1}{7}$ (d) 2
18. If $\log_4 x = a$ and $\log_{25} x = b$ then $\log_x 10$ is
- (a) $\frac{a+b}{2(a-b)}$ (b) $\frac{a+b}{2}$
 (c) $\frac{a+b}{2ab}$ (d) $\frac{a-b}{2ab}$
19. Let ABC be an equilateral triangle, with each side of length k. If a circle is drawn with diameter AB, then the area of the portion of the triangle lying inside the circle is
- (a) $(3\sqrt{3} + \pi) \left(\frac{k^2}{6}\right)$ (b) $(3\sqrt{3} - \pi) \left(\frac{k^2}{24}\right)$
 (c) $(3\sqrt{3} + \pi) \left(\frac{k^2}{24}\right)$ (d) $(3\sqrt{3} - \pi) \left(\frac{k^2}{6}\right)$
20. Let ABC be a triangle with $AB = AC$ and D be a point on BC such that $\angle BAD = 30^\circ$. If E is a point on AC such that $AD \perp AE$, then $\angle CDE$ equals
- (a) 15° (b) 60°
 (c) 30° (d) 10°
21. If 5 boys and 3 girls randomly sit around a circular table, the probability that there will be at least one boy sitting between any two girls, is
- (a) $\frac{2}{7}$ (b) $\frac{1}{7}$
 (c) $\frac{1}{4}$ (d) $\frac{1}{3}$
22. The side AB of a triangle ABC is c. The median BD is of length k. If $\angle BDA = \theta < 90^\circ$, then the area of triangle ABC is
- (a) $\frac{k^2 \cos 2\theta}{2} + k \sin \theta \sqrt{(c^2 - k^2 \cos^2 \theta)}$
 (b) $\frac{k^2 \sin 2\theta}{2} + k \sin \theta \sqrt{(c^2 - k^2 \sin^2 \theta)}$
 (c) $\frac{k^2 \cos \theta}{4} - k \sin \theta \sqrt{(c^2 + k^2 \sin^2 \theta)}$
 (d) $\frac{k^2 \cos 2\theta}{4} + k \sin \theta \sqrt{(c^2 - k^2 \sin^2 \theta)}$
23. Let $a = \frac{(\log_7 4)(\log_7 5 - \log_7 2)}{(\log_7 25)(\log_7 8 - \log_7 4)}$. Then the value of 5^a is
- (a) $\frac{7}{2}$ (b) 5
 (c) 8 (d) $\frac{5}{2}$
24. For some non-zero real values of a, b and c, it is given that $\left|\frac{c}{a}\right| = 4$, $\left|\frac{a}{b}\right| = \frac{1}{3}$ and $\frac{b}{c} = -\frac{3}{4}$. If $ac > 0$, then $\left(\frac{b+c}{a}\right)$ equals
- (a) 7 (b) -7
 (c) -1 (d) 1
25. The difference between the maximum real root and the minimum real root of the equation $(x^2 - 5)^4 + (x^2 - 7)^4 = 16$ is
- (a) $2\sqrt{5}$ (b) $2\sqrt{7}$
 (c) $\sqrt{7}$ (d) $\sqrt{10}$
26. If θ is the angle between the pair of tangents drawn from the point A $\left(0, \frac{7}{2}\right)$ to the circle $x^2 + y^2 - 14x + 16y + 88 = 0$, then $\tan \theta$ equals
- (a) $\frac{5}{4}$ (b) $\frac{20}{21}$
 (c) $\frac{2}{5}$ (d) $\frac{4}{5}$
27. The numbers 2^{2024} and 5^{2024} are expanded and their digits are written out consecutively on one page. The total number of digits written on the page is
- (a) 1987 (b) 2025

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VERBAL ABILITY AND READING COMPREHENSION**Questions: 45 (+4/-1)****Total Test time: 40 mins**

Directions: (Q.46-Q.51): Read the following passage and choose the answer that is closest to each of the questions that are based on the passage.

Recently, India was in the news again as a world leader – but this time for the wrong reason. According to the Swiss firm IQAir’s assessment of the air quality of world cities 2023, New Delhi is back to being the world’s most polluted capital. New Delhi’s annual air quality rating is 19 times the World Health Organization’s annual limit recommended in 2021 for its pollutant level. The picture is no better as far as the larger Union Territory of Delhi is considered – its annual record of pollutant levels makes it the third most polluted region globally.

Delhi may have hogged the headlines on air pollution, but the problem is far from unique to metropolises. IQAir’s findings reveal that even lower-tier cities and towns in India are choking because of very poor air quality. Indeed, Begusarai in Bihar is the world’s most polluted city. Partly industrialized, housing among others an oil refinery, Begusarai is primarily agrarian. And Begusarai is not an outlier: Mullanpur in Punjab, which is transitioning to an urban settlement, and Siwan in Bihar are among the 42 Indian cities/towns that are among the 50 most polluted globally.

Many judicial pronouncements have upheld “the right to clean air” as a corollary to the fundamental right to life and pushed governments to act. But Delhi’s bad air is despite the introduction of CNG in public transport and the building of a metro network in the early years of this decade, and in spite of the presence of a Graded Response Action Plan (GRAP) that kicks in when the air quality turns bad and becomes more stringent as the air quality worsens.

Improving air quality across Indian cities requires three fundamental changes. One, governments must turn to science to understand, measure, and monitor the problem. Two, they have to understand that the response will have to include behavioural changes and use a combination of incentives and penalties to achieve this. And three, clean air has to be seen as a common public good. To be sure, it is not just the responsibility of the Centre or a battle for courts to wage, but a fight that states and municipal governments have to be a part of. This is the battle for our future.

46. Based on the information in the passage, who has endorsed the right to clean air?
 (a) The government. (b) The courts.
 (c) The media. (d) Parliament.
47. In the last sentence of the passage, “This is the battle for our future”, the writer is
 (a) projecting a bleak future for India.
 (b) being melodramatic.
 (c) being ambivalent.
 (d) emphasizing the need to fight for clean air.
48. Based on the information in the passage, which one of the following statements is correct?
 (a) The problem of air pollution is limited to the major cities in India.
 (b) The 50 most polluted cities in the world are in India.
 (c) Delhi’s air quality is the poorest in the entire world.
 (d) Industrialization makes Begusarai the most polluted city in the world.
49. The first sentence in the passage mentions that India was in the news again as a world leader. What is the writer’s intention in pointing this out?
 (a) To create confusion. (b) To be critical.
 (c) To be negative. (d) To be judgmental.
50. Which of the following points is not made by the writer?
 (a) Governments at all levels should be involved in tackling the problem of air pollution.
 (b) Clean air is the right of every consumer.
 (c) Scientific methods are needed to address the problem of air pollution.
 (d) Polluting behaviour should be punished.
51. The phrase “that kicks in” (para 3) means
 (a) gets rejected. (b) gains importance.
 (c) causes violence. (d) comes into force.

Directions: (Q.52-Q.57): Read the following passage and choose the answer that is closest to each of the questions that are based on the passage.

Anxiety is an emotion that all people experience from time to time, and we do that for good reasons. It has been built into us; we have inherited it from our evolutionary past, because, in general, anxiety has a survival function. It kicks in whenever we sense danger – we freeze, we devote

all of our attention to the danger, and our bodies react with a big release of adrenalin, an increase in blood flow to the muscles, getting us ready to run as fast as we can or fight as fiercely as we might.

Anxiety also helps us to focus on things when we have deadlines and, if someone is driving too fast when we cross the road, it helps us to jump out of the way quickly. So, there is nothing wrong with anxiety in general, and in fact, we would have difficulties if we did not experience it to some extent. However, it can get problematic if the danger is imagined rather than real, or is something that is exaggerated. In those cases, particularly if the perceived danger is out of proportion to the real danger, and it is persistent and disabling, then there is a danger of an anxiety disorder.

Scientists are looking at what role genes play in the development of these disorders and are also investigating the effects of environmental factors such as pollution, physical and psychological stress, and diet. Several parts of the brain are key actors in the production of fear and anxiety. Using brain imaging technology and neurochemical techniques, scientists have discovered that the amygdala plays a significant role in most anxiety disorders. By learning more about how the brain creates fear and anxiety, scientists may be able to devise better treatments for these disorders.

The first psychotherapy treatment that was shown to be effective was 'exposure therapy', which essentially encourages people in a graded way to go into their feared situations and stay in them for as long as they can and build their confidence that way. Another is 'group cognitive behaviour therapy', a talking therapy that helps people to understand the link between negative thoughts and mood and how altering their behaviour can enable them to manage anxiety and feel in control. There are, of course, drugs that can help people with anxiety, but medication will not cure an anxiety disorder, it can only help to keep it under control while the person receives psychotherapy.

There is plenty of evidence that exercise can help with anxiety problems. When stress affects the brain, with its many nerve connections, the rest of the body feels the impact as well. Exercise and other physical activity produce endorphins, which are chemicals in the brain that act as natural painkillers. Additionally, getting physically tired can help people fall asleep faster and have deeper, more relaxing sleep. As many people suffering from anxiety often have problems with insomnia, just the

ability to get a good night's rest can change their perspectives.

Anxiety is a normal but highly subjective human emotion. While normal anxiety serves a beneficial and adaptive purpose, it can also become the cause of tremendous suffering for millions of people. It is important that people recognise excessive anxiety in themselves at the earliest, as treatment can be very successful. Leaving it untreated can be a misery.

52. Which of the following best indicates the relationship between anxiety and survival?
- Despite being inherited from our evolutionary past, anxiety frequently undermines survival as it is not an integral part of human nature.
 - Anxiety is part of our evolutionary past, yet has limited relevance now as it does not significantly impact our chances of survival.
 - Anxiety is ingrained within us due to our evolutionary heritage and generally serves to promote survival.
 - Anxiety, an intrinsic part of human nature, often disrupts our ability to thrive by acting as an impediment to survival.
53. In what way might the relationship between exercise or physical activity and anxiety relief suggest a potential solution for individuals with anxiety disorders?
- Physical activity serves as a temporary distraction from anxiety, but its long-term effects remain unclear.
 - Exercise-induced endorphins facilitate cognitive behavioural therapy's effectiveness.

- (c) Exercise may directly target the amygdala to reduce anxiety symptoms.
- (d) Physical activity could enhance sleep quality, indirectly lessening anxiety symptoms.
54. In the passage, the information about anxiety treatments is organized in which of the following ways?
- (a) By comparing different types of anxiety disorders.
- (b) By presenting contrasting viewpoints on the subject.
- (c) By outlining the historical development of anxiety treatments.
- (d) By discussing various treatment options and their effectiveness.
55. Based on the information in the passage, which of the following statements best describes the potential danger associated with anxiety disorder?
- (a) It is always indicative of an imagined danger rather than a real one.
- (b) It is characterized by a persistent and exaggerated perception of danger.
- (c) It occurs when the perceived danger is proportionate to the real danger.
- (d) It primarily arises from genetic factors rather than environmental influences.
56. The passage is chiefly concerned with
- (a) investigating the physiological benefits of exercise on anxiety management.
- (b) evaluating the effectiveness of psychotherapy and medication in treating anxiety.
- (c) understanding the complex interplay between genetic and environmental factors in anxiety disorders.
- (d) exploring the multifaceted nature of anxiety and its adaptive functions.
57. Based on the information in the passage, which one of the following statements is correct?
- (a) Regular exercise does little to alleviate anxiety symptoms and improve sleep quality.
- (b) Exposure therapy encourages individuals to face their feared situations gradually.
- (c) Cognitive behaviour therapy is the most preferred treatment for anxiety disorders.
- (d) Medication is the first-line therapy and primary cure for anxiety disorders.
58. My supervisor seemed to be in a bad mood because he _____ when I asked if I could leave an hour early.
- (a) ate my head (b) cut my voice
- (c) bit my head off (d) hit my ear off
59. In a circus where performers share dressing rooms, training spaces and work in a fastpaced environment, the success of a show _____ fostering team-work and collaboration.
- (a) comes with (b) come along with
- (c) comes down to (d) comes about
60. Anil could not go to his friend's party, as he had fever and was _____.
- (a) beneath the weather (b) under the weather
- (c) outside the weather (d) beside the weather
61. In his address to the candidates contesting the student council elections the Principal said, "If you want others to take you seriously then you must _____ on issues like gender bias and inclusivity."
- (a) rule the roost (b) walk the talk
- (c) read the lines (d) go around the bend
62. The students' picnic plans _____ when it started raining heavily in the morning.
- (a) dropped out (b) dropped off
- (c) fell through (d) fell behind
63. All the employees agreed that the new regulations had _____ positive changes in the workplace.
- (a) brought up (b) brought on
- (c) brought along (d) brought about
64. Sheila keeps interrupting Manohar when he is playing with his friends, but he _____ because she is his younger sister.
- (a) puts her off (b) puts up with her
- (c) puts along with her (d) puts her on

Directions: (Q.65-Q.69):

In each of the following sentences, the incorrect part of the sentence is underlined. Choose an alternative from the four given options so that the sentence is rendered correct.

65. He is very careless and has loosed his keys all the time.
- (a) was losing his keys (b) is loosing his keys
- (c) loses his keys (d) has loses his keys
66. I had been having a headache, so I will not attend the meeting.
- (a) was having a headache (b) have a headache
- (c) used to have a headache (d) have headache



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67. The negotiations are unsuccessful, and the Boards' hopes to continuing talks on a future deal seems to be increasingly improbable.
- Board's hopes to continuing talks on a future deal seem
 - Boards' hopes to continued talks on a future deal seems
 - Boards' hopes on continued talks on a future deal seem
 - Board's hopes to continuing talks on a future deal seems
68. In my opinion, the psychological thrillers of Alfred Hitchcock, who is a master of suspense and horror, have more lasting impact than any other filmmaker in history.
- are having more lasting impact than those of other filmmakers
 - has had a more lasting impact than those of other filmmakers
 - have had a more lasting impact than those of any other filmmaker
 - had more lasting impact than any filmmaker
69. While the bustling city streets were filled with the cacophony of honking horns and chatter of pedestrians, the serene countryside, where time seemed to move at a slower pace, provide a welcome retreat for their seeking solace amidst the chaos of urban living.
- provides a welcome retreat for them seeking solace
 - provides a welcoming retreat for those seeking solace
 - provided a welcome retreat for those seeking solace
 - provided a welcoming retreat for who seek solace
- Directions: (Q.70-Q.73)**
Each of the paragraphs given below has a sentence missing which is indicated by a blank.
- From the choices given below each paragraph, choose the sentence that seems most logically appropriate to complete the paragraph.
70. Most artificial intelligence (AI) applications in the fields of healthcare, industry, finance, transportation, and writing, rely heavily on deep learning and natural language processing. However, while AI systems can mimic existing styles and patterns, there is an ongoing debate about whether AI can truly possess creativity in the same sense as humans. _____.
- Man has long feared the rise of the machine, his own creation becoming smarter and more intelligent than him
 - AI-generated works may lack the depth, emotional connection, and unique perspectives that come with human experiences and emotions
 - AI usage raises a number of ethical concerns such as privacy issues, bias in algorithms, and the potential misuse of AI in many applications
 - High-performance computing has already proven a machine's ability to perform advanced calculations far faster and more accurately than the human mind
71. In an era where privacy and individualism are often prized above all else, Japanese architect Riken Yamamoto blurs the boundary between public and private. _____.
- His work is a testament to the power of architecture to break down barriers and to foster a sense of community. Through his innovative designs, he challenges traditional notions of public and private spaces, seamlessly blending the two realms.
- He successfully integrates traditional Japanese aesthetics and modern design principles in his work

- (b) He was recently named the 2024 Laureate of the prestigious Pritzker Architecture Prize
- (c) In the world of architecture, he stands out as a visionary voice advocating a return to a more interconnected way of living
- (d) He is deeply committed to building harmonious societies through his architectural practice
72. The pursuit of a career in sports offers individuals opportunities for personal fulfilment and professional success. _____ . Athletes must therefore undergo rigorous training regimens to maintain peak physical condition and hone their skills. Additionally, competition in the sports industry is fierce, requiring dedication, perseverance, and mental resilience to succeed. Despite the challenges, successful athletes can enjoy lucrative contracts, endorsements, and global recognition for their achievements.
- (a) Sports careers are often short-lived due to the physical demands and risks of injury associated with athletic competition
- (b) Athletes often face pressure from coaches, sponsors, and fans to perform at their best, adding to the stress of professional sports
- (c) The sports industry encompasses a wide range of career paths, including coaching, sports management, and sports journalism
- (d) Many athletes choose to pursue higher education alongside their sports careers to ensure long-term stability and success
73. _____. This happened after a lorry laden with tomatoes worth 21 lakh rupees went missing. One of the three traders who had sent his tomatoes on the lorry said that they had lost contact with the driver in Nashik and that his GPS had been switched off. The traders were not sure if the truck had been hijacked or if the driver had stolen the tomatoes. This is the third time tomatoes have been stolen following the rise of tomato prices to Rs.150 per kg.
- (a) Nashik overtook Kolar as the biggest tomato market in Asia
- (b) Panic and confusion reigned among traders in the Kolar agricultural produce market
- (c) A couple took the hijacked vehicle to a nearby market and sold the tomatoes there
- (d) Three traders jointly hired a lorry to carry tomatoes

Direction: (Q.74-Q.79)

Some of the sentences below have words that are missing. Choose the best option from those given below to complete them.

74. An _____ found that one of the marathon runners had _____ slowed down in the last two kilometres and after _____ to the one behind him had let him cross the finish line just one second before he did.
- (a) analysis; systematically; waving
- (b) overview; purposely; beckoning
- (c) investigation; deliberately; signalling
- (d) appraisal; particularly; speaking

75. The outbreak of COVID-19 resulted in a health crisis and a drop in economic activity that were without _____ in history. While containing and _____ the spread of the virus was the first priority of public authorities, reducing the _____ of the disease and limiting the pressure on healthcare systems were also considered equally important.
- (a) similarity; combating; prevalence
- (b) precedent; mitigating; incidence
- (c) equivalent; eradicating; toll
- (d) parallel; controlling; outbreak
76. In today's fast-paced world, individuals are inundated with information, necessitating the cultivation of

critical thinking skills in order to navigate the influx of data _____.

Additionally, the prevalence of fake news and misinformation presents a _____ challenge, undermining people's trust in media and institutions. Promoting media literacy and cultivating a culture of scepticism are vital for _____ informed citizenship and democratic values.

- (a) judiciously; systematic; inhibiting
- (b) discerningly; pervasive; fostering
- (c) discreetly; global; serving
- (d) thoughtfully; holistic; furthering

77. Conspiracy theorists suggest that if climate change is slowly turning the planet into an oven, then this must have been the outcome of our enemies' intentional _____. If there are no coincidences in the world, then everything, including _____ events, can be controlled. It is only a matter of power and _____.

- (a) machinations; outstanding; determination
- (b) errors; indescribable; information
- (c) plotting; catastrophic; prowess
- (d) inaction; advantageous; performance

78. It is widely argued that social media can benefit aspiring _____. Populists in particular latch on to social media today as a way to connect directly with people, _____ restraints on their behaviour that political parties would have provided in the pre-internet age. They can also profit from echo chambers, which reinforce the sense that a whole people _____ supports a populist leader.

- (a) autocrats; bypassing; uniformly
- (b) entrepreneurs; enforcing; presumably
- (c) anarchists; unscrupulous; unanimously
- (d) democrats; avoiding; surprisingly

79. In an era of globalization, cultural diversity is celebrated and valued across societies. However, the rise of xenophobia and intolerance poses a _____ challenge to social cohesion and harmony. Building inclusive communities and promoting intercultural dialogue are essential for _____ mutual understanding and respect among diverse populations. Additionally, educating individuals about the benefits of cultural diversity and challenging _____ are crucial steps toward creating inclusive societies and encouraging peaceful coexistence.

- (a) complicated; advancing; truisms
- (b) multi-faceted; stimulating; archetypes
- (c) pressing; nurturing; stereotypes

(d) sophisticated; expediting; propositions

80. One of the statements below contains a word used incorrectly or inappropriately. Choose the option which has the incorrect or inappropriate usage of the word.

- (a) When it is not too thick, the callus protects the foot from damage.
- (b) A build-up of the callus is one of the most common causes of discomfort.
- (c) He received fifty lashes on his feet delivered with callus indifference.
- (d) The doctor examined the callus but neglected to treat it

81. One of the statements below contains a word used incorrectly or inappropriately. Choose the option which has the incorrect or inappropriate usage of the word.

- (a) He used a fan to diffuse the smoke that had accumulated in the kitchen while cooking.
- (b) Every morning, the aroma of freshly baked bread diffuses throughout the house, enticing everyone to the kitchen.
- (c) Realising that the argument between the two groups of students was getting out of control, the teacher diffused the situation by quickly changing the topic.
- (d) The stained glass diffused the light filtering through the windows.

82. One of the statements below contains a word used incorrectly or inappropriately. Choose the option which has the incorrect or inappropriate usage of the word.

- (a) Bans provide the community a chance to raise objections and ensure transparency.
- (b) Organic farming bans the usage of all pesticides and involves manual weeding.
- (c) The government bans anyone with irregularities in their passports from travelling abroad.
- (d) The Child Marriage Restraint Act bans the marriage of those who are below 18 years of age.

83. One of the statements below contains a word used incorrectly or inappropriately. Choose the option which has the incorrect or inappropriate usage of the word.

- (a) During her summer holidays she usually went to the village to stay with her grandparents and her large extended family.
- (b) She said, "I always stay awake late into the night till my daughters come home, as I worry a lot about their safety."

- (c) The ownership of the property went to the eldest son of the family, but the other siblings went to court and asked for a stay order.
- (d) Due to the ban on slaughter of cattle, the neglected ones often stay away, wandering into fields and eating the crops.
- 84.** One of the statements below contains a word used incorrectly or inappropriately. Choose the option which has the incorrect or inappropriate usage of the word.
- (a) The rules of the organization proscribes members from engaging in conflicts of interest.
- (b) The coach proscribes late night parties before an important game.
- (c) The company's policy proscribes employees from disclosing confidential information to unauthorized individuals.
- (d) The software manual proscribes step-by-step instructions for installing and configuring the program.
- 85.** One of the statements below contains a word used incorrectly or inappropriately. Choose the option which has the incorrect or inappropriate usage of the word.
- (a) The sound of laughter and loud music from the neighbour's house disturbed his train of thought as he was writing his farewell speech.
- (b) If you really want to see the landscape and the scenic countryside, it is better to take a train or go by road, rather than by plane.
- (c) By following the train of blood on the platform the police located the body of a young woman who had been brutally stabbed.
- (d) My friend has picked up a stray dog from the street and is now looking for somebody to train and domesticate the animal.
- 86.** The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the most logical order and enter the sequence of numbers in the space provided. Only numbers are to be entered in the space provided for the answer, and no letters, characters, or spaces should be entered. For example, a response such as 53412 is valid, and responses such as 53412. or 53 41 2 are invalid.
1. By contrast, in America, it is estimated that even after post-COVID decline, total giving came to almost \$ 500 billion in 2022.
 2. There are no comparable data on different countries. But one report by Dasra, a Mumbai-based NGO, estimates total private giving in India came to about \$ 13 billion in 2022.
 3. A strategic sort of giving, involving philanthropy professionals, a long-term lens, and big ambitions of transforming society is gradually emerging. It differs, of course, between countries.
 4. Researchers at the Chinese Academy of Social Sciences, put total giving in China at \$ 21 billion in 2020.
 5. By any measure, however, organised philanthropy across Asia is on a much smaller scale than in the West.
- 87.** The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the most logical order and enter the sequence of numbers in the space provided. Only numbers are to be entered in the space provided for the answer, and no letters, characters, or spaces should be entered. For example, a response such as 3412 is valid, and responses such as 3412. or 3 41 2 are invalid.
1. Farmers, however, especially during the peak farming season, ignore the warnings of the weather forecast.
 2. People from some states of India have demanded that families of those who have been killed by lightning strikes should receive compensation.
 3. The Minister for Disaster Management announced that over 2800 people have died after being struck by a lightning last year.
 4. The Minister responded that pamphlets on the dangers of lightning and precautions to be taken are being distributed in villages.

- 88.** The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the most logical order and enter the sequence of numbers in the space provided. Only numbers are to be entered in the space provided for the answer, and no letters, characters, or spaces should be entered. For example, a response such as 53412 is valid, and responses such as 53412. or 53 41 2 are invalid.
1. Meanwhile, people are posting less. The share of Americans who say they enjoy documenting their life online has fallen from 40 per cent to 28 per cent since 2020.
 2. The striking feature of the new social media is that they are no longer very social.
 3. Some of the consequences of this are welcome. Political campaigners say they have to tone down their message to win over private groups.
 4. Debate is moving to closed platforms such as WhatsApp and Telegram.
 5. Inspired by TikTok, apps like Facebook increasingly serve a diet of clips selected by artificial intelligence according to a user's viewing behaviour, not their social connections.
- 89.** The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the most logical order and enter the sequence of numbers in the space provided. Only numbers are to be entered in the space provided for the answer, and no letters, characters, or spaces should be entered. For example, a response such as 3412 is valid, and responses such as 3412. or 3 41 2 are invalid.
1. In this microgravity environment, your blood also tends to move towards the heart and head.
 2. Both effects are only short-lived and, after a brief period of readjustment on arriving back home, the heart and spine return to normal.
 3. The heart interprets this as an increase in the amount of blood in the body and that it needs to pump less, so it shrinks.
 4. In space with less gravitational force than on Earth, there's less pressure on your spine and so it'll get a bit longer, effectively making you as much as two inches taller.
- 90.** The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the most logical order and enter the sequence of numbers in the space provided. Only numbers are to be entered in the space provided for the answer, and no letters, characters, or spaces should be entered. For example, a response such as 3412 is valid, and responses such as 3412. or 3 41 2 are invalid.
1. The muddy concoction – made by grinding the kava plant's roots and mixing it with water to create a dark, earthy liquid – holds a deep cultural significance throughout the region, and the drink is often shared between friends, guests, and colleagues.
 2. Regular kava drinkers often describe this blissful state as a sort of peace, a way for the body and mind to uncoil from itself.
 3. Called yaqona in Fiji, 'ava in Samoa and sakau in Micronesia, kava has occupied a sacred role in Pacific countries for centuries.
 4. A swig (or two) taken from a bowl or shell – sometimes quite literally a coconut shell cut in half – can lead to profound relaxation, a sort of numbness that trickles down from your mouth through your shoulders and spine.

SuperGrads Study Material

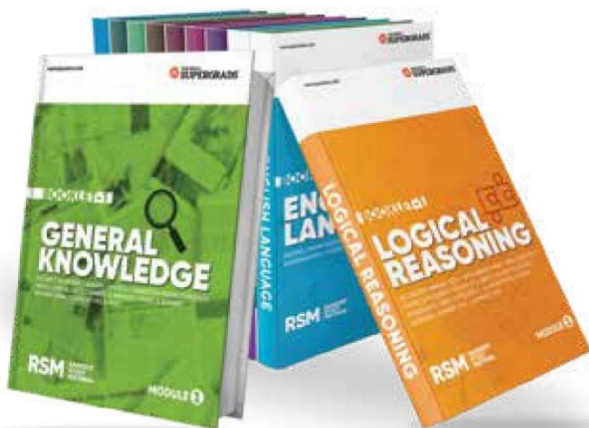
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SURESHOT PRACBOOK



RANKERS' STUDY MATERIAL



MOCK ANALYSIS COPY



ANSWER KEY AND EXPLANATIONS

QUANTITATIVE ABILITY (SA)

1. **(18)** $1800 = 2^3 \times 3^2 \times 5^2$
 $= 2 \times 3 \times (2^2 \times 3^1 \times 5^2)$
 $= 6 \times (2^2 \times 3^1 \times 5^2)$
 Number of factors of 1800 which are also multiple of 6
 $=$ Number of factors of the highlighted part of the number
 $= (2 + 1)(1 + 1)(2 + 1)$
 $= 3 \times 2 \times 3 = 18$. Ans

2. **(6)** $(x^2 - 15x + 55)^{x^2 - 5x + 6} = 1$
 For real solution there are three cases possible:

Case I: (any integer)⁰ = 1

$\therefore x^2 - 5x + 6 = 0$
 $\Rightarrow (x - 2)(x - 3) = 0$
 $\Rightarrow x = 2$ or 3

Case II: (1)^{any integer} = 1

$\therefore x^2 - 15x + 55 = 1$
 $\Rightarrow x^2 - 15x + 54 = 0$
 $\Rightarrow (x - 9)(x - 6) = 0$
 $\Rightarrow x = 6$ or 9

Case III: (-1)^{any even integer} = 1

$\therefore x^2 - 15x + 55 = -1$
 $\Rightarrow x^2 - 15x + 56 = 0$
 $\Rightarrow (x - 7)(x - 8) = 0$
 $\Rightarrow x = 7$ or 8

But we need to check whether the exponent $x^2 - 5x + 6$ is even or not for $x = 7$ & 8 .

Putting $x = 7$ in $x^2 - 5x + 6$ we get 20, which is even.

Putting $x = 8$ in $x^2 - 5x + 6$ we get 30, which is again even.
 Thus both 7 and 8 are valid solutions, as well.

\therefore Total the total number of real solutions for the given equation is 6 i.e (2, 3, 6, 9, 7, 8) Ans.

3. **(29)** Median is defined as the positional mean of the given values.

Company	Number of employees	Min. possible age of employee	Median	Max. possible age of employee
A	32	x	24	29
B	28	30	30	30

Highest possible age of an employee of company A can be 29.

This is possible when the least possible age of any employee is 30 years, which is feasible in the given scenario. (when the age of 15 employees each is equal to 30).

4. **(12)** We know, $n(T \cup J \cup C) = x + y + z$... (i)
 and also, $n(T) + n(J) + n(C) = x + 2y + 3z$... (ii)
 where, x, y and z represent number of students who drink exactly, one, exactly two and all three drinks.

We have to find out the maximum number of students that like more than one drink. It means those students who like exactly two or exactly three drinks i.e. the maximum possible value of $y + z$.

Given $n(T \cup J \cup C) = 150$; $n(T) = 52$; $n(J) = 48$; $n(C) = 62$

Subtracting (i) from (ii), we get

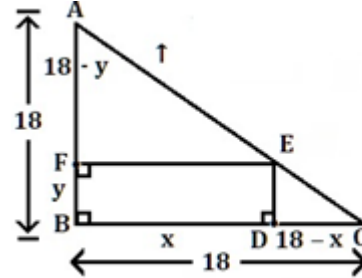
$n(T) + n(J) + n(C) - n(T \cup J \cup C) = y + 2z$

$\Rightarrow 162 - 150 = (y + z) + z$

$\Rightarrow 12 = (y + z) + z$

\Rightarrow The maximum value of $(y + z)$ can be 12, when is z is 0 & y is 12. Ans.

5. **(81)**



Let $BD = x, BF = y$

We have to find maximum value of area of rectangle BDEF i.e. maximum value of $x \cdot y$.

Let the area of rectangle BDEF, $A = x \cdot y$... eqn. (i)

$\triangle AFE \sim \triangle ABC$ (AA criteria)

$\therefore \frac{AF}{AB} = \frac{FE}{BC}$

$\frac{18 - y}{18} = \frac{x}{18} \Rightarrow y = x - 18$... eqn. (ii)

Putting $y = x - 18$ in eqn. (i), we get -

$A = x(x - 18)$

$A = x^2 - 18x$

Differentiating A w.r.t x, we get $\frac{dA}{dx} = 2x - 18$

Equating $\frac{dA}{dx}$ to 0, in order to get the value x for which area,

A will be maximum, we get

$\frac{dA}{dx} = 2x - 18 = 0 \Rightarrow x = 9$.

$\therefore x = y = 9 \therefore$ Maximum area of rectangle BDEF = $x \cdot y$

$= 9 \times 9 = 81$ Ans.

6. **(160)** Let the number of oranges, apples and bananas be $3x, 6x$ and $7x$.

As the number of oranges is multiple of both 5 & 6 i.e. 30 (LCM of 5 & 6 is 30). Their minimum number could be 30 only.

$\therefore 3x = 30$

Hence $x = 10$ (minimum)

For minimum number of total fruits = $3x + 6x + 7x = 16x \Rightarrow 16 \times 10 = 160$. Ans

7. **(85)** Taking $x - 5 = X$ and $y - 5 = Y$, we get $|X| + |Y| \leq 6$

Here, if x and y are integers, then X and Y will also be integers.

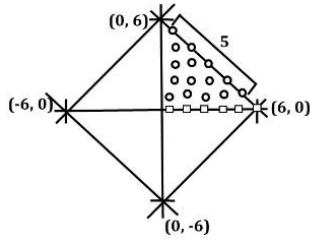
Case I: $X + Y \leq 6$

Case II: $X - Y \leq 6$

Case III: $-X + Y \leq 6$

Case IV: $-X - Y \leq 6$

Plotting the graphs of above inequalities:



Counting the number of integral coordinates (X, Y) in the 1st quadrant, we get 5 + 4 + 3 + 2 + 1 = 15 points. (as shown in the diagram)

So, in all 4 quadrants, total number of points with integral coordinates will be 15 × 4 = 60 points.

Now, counting the number of points with integral coordinate (X, Y) on +x-axis, we get, 6 points.

So, total points on all 4-axes, 6 × 4 = 24 points. Also, the origin (0,0).

Total number of points (X, Y) with integral coordinates satisfying all the 4 inequalities = 60 + 24 + 1 = 85.

Thus, the corresponding pairs of (x, y) will also be 85. Ans.

8. **(18)** Let the original price of chocolates be P.

Final price = Original Price × MF₁ × MF₂

Here, MF is multiplying factor and it is equals to (1 + % change) in case of increase & equals (1 - % change) in case of decrease.

∴ Final price = Original price × (1 + x%) × (1 - x%)

$$\Rightarrow 96.76\%P = P [1 - (x\%)^2]$$

$$\Rightarrow 96.76\% P = P - P (x\%)^2$$

$$\Rightarrow 96.76\% P = 100\% P - (x\%)^2 P$$

$$\Rightarrow 96.76 = 100 - x^2\%$$

$$\Rightarrow x^2\% = 3.24$$

$$\Rightarrow x^2 = 324$$

$$\Rightarrow x = 18 \text{ Ans.}$$

9. **(6)** $f(x) = |x + |x||$ and $g(x) = \frac{1}{x}$ for $x \neq 0$.

$$\text{Given } f(a) + g(f(a)) = \frac{13}{6}$$

$$\Rightarrow f(a) + \frac{1}{f(a)} = \frac{13}{6}$$

$$\Rightarrow [f(a)]^2 + 1 = f(a) \cdot \frac{13}{6}$$

$$\Rightarrow 6[f(a)]^2 + 6 = 13 \cdot f(a)$$

$$\Rightarrow \text{let } f(a) = t$$

$$\therefore 6t^2 - 13t + 6 = 0.$$

Solving above quadratic equation, we get, $t = f(a) = \frac{3}{2}$ or $\frac{2}{3}$

Case I: If $f(a) = \frac{3}{2}$

$$\therefore |x + |x|| = \frac{3}{2}$$

$$\Rightarrow x + |x| = \frac{3}{2} \text{ or } -\frac{3}{2} \text{ -----eqn. (i)}$$

We know $|x| = +x$ for $x > 0$ & $|x| = -x$ for $x < 0$,

Taking $x < 0$ will not lead to any solution of x. So, taking $x > 0$, and substituting $|x|$ with $+x$ in eqn.(i), we get

$$x + x = 2x = \frac{3}{2} \text{ or } -\frac{3}{2}$$

We will get, $x = \frac{3}{4}$ (valid) & $x = -\frac{3}{4}$ (invalid)

Case II: If $f(a) = \frac{2}{3}$

$$\therefore |x + |x|| = \frac{2}{3}$$

$$\Rightarrow x + |x| = \frac{2}{3} \text{ or } -\frac{2}{3}$$

When $x > 0$, $|x| = +x$,

Substituting in eqn.(i) we get, $x + x = 2x = \frac{2}{3}$ or $-\frac{2}{3}$

$$x = \frac{2}{6} = \frac{1}{3} \text{ (valid) or } -\frac{2}{6} = -\frac{1}{3} \text{ (invalid)}$$

$$\text{Now, } f(g(a)) = |g(a) + |g(a)|| = \left| \frac{1}{x} + \left| \frac{1}{x} \right| \right|$$

$$\text{For } x = \frac{3}{4} \Rightarrow f(g(a)) = \left| \frac{4}{3} + \left| \frac{4}{3} \right| \right| = \frac{8}{3} \text{ and for } x = \frac{1}{3} \Rightarrow f(g(a)) =$$

$$\left| 3 + |3| \right| = 6$$

So, the maximum value of $f(g(a)) = 6$. Ans

10. **(45)** Total number of employees = 32 + 28 + 43 + 39 + 35 + 29 + 23 + 16 = 245

Median age of all these employees = age of the employee at the middle most position when all the employees are arranged in ascending/ descending order of their age.

$$\text{Middle position will be } \frac{245+1}{2} = 123$$

∴ The age of employee whose position is 123rd.

Adding, number of employees of companies A, B and C = 32 + 28 + 43 = 103.

To reach 123rd position, we need to add 20 employees of company D.

We know, the age of 20th employee of company D = median age of the employees of the company D = 45 years. (Here, 20th position will be the middle most position when all 39 employees are arranged in ascending / descending order of their age)

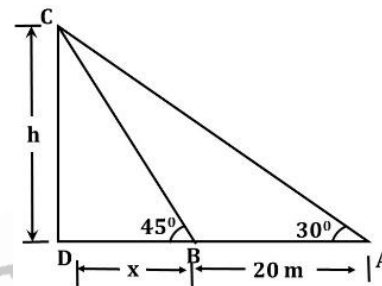
Therefore, median age of an employee across all eight companies = 45 years. Ans.

11. **(1510)** Lowest possible sum of ages of all the employees of company F, is only possible when the maximum possible age of any employee of company E is 49 and not more. In that case, the minimum possible age of employees of company F, can be 50.
Now, company F has 29 employees with median 54. That means there can be 14 employees with age 50 each and 15 employees with age 54 each.
 \therefore Sum total of age of 29 employees company F = $14 \times 50 + 15 \times 54 = 700 + 810 = 1510$. Ans
12. **(6)** $4^{\log_2 x} - 4x + 9^{\log_3 y} - 16y + 68 = 0$
 $\Rightarrow x^{\log_2 4} - 4x + y^{\log_3 9} - 16y + 68 = 0$
 $= 0$ {Using property: $a^{\log_m x} = x^{\log_m a}$ }
 $\Rightarrow x^2 - 4x + y^2 - 16y + 68 = 0$
 $= 0$ {Using property: $\log_x a^m = m \cdot \log_x a$ & $\log_a a = 1$ }
 $\Rightarrow (x^2 - 4x + 4) + (y^2 - 16y + 64) = 0$
 $= 0$ {68 is splitted as 4 + 64}
 $\Rightarrow (x - 2)^2 + (y - 8)^2 = 0$
The sum of two perfect squares equal to zero only possible if each term is zero.
 $\therefore (x - 2)^2 = 0 \Rightarrow x - 2 = 0 \Rightarrow x = 2$
and $(y - 8)^2 = 0 \Rightarrow y - 8 = 0 \Rightarrow y = 8$
 $\therefore y - x = 8 - 2 = 6$. Ans
13. **(3000)** Let the first portion borrowed at 3% p.a. SI be Rs. x and the other portion borrowed at 4% p.a. be Rs. $(4000 - x)$
 \therefore Total interest = $SI_1 + SI_2$
 $\Rightarrow 520 = \frac{x \times 3 \times 4}{100} + \frac{(4000 - x) \times 4 \times 4}{100}$
 $\Rightarrow 13000 = 3x + 16000 - 4x$
 $\Rightarrow x = 3000$
 \therefore Amount borrowed at 3% p.a. SI was Rs.3000. Ans.
14. **(7)** **One equilateral triangle with sides (5, 5, 5)**
Three isosceles triangles (7, 7, 1), (6, 6, 3) and (4, 4, 7)
{Reason: The measure of two equal sides cannot be less than 4 or more than 7. Taking two equal sides as 8 will make sum of these two sides only as 16, more than the perimeter. Taking two equal sides as 3 each, the third side will be 9, eventually not following the property of triangle.}
Three scalene triangles (7, 6, 2), (7, 5, 3), (6, 5, 4)
{Reason: The maximum measure of two equal sides of the triangle can be 7 or 6 only. Taking 8 as the largest side of the triangle will leave us with the sum of other two sides as 7. Taking 5 as the largest side of triangle we end up getting an equilateral triangle which we have already considered before. 4 cannot be the largest side.}
Total number of possible triangles is 7. Ans
Note: Property of triangle used to eliminate the cases is: Sum of any two sides of a triangle is always greater than the third side.
15. **(288)** Let $A = \begin{bmatrix} x_1 & x_2 & 7 \\ y_1 & y_2 & y_3 \\ z_1 & 8 & 3 \end{bmatrix} = \begin{bmatrix} a & b & 7 \\ c & d & e \\ f & 8 & 3 \end{bmatrix}$
Let the sum of all three elements along any row, column or diagonal be S.
Then, $f = S - (8+3) = S - 11$...eqn.(i) (from the bottom row)

$d = S - (7 + f)$...eqn.(ii) (from one of the diagonals)
From equations (i) and (ii), we get
 $d = S - (7 + S - 11)$
 $\therefore d = 4$
Also, $b = S - (8 + d) = S - 12$ (from the middle column) ...eqn.(iii)
 $a = S - (b + 7)$ (from the first row) ...eqn.(iv)
From equations (iii) and (iv), we get $a = 5$ & $b = 0$
 $\therefore S = 12$
 \therefore The matrix A comes out to be = $\begin{bmatrix} 5 & 0 & 7 \\ 6 & 4 & 2 \\ 1 & 8 & 3 \end{bmatrix}$
Determinant $|A| = 5(4 \times 3 - 8 \times 2) + 0(2 \times 1 - 6 \times 3) + 7(6 \times 8 - 1 \times 4)$
 $= 5(12 - 16) + 0 + 7(48 - 4)$
 $= -20 + 0 + 308 = 288$ Ans.

QUANTITATIVE ABILITY (MCQ)

16. **(d)**



Let CD = height of the pole
BD = x

In ΔDBC , $\tan 45^\circ = \frac{h}{x} = 1$
 $\therefore h = x$

In ΔDAC , $\tan 30^\circ = \frac{h}{x+20} = \frac{1}{\sqrt{3}}$
 $\Rightarrow x + 20 = h\sqrt{3}$

Put $h = x$ in the above equation, $h + 20 = h\sqrt{3}$
 $\Rightarrow h(\sqrt{3} - 1) = 20$

$\Rightarrow h = \frac{20}{\sqrt{3}-1} \times \frac{\sqrt{3}+1}{\sqrt{3}+1} = \frac{20(\sqrt{3}+1)}{2} = 10(\sqrt{3} + 1)$ Ans.

17. **(a)** Given that $|x + 1| + (y + 2)^2 = 0$

Sum of an absolute value & a perfect square value can be equal to 0 only when each of these terms is equal to 0.

$\therefore |x + 1| = 0 \Rightarrow x = -1$

& $(y + 2)^2 = 0 \Rightarrow y + 2 = 0 \Rightarrow y = -2$

Putting the values of x and y in the equation, $ax - 3ay = 1$, we get

$a(-1) - 3a(-2) = 1$

$\Rightarrow -a + 6a = 1$

$\Rightarrow a = \frac{1}{5}$ Ans.

18. **(c)** Given $\log_4 x = a$ & $\log_{25} x = b$

Using reciprocal property of log, $\log_x 4 = \frac{1}{a}$ & $\log_x 25 = \frac{1}{b}$

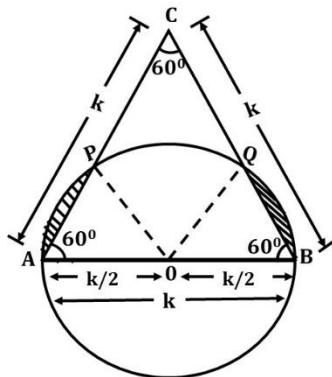
By adding the above two equations, $\log_x 4 + \log_x 25 = \frac{1}{a} + \frac{1}{b}$

$\Rightarrow \log_x (4 \times 25) = \frac{a+b}{ab} \Rightarrow \log_x 100 = \frac{a+b}{ab}$

$$\Rightarrow \log_x 10^2 = \frac{a+b}{ab} \Rightarrow 2\log_x 10 = \frac{a+b}{ab}$$

$$\Rightarrow \log_x 10 = \frac{a+b}{2ab} \text{ Ans.}$$

19. (c)



Note: ΔAOP will be an equilateral Δ because $\angle POA = \angle PAO = 60^\circ$

($\therefore AO = PO = \text{radius}$)

$$\text{Area of circle} = \pi \left(\frac{k}{2}\right)^2 = \frac{\pi \cdot k^2}{4}$$

$$\text{Area of semi-circle} = \frac{\pi}{8} k^2$$

Area of one shaded segment = area of sector AOP - area of equilateral ΔAOP

$$= \left(\frac{60^\circ}{360^\circ}\right) \pi \left(\frac{k}{2}\right)^2 - \frac{\sqrt{3}}{4} \left(\frac{k}{2}\right)^2$$

$$= \left(\frac{k}{2}\right)^2 \left[\frac{\pi}{6} - \frac{\sqrt{3}}{4}\right] = \frac{k^2}{4} \left[\frac{2\pi - 3\sqrt{3}}{12}\right]$$

$$\therefore \text{Area of 2-shaded segments} = 2 \cdot \left[\frac{k^2}{4} \left(\frac{2\pi - 3\sqrt{3}}{12}\right)\right] = \frac{k^2}{24} [2\pi - 3\sqrt{3}]$$

Area of the portion of the triangle lying inside the circle = Area of semi-circle - area of 2 shaded segments

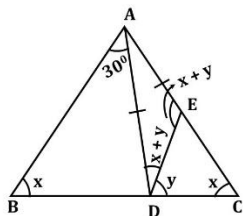
$$= \frac{k^2}{8} - \frac{k^2}{24} (2\pi - 3\sqrt{3})$$

$$= \frac{k^2}{24} [3\pi - 2\pi + 3\sqrt{3}]$$

$$= \left(\frac{k^2}{24}\right) (3\sqrt{3} + \pi)$$

Hence option (c). Ans.

20. (a)



In ΔABD , $\angle ABD = \angle ACD = x$ (let's say) ($\because AB = AC$)

Now, take $\angle CDE = y$

$\angle AED = x + y$ (Using exterior angle property)

$\therefore \angle ADE = x + y$ (ΔADE is an isosceles Δ , $AD = AE$)

$\therefore \angle DAE = 180^\circ - (2x + 2y)$

Using angle sum property, in ΔABC

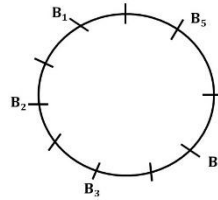
$$A + \angle B + \angle C =$$

$$\Rightarrow x + (30^\circ + 180 - 2x - 2y) + x = 180^\circ$$

$$\Rightarrow 2y = 30^\circ$$

$$\Rightarrow y = \angle CDE = 15^\circ. \text{ Ans}$$

21. (a) "At Least one boy sitting between any two girls" can be inferred as "No two girls should sit together".



First, arrange 5 boys around a circular table. This can be done in $(5 - 1)! = 4!$

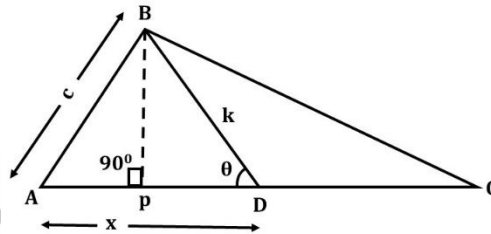
Now, there are 5 gaps available where we can make 3 girls sit in 5P_3 ways.

In this arrangement, no two girls will be sitting together.

$$\text{Total ways} = 4! \times {}^5P_3.$$

$$\text{Probability} = \frac{4! \times {}^5P_3}{7!} = \frac{4! \times 5!}{7! \times 2!} = \frac{4! \times 5!}{7 \times 6 \times 5! \times 2} = \frac{24}{7 \times 6 \times 2} = \frac{2}{7} \text{ Ans.}$$

22. (b)



Given: $BA = 'c'$

$BD = 'k'$

$\angle BDA = \theta$ (acute angle)

Now in ΔBDP , $BP = k \cdot \sin \theta$

Now in ΔABD ,

$$\cos \theta = \frac{x^2 + k^2 - c^2}{2 \cdot x \cdot k}$$

$$2xk \cdot \cos \theta = x^2 + k^2 - c^2$$

$$x^2 - 2x \cdot k \cdot \cos \theta + k^2 - c^2 = 0$$

Solving the quadratic equation for x, we get

$$x = k \cos \theta \pm \sqrt{c^2 - k^2 \sin^2 \theta}$$

$$\text{Now, the area of the } \Delta ABC = \frac{1}{2} \times 2x \times k \sin \theta$$

$$= x \cdot k \sin \theta$$

$$= \left(k \cos \theta \pm \sqrt{c^2 - k^2 \sin^2 \theta}\right) \cdot k \sin \theta$$

$$= k^2 \sin \theta \cos \theta \pm k \sin \theta \cdot \sqrt{c^2 - k^2 \sin^2 \theta}$$

$$= \frac{1}{2} k^2 2 \sin \theta \cos \theta \pm k \sin \theta \cdot \sqrt{c^2 - k^2 \sin^2 \theta}$$

$$= \frac{1}{2} k^2 2 \sin \theta \cos \theta \pm k \sin \theta \cdot \sqrt{c^2 - k^2 \sin^2 \theta}$$

$$= \frac{1}{2} k^2 \sin 2\theta \pm k \sin \theta \cdot \sqrt{c^2 - k^2 \sin^2 \theta}. \quad = \frac{1}{2} k^2 \sin 2\theta \pm$$

$$k \sin \theta \cdot \sqrt{c^2 - k^2 \sin^2 \theta}.$$

Hence option (b). Ans.

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23. (d) Given $a = \frac{(\log_7 4)(\log_7 5 - \log_7 2)}{(\log_7 25)(\log_7 8 - \log_7 4)}$
 $\Rightarrow a = \frac{2\log_7 2 \times (\log_7 5 - \log_7 2)}{2\log_7 5 \times \log_7 2}$
 $\Rightarrow a = \frac{\log_7 5 - \log_7 2}{\log_7 5}$
 $\Rightarrow a = 1 - \log_5 2$
 $\Rightarrow 1 - a = \log_5 2$
 $\Rightarrow 2 = 5^{(1-a)}$ (converting log form into exponential form)
 $\Rightarrow 2 = 5 \cdot 5^{-a} = \frac{5}{5^a}$
 $\Rightarrow 5^a = \frac{5}{2}$ Ans

24. (d) Given that
 $\left| \frac{c}{a} \right| = 4$... eqn. (1)
 $\left| \frac{a}{b} \right| = \frac{1}{3}$... eqn. (2)
 $\frac{b}{c} = \frac{-3}{4}$... eqn. (3)
 Also $ac > 0$. It means,
 (i) either both a and c are positive values, or
 (ii) both a and c are negative values.
 Let's take case-(i), a and c are +ve values.
 From equation (3), we can say c is +4x then b = -3x
 Consequently, from equation (1), a = +x (a & c should be of the same sign)

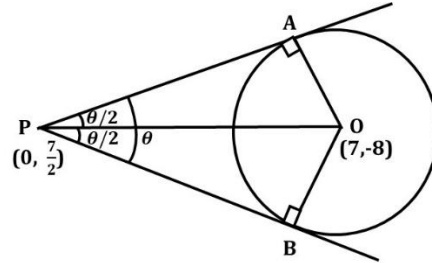
$\therefore \frac{b+c}{a} = \frac{-3x+4x}{x} = 1$
 Let's take case-(ii), a and c are -ve values
 From equation (3), we can say c is -4x then b = +3
 Consequently, from equation (1), a = -x (a & c should be of the same sign)
 $\therefore \frac{b+c}{a} = \frac{3x-4x}{-x} = 1$

In either of the cases considered above, the value of the expression is equal to 1. Ans.

25. (b) $(x^2 - 5)^4 + (x^2 - 7)^4 = 16$
 $(x^2 - 6 + 1)^4 + (x^2 - 6 - 1)^4 = 16$
 Take $x^2 - 6 = t$... (i)
 $(t + 1)^4 + (t - 1)^4 = 16$
 $(t^4 + 4t^3 + 6t^2 + 4t + 1) + (t^4 - 4t^3 + 6t^2 - 4t + 1) = 16$
 $2(t^4 + 6t^2 + 1) = 16$
 $t^4 + 6t^2 - 7 = 0$
 Let $t^4 = k^2$
 $k^2 + 6k - 7 = 0$
 $(k + 7)(k - 1) = 0$
 $k = -7, k = 1$
 $k = t^2 = -7$ (not possible, because a perfect square can't be negative)
 $\therefore t^2 = 1 \Rightarrow t = \pm 1$
 Putting $t = 1$ in the equation (i), we get
 $x^2 - 6 = 1$
 $x^2 = 7$
 $\Rightarrow x = \pm\sqrt{7}$
 Putting $t = -1$ in the equation (i), we get
 $\Rightarrow x^2 - 6 = -1$
 $\Rightarrow x^2 = 5$


$\Rightarrow x = \pm\sqrt{5}$
 Difference between maximum root ($+\sqrt{7}$) and minimum root ($-\sqrt{7}$) is
 $\sqrt{7} - (-\sqrt{7}) = 2\sqrt{7}$. Ans.

26. (b)



let $\angle APB = \theta$
 Equation of circle given is $x^2 + y^2 - 14x + 16y + 88 = 0$
 \therefore Centre coordinates $(7, -8)$
 And radius $= \sqrt{g^2 + f^2 - c} = \sqrt{(-7)^2 + (8)^2 - 88} = \sqrt{25} = 5$
 $PO = \sqrt{(7-0)^2 + (-8-\frac{7}{2})^2} = \sqrt{49 + (\frac{-23}{2})^2} = \sqrt{49 + \frac{529}{4}}$
 $= \sqrt{\frac{725}{4}}$


Applying Pythagoras theorem, in $\triangle PAO$, we get
 $PA^2 + AO^2 = PO^2$
 $PA^2 = PO^2 - AO^2$
 $PA = \sqrt{PO^2 - AO^2} = \sqrt{\frac{725}{4} - 25} = 25$
 In $\triangle PAO$, $\tan(\theta/2) = \frac{AO}{PA} = \frac{5}{(25/2)} = \frac{2}{5}$
 $\therefore \tan 2\theta = \frac{2\tan(\theta/2)}{1-\tan^2(\theta/2)} = \frac{2 \cdot (2/5)}{1 - \frac{4}{25}} = \frac{(1/5)}{(2/25)} = \frac{20}{21}$ Ans.



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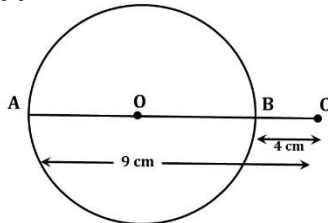


27. (b) Note: Number of digits in any number, N = (Integral part i.e. Characteristic of log N) + 1
 For number of digits of 2^{2024} ,

$\log 2^{2024} = 2024 \log 2 = 2024 \times 0.301 = 609.28$
 Number of digits in $2^{2024} = 609 + 1 = 610$
 For number of digits of 5^{2024} ,
 $\log 5^{2024} = 2024 \log 5 = 2024 \times 0.699 = 1414.71$
 Number of digits in $5^{2024} = 1414 + 1 = 1415$
 So, the total digits when $2^{2024} + 5^{2024}$ are written out consecutively is $610 + 1415 = 2025$. Ans.

28. (d) Upstream Speed = $\frac{\text{Distance travelled upstream}}{\text{Time taken}} = \frac{96}{8} = 12 \text{ km/h}$.
 Downstream speed = $\frac{\text{Distance travelled downstream}}{\text{Time taken}} = \frac{96}{6} = 16 \text{ km/h}$
 In one trip upstream and downstream, travelling for an hour each, the boat will be effectively 4 km (12km up followed by 16 down) downstream of A. So, in total 5 such trip the boat will be $4 \times 5 = 20 \text{ km}$ downstream of A. Ans.

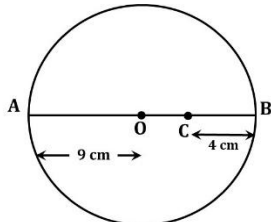
29. (a)



Case I : Point C lies anywhere outside the circle.

$AC = 9 \text{ cm}$
 $BC = 4 \text{ cm}$
 $AC = 2r + BC = 9 \text{ cm}$
 $2r + 4 = 9 \text{ cm}$
 $r = 2.5 \text{ cm}$

Case II :

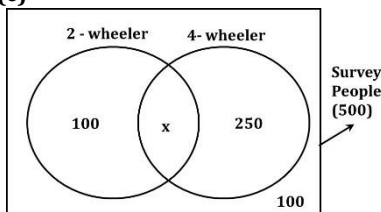


Point C lies anywhere inside the circle.

$BC = 4 \text{ cm}$
 $AC = 9 \text{ cm}$
 $2r = AC + BC = 9 + 4 = 13 \text{ cm}$
 $2r = 13 \text{ cm}$
 $r = 6.5 \text{ cm}$

So, the radius of the circle can be 2.5 cm or 6.5 cm. Ans

30. (c)



Let, $n(\text{FW})$ - Number of people who owns 4-wheelers,
 $n(\text{TW})$ - Number of people who owns 2-wheelers,
 $n(\text{FW} \cup \text{TW})$ - Number of people who owns at least one of the vehicles, and

$n(\text{FW} \cap \text{TW})$ - Number of people who owns both type of vehicles

Now, the number of people who owns at least one of the vehicles = Total people surveyed - Number of people who owns none

$(\text{FW} \cup \text{TW}) = 500 - 100 = 400$

Using the standard formula in set theory,

$n(\text{FW} \cup \text{TW}) = n(\text{FW}) + n(\text{TW}) - n(\text{FW} \cap \text{TW})$

$400 = 250 + 100 - n(\text{FW} \cap \text{TW})$

So, the number of people who owned both are $(\text{FW} \cap \text{TW}) = 50$. Ans.

31. (b) Let the series be a, ar, ar^2, \dots

Given:

$\text{Sum}_\infty = \frac{a}{1-r} = 80 \dots(i)$

Also, $a + ar = a(1+r) = 35 \dots(ii)$

$\Rightarrow 80(1-r)(1+r) = 35$

$\Rightarrow 1 - r^2 = \frac{35}{80} = \frac{7}{16}$

$\Rightarrow r^2 = \frac{9}{16}$

$\Rightarrow r = \pm \frac{3}{4}$

Substituting $r = \frac{3}{4}$ in eq.(i) we get $a = 20$. These values of a and r , won't lead the sum of series to 100 as sum of infinite terms is 80 only.

Substituting $r = -\frac{3}{4}$ in eq.(i) we get $a = 140$.

$a_1 = 140;$

$a_2 = 140 \times -\frac{3}{4} = -105;$

$a_3 = -105 \times -\frac{3}{4} = 78.75 ; a_4 = -78.75 \times -\frac{3}{4} = -59.0625;$

$a_5 = -59.0625 \times -\frac{3}{4} = 44.296875$ & so on.

Adding first 5 terms of the series, we get

$a_1 + a_2 + a_3 + a_4 + a_5 = 98.984375 \approx 100$.

So, the sum of first 5 terms of the series when $r = -\frac{3}{4}$ and $a = 140$ gives the sum close to 100.

32. (*) None of these*

Note: In year 2024, the IIM Indore authorities accepted the objection raised by student's community only for this particular question and granted 4 marks to all the test takers. They acknowledged that the question is alright but all the option given were incorrect. Though they did not share the correct answer for this question.

Don't worry, SG has solved it for you.

Sol. Let us give one balloon to each one of them. So, we are now left with 12 balloons to be distributed.

CASE I:

$G_1 G_2 G_3 G_4 G_5 \quad B_1 B_1 B_1$

Giving no balloons to any boy and distributing remaining 12 balloons to the 5 girls.

Total ways = ${}^{12+5-1}C_{5-1} = {}^{16}C_4 = 1820$ ways.

[By using the formula ${}^{n+r-1}C_{r-1}$]

CASE II:

Giving 1 balloon to one of the boys, which can be done in 3 ways

And distributing remaining 11 balloons to the 5 girls, such that each girl should get at least one balloon.

This can be done in ${}^{10}C_4 =$ ways.

\therefore Total ways $3 \times {}^{10}C_4 = 3 \times 210 = 630$ ways.

CASE III:

Giving 1 balloon each to 2 boys, which again can be done in 3 ways.

And distributing remaining 10 balloons to the 5 girls, such that each girl should get at least one balloon.

This can be done in 9C_4 ways.

\therefore Total ways $3 \times {}^9C_4 = 3 \times 126 = 378$ ways.

CASE IV:

Given 1 balloon to each of the 3 boys and distributing remaining 9 balloons to the 5 girls such that each girl should get at least one balloon.

\therefore Total way $= 1 \times {}^8C_4 = 70$ way

CASE V:

Giving 2 balloon to exactly one boy which can be done in 3 ways and distributing remains 10 balloons to the 5 girls such that each get at least 2 balloons which can be done in only 1 way.

\therefore Total ways $= 3 \times 1 = 3$ ways

Adding all the possible ways obtained in all the 5 cases, we get

$1820 + 630 + 378 + 70 + 3 = 2901$ ways. Ans.

33. (a) Option (a) $3^{200} = (3^2)^{100} = 9^{100}$

Option (c) 4^{100}

Option (d) $2^{300} = (2^3)^{100} = 8^{100}$

Clearly, among the option (a), (c) and (d) the exponent is same. So, the option with largest base will be largest.

So, among these three options, option (a) is largest.

Now option(b) is $2^{100} + 3^{100} < 3^{100} + 3^{100}$

Or, $2^{100} + 3^{100} < 2 \times 3^{100}$

And, 2×3^{100} is certainly less than 3^{200} i.e. option (a)

That means, option (b) is less than option (a).

\therefore Option(a) is the highest.

34. (a) The given expression can also be written as ${}^{17-x}C_{3x+1}$.

at $x = 0$, we get ${}^{17}C_1$ (an integer)

at $x = 1$, we get ${}^{16}C_4$ (an integer)

at $x = 2$, we get ${}^{15}C_7$ (an integer)

at $x = 3$, we get ${}^{14}C_{10}$ (an integer)

at $x = 4$, we get ${}^{13}C_{13}$ (an integer)

at $x = 5$, we get ${}^{12}C_{16}$ (the expression is not defined)

After putting $x = 5$ or more, the expression will not be defined.

So, x can take only 5 values i.e. 0, 1, 2, 3, 4. Ans.

35. (a) Given $x_1 + x_2 + x_3 + x_4 = 50$... (i)
and $x_1 \geq 1$ or $x_1 - 1 \geq 0$ | $x_2 \geq 2$ or $x_2 - 2 \geq 0$ | $x_3 \geq 0$ | $x_4 \geq 0$

Let $x_1 - 1 = a$ | $x_2 - 2 = b$ | $x_3 = c$ | $x_4 = d$

So, now we have **a, b, c, d ≥ 0**

Equation (i) can be written as $(a+1) + (b+2) + c + d = 50$

or, $a + b + c + d = 47$

We have to find non-negative integer solution of above equation.

It can be found using the formula ${}^{n+r-1}C_{r-1}$ where, $n = 47$ & $r = 4$

\therefore Total number of solutions $= {}^{47+4-1}C_{4-1} = {}^{50}C_3 = \frac{50 \times 49 \times 48}{3 \times 2 \times 1} = 19600$ Ans.

36. (b) Let the amount invested in scheme B @12% S.I. per annum be x and amount invested in scheme A @10% C.I. per annum, compounded half-yearly be $(10000-x)$.

$$x \left(1 + \frac{12}{100}\right) - (10000 - x) \left(1 + \frac{5}{100}\right)^2 = 2310$$

$$\Rightarrow \frac{112x}{100} - 10000 \times \left(\frac{21}{10}\right)^2 + \frac{441x}{400} = 2310$$

$$\Rightarrow \frac{889x}{400} - 10000 \times \frac{441}{400} = 2310$$

$$\Rightarrow \frac{889x}{400} = 2310 + 11025 = 13335$$

$$\Rightarrow x = \frac{13335 \times 400}{889} = 6000 \text{ rupees}$$

Total simple interest earned from scheme B $= 6000 \times \frac{12}{100} = 720$ rupees

Total compound interest earned from scheme A $= 4000 \times \left(\frac{21}{20}\right)^2 - 4000$

$$\Rightarrow 4000 \left(\frac{441}{400} - 1\right) \Rightarrow 4000 \times \frac{41}{400} = 410 \text{ rupees}$$

\therefore Total interest earned $= 720 + 410 = 1130$ rupees. Ans

37. (c) Let the number of apples and oranges be x and y .

Then the number of bananas $= x + 10$.

Total number of fruits $= 2x + y + 10$

As per the question, $x + (x + 10) = 11k$ (where k is a multiple of 11)

$$\Rightarrow 2x + 10 = 11k \Rightarrow k = \frac{2x+10}{11} \dots (i)$$

Also, total fruits sold by the seller can be expressed in two ways. Equating both the expressions, we get

$$\frac{7x}{10} + \frac{6}{10}(x + 10) + \frac{5}{10}y = \frac{55}{100}(2x + y + 10)$$

$$\Rightarrow 14x + 12x + 120 + 10y = 22x + 11y + 110$$

$$\Rightarrow 4x + 10 = y \dots (ii)$$

Now, it is given that the fruit seller sold 70% of apples i.e. $\frac{7x}{10}$.

In order to keep this number an integer, x must be a multiple of 10.

The smallest value of x in eqn.(i), for which $k = \frac{2x+10}{11}$ will be an integer is 50, a multiple of 10.

Substituting, $x = 50$ in eqn.(ii), we get

$$y = 4(50) + 10 = 210 \text{ oranges. Ans}$$

38. (d) We know n^{th} term of a G.P. is given by the formula,

$$a_n = ar^{n-1}$$

Using above formula, we can say,

$$p^{\text{th}} \text{ term} = ar^{p-1} = q \dots (1)$$

$$q^{\text{th}} \text{ term} = ar^{q-1} = p \dots (2)$$

where, a is the first term and r is the common ratio of the G.P.

Dividing equation (2) by equation (1), we get

$$\frac{p}{q} = \frac{r^{q-1}}{r^{p-1}}$$

$$\frac{p}{q} = r^{q-p}$$

Taking log both sides, we get $\log\left(\frac{p}{q}\right) = (q - p) \log r \dots (3)$

Taking log on both sides, of equation (2), we get
 $\log p = \log a + \log r^{q-1}$
 $\log p = \log a + (q - 1) \log r$
 $\log a = \log p - (q - 1) \log r \dots(4)$
 Substituting the value of 'log r' from eqn.(3) in eqn.(4), we get

$$\log a = \log p - (q - 1) \cdot \log \left(\frac{p}{q} \right) \cdot \frac{1}{(q-p)}$$

$$\log a = \log p + \frac{(q-1)(\log p - \log q)}{(p-q)}$$

$$\log a = (p - q) \log p + (q - 1) \log p - (q - 1) \log q$$

$$\log a = \frac{(p-1)\log p + (1-q)\log q}{p-q}$$

or, $\log a = \frac{(1-q)\log q - (1-p)\log p}{p-q}$ Option (d) Ans.

39. (c) $x^2 - 10|x| - 56 = 0$
 We know, if $x \geq 0$, then $|x| = +x$
 $\Rightarrow x^2 - 10x - 56 = 0$
 $\Rightarrow (x - 14)(x + 4) = 0$
 $\Rightarrow x = 14$ or -4 (only one root, +14 is valid)
 Also, if $x < 0$, then $|x| = -x$
 $\Rightarrow x^2 - 10(-x) - 56 = 0$
 $\Rightarrow x^2 + 10x - 56 = 0$
 $\Rightarrow (x + 14)(x - 4) = 0$
 $\Rightarrow x = -14$ or $+4$ (only one root, -14 is valid)
 So, only 2 real solutions. Ans

40. (c) Let the number of girls be G and total number of students be N.
 Given that, $40\% N < G < 50\%$
 $\Rightarrow \frac{12}{25}N < G < \frac{1}{2}N$
 Multiplying throughout by 50, we get
 $24N < 50G < 25N$
 Here $50G$ is a number which is multiple of 50.
 Now checking with the options:
Option (a), 25 (starting with the smallest of all the given options)
 $24 \times N = 24 \times 25 = 600$
 And, $25 \times N = 25 \times 25 = 625$
 So, there is no multiple of 50 in this range.
Option (c), 27 (the second smallest value in the given options)
 $24 \times N = 24 \times 27 = 648$
 And, $25 \times N = 25 \times 27 = 675$
 So, there lies a multiple of 50 in this range i.e. 650.
 So, option (c) satisfies. Ans.
Verification:
 $50G = 650$
 $G = 13 \quad N = 27$
 $\frac{13}{27} \times 100 = 48.14\%$ which lies between 48% and 50%.

Hint: [Q.41-Q.45] Common Solution

	A	B	C	Total
S ₁	win 19	loose 1	loose 0	20
S ₂	loose 7	loose 5	win 8	20
S ₃	loose 6	loose 6	win 8	20
S ₄	loose 9	win 11	loose 0	20
S ₅	loose 8	win 12	loose 0	20

Total	49	35	16	100
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From point (2), we can conclude that C must have 8 votes each in S₃ and S₄, that so as up to 16. It also means C did not get any votes in S₁, S₂ and S₅. It also implied that B must have win S₄ and S₅ constituencies as 'A' has won only in S₁. Now in S₃ and S₄, possible combination of votes A and B can be (5, 7), (7, 5) or (6, 6) in that order respectively.

By doing hit and trial, we can come to a conclusion that B must have win 11 and 12 votes in S₄ and S₅ respectively.

And also, it must have received 1, 5 and 6 votes in S₁, S₂ and S₂ constituency from point (3).

From the completed table we can see, B got lower number of votes compared to A and C only in S₂. Ans.

41. (d)
 42. (d)
 43. (d)
 44. (d)
 45. (c)

VERBAL ABILITY & READING COMPREHENSION

46. (b) **a) The government:** This option refers to executive branches and administrative bodies that implement and enforce laws and policies. While the government is involved in air quality management, the passage specifically highlights judicial pronouncements rather than governmental declarations.

(b) The courts: This option is correct. The passage explicitly mentions that many judicial pronouncements have upheld the "right to clean air" as a corollary to the fundamental right to life, indicating that the courts have endorsed this right.

(c) The media: This option refers to news outlets, journalists, and other information dissemination platforms. Although the media can raise awareness about air pollution and advocate for clean air, the passage does not indicate that the media has a formal role in endorsing the right to clean air.

(d) Parliament: This option refers to the legislative branch responsible for making laws. While Parliament can pass legislation related to air quality, the passage does not mention any legislative endorsement of the right to clean air; instead, it focuses on judicial endorsements.

47. (d) **a) projecting a bleak future for India:** This option suggests that the author is indicating a hopeless and grim future for India due to air pollution. However, the passage is not focused on predicting a bleak future; rather, it emphasizes the need for action and cooperation to improve air quality. Therefore, this option is incorrect.

(b) being melodramatic: This option implies that the author is being overly emotional or exaggerated in discussing the issue. The tone of the passage, while urgent, is factual and reasoned. It presents the situation seriously and calls for practical solutions rather than using excessive emotion. Hence, this option is not accurate.

(c) being ambivalent: This option means the author is showing uncertainty or mixed feelings about the issue.

However, the passage clearly communicates a strong and consistent message about the importance of addressing air pollution and does not reflect any uncertainty. Therefore, this option is incorrect.

(d) emphasizing the need to fight for clean air: This option correctly interprets the last sentence as a call to action, highlighting the importance of combating air pollution. The passage stresses the necessity of collective effort to improve air quality, making this the correct answer.

48. **(d) (a) The problem of air pollution is limited to the major cities in India:**

This is incorrect because the passage mentions that even lower-tier cities and towns in India are suffering from very poor air quality, indicating that air pollution is not limited to major cities.

(b) The 50 most polluted cities in the world are in India:

This is incorrect. The passage states that 42 Indian cities/towns are among the 50 most polluted globally, not all 50.

(c) Delhi's air quality is the poorest in the entire world:

This is incorrect. The passage states that New Delhi is the world's most polluted capital and that the larger Union Territory of Delhi is the third most polluted region globally, but it does not claim that Delhi's air quality is the poorest in the entire world.

(d) Industrialization makes Begusarai the most polluted city in the world:

This is the correct statement. The passage notes that Begusarai, which is partly industrialized and houses an oil refinery, is the world's most polluted city, indicating that industrial activities contribute significantly to its pollution levels.

49. **(b) (a) To create confusion:** This option is unlikely because the writer's presentation is straightforward and clear. The passage provides specific information about air pollution levels in New Delhi and other Indian cities, backed by data from IQAir. There is no indication that the writer aims to mislead or confuse the reader.

(b) To be critical: This option best describes the writer's intention. The passage critically examines the issue of air pollution in India, using specific data to highlight the severity of the problem. The writer points out the failure of existing measures, like the introduction of CNG and the Graded Response Action Plan, to significantly improve air quality. By suggesting that governments must rely on science, promote behavioral changes, and treat clean air as a common public good, the writer's intention is to critique current efforts and advocate for more effective solutions.

(c) To be negative: While the information about air pollution is indeed negative, the writer's overall approach is not solely to highlight the negativity. Instead, the writer focuses on presenting the seriousness of the situation and the inadequacy of current measures. The passage also offers constructive solutions, indicating that the intention is not merely to be negative but to drive awareness and change.

(d) To be judgmental: The writer does not express personal opinions or moral judgments. The tone remains factual and analytical, with a focus on data and the need for systematic changes. By emphasizing the importance of seeing clean air as a public good and the need for coordinated efforts, the writer avoids a judgmental stance and instead promotes a collective responsibility.

50. **(b) a) Governments at all levels should be involved in tackling the problem of air pollution:**

This point is explicitly mentioned in the passage. It emphasizes the involvement of governments at various levels, including central, state, and municipal, in addressing air pollution. Therefore, this option is consistent with the writer's points and is not eliminated.

(b) Clean air is the right of every consumer:

This point is not explicitly made in the passage. While the passage discusses the right to clean air as upheld by judicial pronouncements, it does not specifically refer to clean air as the right of every consumer. Hence, this option is eliminated.

(c) Scientific methods are needed to address the problem of air pollution:

This point is clearly articulated in the passage. It emphasizes the importance of using scientific methods to understand, measure, and monitor air pollution, indicating the necessity of scientific approaches in addressing the problem. Therefore, this option is consistent with the writer's points and is not eliminated.

(d) Polluting behavior should be punished:

This point is implicit in the passage. While the passage mentions the use of penalties to achieve behavioral changes in addressing air pollution, it does not explicitly state that polluting behavior should be punished. However, the use of penalties implies consequences for such behavior.

Therefore, this option is consistent with the writer's points and is not eliminated.

51. **(d) (a) gets rejected:**

This option misinterprets the meaning of "kicks in." The phrase implies the activation or implementation of a plan, not its rejection or dismissal.

(b) gains importance:

This option inaccurately represents the meaning of "kicks in." The phrase suggests the commencement or initiation of something, rather than its increase in significance.

(c) causes violence.

This option is irrelevant to the meaning of "kicks in." The phrase indicates the initiation or enforcement of a plan, not the instigation of violence.

(d) comes into force.

This option accurately reflects the meaning of "kicks in." It signifies the activation or implementation of the Graded Response Action Plan when certain conditions are met.

52. **(c) (a) Despite being inherited from our evolutionary past, anxiety frequently undermines survival as it is not an integral part of human nature.**

This option is incorrect because the passage emphasizes that anxiety has a survival function and is an integral part of human nature. Anxiety is described as something we have inherited for good reasons, as it helps us respond to danger effectively.

(b) Anxiety is part of our evolutionary past, yet has limited relevance now as it does not significantly impact our chances of survival.

This option is incorrect because the passage indicates that anxiety still plays a crucial role in our survival by helping us respond to real dangers and manage tasks that require focus and quick reactions.

(c) Anxiety is ingrained within us due to our evolutionary heritage and generally serves to promote survival.

This option accurately reflects the passage's content, stating that anxiety has been built into us through evolution and serves a survival function, such as helping us respond to danger and stay focused on important tasks.

(d) Anxiety, an intrinsic part of human nature, often disrupts our ability to thrive by acting as an impediment to survival.

This option is incorrect because it suggests that anxiety is more of an impediment than a survival mechanism. The passage acknowledges that anxiety can become problematic but primarily highlights its beneficial and adaptive purposes.

53. **(d) (a) Physical activity serves as a temporary distraction from anxiety, but its long-term effects remain unclear.**

This option is incorrect because the passage provides evidence that exercise has more than just a temporary effect on anxiety. It mentions the production of endorphins and improved sleep quality as long-term benefits that can alleviate anxiety symptoms.

(b) Exercise-induced endorphins facilitate cognitive behavioural therapy's effectiveness.

This option is incorrect because the passage does not discuss a direct connection between exercise-induced endorphins and the effectiveness of cognitive behavioural therapy (CBT). While exercise and CBT are both mentioned as treatments for anxiety, their relationship is not described in this way.

(c) Exercise may directly target the amygdala to reduce anxiety symptoms.

This option is incorrect because the passage does not suggest that exercise directly affects the amygdala. The role of the amygdala in anxiety disorders is discussed separately from the benefits of exercise, which are attributed to the production of endorphins and improved sleep.

(d) Physical activity could enhance sleep quality, indirectly lessening anxiety symptoms.

This option is correct because the passage explicitly mentions that exercise can help people fall asleep faster and have deeper, more relaxing sleep. This improvement in sleep quality is beneficial for individuals with anxiety, as it can change their perspectives and reduce anxiety symptoms.

54. **(d) (a) By comparing different types of anxiety disorders.**

This option is incorrect because the passage does not compare or contrast different types of anxiety disorders. Instead, it focuses on the general concept of anxiety and discusses its beneficial aspects as well as when it becomes problematic. The passage emphasizes treatments for anxiety rather than detailing or comparing various forms of the disorder.

(b) By presenting contrasting viewpoints on the subject.

This option is incorrect because the passage does not present contrasting viewpoints. It provides a cohesive and unified explanation of the nature of anxiety, its evolutionary purpose, and various treatment methods. There is no discussion of differing opinions or debates on the topic within the text.

(c) By outlining the historical development of anxiety treatments.

This option is incorrect because the passage does not trace the history of anxiety treatments. While it mentions that exposure therapy was the first psychotherapy treatment shown to be effective, it does not provide a chronological development of treatments over time. The focus is more on explaining current treatment methods and their effectiveness rather than providing a historical perspective.

(d) By discussing various treatment options and their effectiveness.

This option is correct because the passage systematically presents different treatment options for anxiety and discusses their effectiveness. It mentions exposure therapy, cognitive behaviour therapy, medication, and exercise, describing how each method can help manage and reduce

anxiety symptoms. This organizational structure aligns with presenting multiple solutions and evaluating their benefits.

55. **(b) (a) It is always indicative of an imagined danger rather than a real one.**

This option is incorrect because the passage mentions that anxiety can be problematic if the danger is imagined or exaggerated, but it does not state that it is always indicative of an imagined danger. Anxiety disorders can also arise from real dangers that are perceived as more severe than they actually are.

- (b) It is characterized by a persistent and exaggerated perception of danger.**

This option is correct because the passage states that anxiety becomes problematic "if the perceived danger is out of proportion to the real danger, and it is persistent and disabling." This description aligns with the idea of a persistent and exaggerated perception of danger.

- (c) It occurs when the perceived danger is proportionate to the real danger.**

This option is incorrect because the passage indicates that anxiety is problematic when the perceived danger is out of proportion to the real danger, not when it is proportionate.

- (d) It primarily arises from genetic factors rather than environmental influences.**

This option is incorrect because the passage discusses both genetic and environmental factors, such as pollution, physical and psychological stress, and diet, as contributing to anxiety disorders. It does not state that anxiety disorders primarily arise from genetic factors.

56. **(d) (a) investigating the physiological benefits of exercise on anxiety management.**

This option is incorrect because, while the passage does mention the benefits of exercise in managing anxiety, it is only one part of the broader discussion. The passage addresses various aspects of anxiety, including its evolutionary purpose and different treatments, not just the physiological benefits of exercise.

- (b) evaluating the effectiveness of psychotherapy and medication in treating anxiety.**

This option is incorrect because the passage does discuss psychotherapy and medication, but it is not limited to evaluating their effectiveness. The passage also covers the nature of anxiety, its evolutionary role, and other treatment options like exercise.

- (c) understanding the complex interplay between genetic and environmental factors in anxiety disorders.**

This option is incorrect because, although the passage mentions genetic and environmental factors as contributors to anxiety disorders, it does not focus solely on this interplay. The primary concern of the passage is broader, encompassing the nature of anxiety, its adaptive functions, and various treatments.

- (d) exploring the multifaceted nature of anxiety and its adaptive functions.**

This option is correct because the passage is primarily about understanding the different aspects of anxiety, including its role in survival, its adaptive purposes, and when it can become problematic. It also covers various treatments, indicating a comprehensive exploration of anxiety's multifaceted nature

57. **(b) (a) Regular exercise does little to alleviate anxiety symptoms and improve sleep quality.**

This statement suggests that regular exercise has minimal impact on alleviating anxiety symptoms and improving sleep quality. However, the passage contradicts this assertion. It explicitly mentions that exercise can help with anxiety problems by producing endorphins, which act as natural painkillers. Furthermore, exercise can improve sleep quality by helping individuals fall asleep faster and have deeper, more relaxing sleep. Therefore, the passage indicates that regular exercise indeed has significant benefits for managing anxiety symptoms and improving sleep quality, making option (a) incorrect.

- (b) Exposure therapy encourages individuals to face their feared situations gradually.**

This statement aligns with the information presented in the passage. The passage discusses exposure therapy as a treatment method that involves gradually exposing individuals to their feared situations. It explains that exposure therapy encourages people "in a graded way to go into their feared situations and stay in them for as long as they can and build their confidence that way." Therefore, option (b) accurately reflects the approach of exposure therapy described in the passage.

- (c) Cognitive behaviour therapy is the most preferred treatment for anxiety disorders.**

This statement suggests that cognitive behaviour therapy (CBT) is the preferred treatment option for anxiety disorders. However, the passage does not explicitly state that CBT is the most preferred treatment or indicate a hierarchy of preference among treatment options. While it acknowledges CBT as an effective treatment, it does not claim that it is preferred over other options such as exposure therapy or medication. Therefore, option (c) goes beyond what is supported by the passage.

- (d) Medication is the first-line therapy and primary cure for anxiety disorders.**

This statement implies that medication is the primary and preferred treatment for anxiety disorders. However, the passage does not support this assertion. While medication is mentioned as one of the treatment options for anxiety disorders, the passage emphasizes that medication alone cannot cure an anxiety disorder. It states that medication can help keep anxiety under control while individuals receive psychotherapy, indicating that medication is typically used in conjunction with other treatments rather than as a standalone cure. Therefore, option (d) is not supported by the passage.



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58. **(c) (a) ate my head**

This option is not a common English expression and does not accurately convey the idea of someone responding angrily or harshly. It is not idiomatic or appropriate in this context.

(b) cut my voice

This option does not make sense in the context of someone reacting angrily to a request. "Cut my voice" is not a recognized phrase in English, and it does not convey the idea of someone responding abruptly or harshly.

(c) bit my head off

This option accurately captures the intended meaning. "Bit my head off" is a common idiomatic expression in English, used to describe someone responding angrily, sharply, or rudely to a question or request.

(d) hit my ear off

This option does not make sense in the context provided. "Hit my ear off" is not a recognized phrase in English and does not convey the idea of someone responding angrily or sharply. It is not an appropriate option in this context.

59. **(c) (a) comes with**

This option doesn't quite fit here. "Comes with" suggests something that naturally accompanies or is included with something else, but it doesn't quite capture the idea that the success of the show is dependent on teamwork and collaboration.

(b) come along with

This option also doesn't quite work in this context. "Come along with" implies something that accompanies or follows something else, but it doesn't convey the idea that teamwork and collaboration are essential for the success of the show.

(c) comes down to

This option seems to be the best fit. "Comes down to" means that something is ultimately dependent on something else. In this case, the success of the show is ultimately dependent on fostering teamwork and collaboration among the performers.

(d) comes about

This option doesn't fit here. "Comes about" typically means that something happens or occurs, but it doesn't convey the

idea that the success of the show is directly dependent on teamwork and collaboration.

60. **(b) (a) beneath the weather**

This option doesn't quite fit here. "Beneath the weather" doesn't seem to be a common expression, and it doesn't accurately convey the idea of someone feeling unwell or sick.

(b) under the weather

This option seems to be the best fit. "Under the weather" is a common expression used to describe someone who is feeling unwell or sick, which fits the context of Anil not being able to attend the party due to his fever.

(c) outside the weather

This option doesn't make sense in this context. "Outside the weather" isn't a phrase commonly used in English, and it doesn't accurately convey the idea of someone feeling unwell or sick.

(d) beside the weather

This option doesn't fit here. "Beside the weather" doesn't seem to be a common expression, and it doesn't accurately convey the idea of someone feeling unwell or sick.

61. **(b) (a) rule the roost**

This option doesn't quite fit here. "Rule the roost" means to be in charge or control of a situation, but it doesn't convey the idea of acting in accordance with one's words or beliefs, which is what the Principal seems to be advising the candidates to do.

(b) walk the talk

This option seems to be the best fit. "Walk the talk" means to act in accordance with one's words or beliefs, which aligns with the Principal's advice to the candidates to take action on issues like gender bias and inclusivity if they want to be taken seriously.

(c) read the lines

This option doesn't make sense in this context. "Read the lines" usually refers to following a script or instructions, but it doesn't convey the idea of acting in accordance with one's words or beliefs, as the Principal seems to be advising the candidates to do.

(d) go around the bend

This option doesn't fit here. "Go around the bend" means to become mentally unstable or irrational, but it doesn't convey the idea of acting in accordance with one's words or beliefs, which is what the Principal seems to be advising the candidates to do.

62. **(c) (a) dropped out**

This option doesn't quite fit here. "Dropped out" usually refers to someone withdrawing from an activity or a commitment, but it doesn't accurately convey the idea that the picnic plans were cancelled due to the rain.

(b) dropped off

This option doesn't make sense in this context. "Dropped off" typically means to decrease in number or intensity, but it doesn't convey the idea that the picnic plans were cancelled or unsuccessful.

(c) fell through

This option seems to be the best fit. "Fell through" means that something did not happen or was not successful as planned, which accurately describes the situation where the picnic plans were disrupted or cancelled due to the heavy rain.

(d) fell behind

This option doesn't quite fit here. "Fell behind" usually means to fail to keep up with something or someone, but it doesn't convey the idea that the picnic plans were cancelled or unsuccessful due to the rain.

63. **(d) (a) brought up**

This option doesn't seem to fit here. "Brought up" typically means to raise a topic or issue for discussion, but it doesn't convey the idea of causing or initiating positive changes in the workplace.

(b) brought on

This option doesn't quite fit in this context. "Brought on" usually means to cause something to happen, often negative or undesirable, but it doesn't convey the idea of causing positive changes in the workplace.

(c) brought along

This option doesn't make sense here. "Brought along" typically means to bring someone or something with you, but it doesn't convey the idea of causing or initiating positive changes in the workplace.

(d) brought about

This option seems to be the best fit. "Brought about" means to cause or initiate something, especially a change or an event, which accurately describes the situation where the new regulations led to positive changes in the workplace.

64. **(b) (a) puts her off**

This option doesn't quite fit. "Puts her off" usually means to discourage or distract someone, like saying or doing something that makes them lose interest. But it doesn't really match the idea of Manohar tolerating Sheila's interruptions.

(b) puts up with her

This option works well. "Puts up with her" means to tolerate or endure someone's behavior, even if it's annoying or

unpleasant. This fits the situation where Manohar tolerates Sheila's interruptions because she's his younger sister.

(c) puts along with her

This one doesn't make sense here. "Puts along with her" isn't really a common phrase, and it doesn't really convey the idea of tolerating Sheila's interruptions.

(d) puts her on

This one doesn't quite fit either. "Puts her on" usually means to deceive or trick someone, but that doesn't really match the idea of Manohar tolerating Sheila's interruptions because she's his younger sister.

65. **(c) (a) was losing his keys**

This option doesn't fit because the sentence is describing a habitual action, indicated by "all the time," which requires the present tense. "Was losing" is in the past continuous tense, which doesn't match the ongoing nature of the action described.

(b) is loosing his keys

This option doesn't work because "loosing" is the incorrect form of the verb. "Loosing" is often confused with "losing," but "losing" is the correct form to indicate misplacing something. "Is losing" would be the correct form for present tense, but it's not provided here.

(c) loses his keys

This option seems to be the best fit. "Loses" is the correct form of the verb to indicate a habitual action in the present tense, which matches the rest of the sentence. It accurately conveys the idea that the person frequently misplaces their keys.

(d) has loses his keys

This option is incorrect because "has loses" is grammatically incorrect. The verb form "loses" should be used after "has" to form the present perfect tense, but "loses" is already correct in the present simple tense. Additionally, the use of "has" in the present perfect tense is unnecessary and doesn't convey the intended meaning of habitual action.

66. **(b) (a) was having a headache**

This option doesn't work because "was having a headache" is in the past continuous tense, which doesn't match the tense of the rest of the sentence. The sentence begins in the past perfect continuous tense ("I had been having a headache"), but then abruptly switches to the simple future tense ("I will not attend the meeting"). Therefore, this option doesn't provide the necessary consistency in verb tense.

(b) have a headache

This option provides the correct verb tense and structure to maintain grammatical consistency with the rest of the sentence. The phrase "have a headache" is in the present tense, which matches the present perfect continuous tense of the first part of the sentence ("I had been having a headache"). "Have a headache" accurately conveys the idea that the speaker currently has a headache, which aligns with the context of the sentence indicating a present condition affecting the speaker's ability to attend the

meeting. This option is grammatically correct and idiomatic, making it the most suitable alternative to complete the sentence accurately.

(c) used to have a headache

This option doesn't fit the context of the sentence. "Used to have a headache" typically implies a past habitual action, but it doesn't convey the idea that the speaker currently has a headache. It suggests that the speaker no longer experiences headaches, which contradicts the context of the sentence.

(d) have headache

This option is incorrect because "have headache" is not a grammatically correct phrase. In English, "headache" is typically used as a countable noun, so it requires an article ("a" or "the") or a possessive pronoun ("my," "your," etc.) before it. Therefore, "have a headache" or "have had a headache" would be correct, but "have headache" is not.

67. **(a) (a) Board's hopes to continuing talks on a future deal seem**

This option correctly maintains subject-verb agreement, with "hopes" (plural) matching "seem" (plural). The phrase "Board's hopes to continue talks on a future deal" indicates the intention or desire of the Boards to engage in ongoing discussions about a future deal. The verb "seem" agrees with the plural subject "hopes," indicating that the speaker finds the likelihood of the negotiations continuing increasingly improbable. The phrase "seem to be increasingly improbable" effectively conveys the speaker's assessment of the situation.

(b) Boards' hopes to continued talks on a future deal seems

This option has a subject-verb agreement error. "Hopes" (plural) does not agree with "seems" (singular). Additionally, "continued" is the past tense form of the verb, which is incorrect in this context.

(c) Boards' hopes on continued talks on a future deal seem

This option also has a subject-verb agreement error. "Hopes" (plural) does not agree with "seem" (singular). Additionally, the phrase "hopes on continued talks" is unclear.

(d) Board's hopes to continuing talks on a future deal seems

This option is incorrect as it contains a subject-verb agreement error. "Hopes" (plural) does not agree with "seems" (singular). "Hopes" should be followed by a plural verb i.e. "seem".

68. **(c) (a) are having more lasting impact than those of other filmmakers**

This option uses the present continuous tense "are having," which suggests ongoing action. However, the sentence is discussing the lasting impact of Hitchcock's films, which is better conveyed with a past or present perfect tense. Additionally, "those of other filmmakers" is slightly awkward; it could be clearer.

(b) has had a more lasting impact than those of other filmmakers

This option uses the present perfect tense "has had," which indicates a completed action with ongoing relevance. However, "has" is used incorrectly as the subject is "psychological thrillers" which is plural and "has" is singular. While this tense is appropriate for discussing the impact of Hitchcock's films, "those of other filmmakers" is somewhat vague and could be clearer.

(c) have had a more lasting impact than those of any other filmmaker

This option correctly uses the present perfect tense "have had," which indicates completed action with ongoing relevance. It also specifies "those of any other filmmaker," making the comparison clear and precise. This option maintains tense consistency and effectively conveys the intended meaning.

(d) had more lasting impact than any filmmaker

This option uses the past tense "had," which suggests that the impact was in the past and may not continue into the present. However, the sentence is discussing the lasting impact, which is ongoing. Additionally, "any filmmaker" is overly broad and does not specify the comparison group as clearly as option (c).

69. **(c) (a) provides a welcome retreat for them seeking solace**

This option has a pronoun error. "Them" is used as an object pronoun, but it should be a subject pronoun to refer to the individuals seeking solace. Additionally, the entire sentence is written in past tense whereas this option is written in present tense, which makes it incorrect.

(b) provides a welcoming retreat for those seeking solace

This option correctly uses the appropriate pronoun "those" to refer to the individuals seeking solace. However, it should be written in past tense to continue the tense in the entire sentence. Hence, this is incorrect.

(c) provided a welcome retreat for those seeking solace

This option changes the verb tense to past tense ("provided") which is consistent with the rest of the sentence, which is in the past tense. Additionally, it mentions the pronoun "those" to refer to those people who look for solace. Hence, this is correct.

(d) provided a welcoming retreat for who seek solace

This option has a relative pronoun error. "Who" should be changed to "those" to refer to the individuals seeking solace. Hence, this is wrong.

70. **(b) The paragraph discusses the prevalent use of artificial intelligence (AI) in various fields like healthcare, finance, and transportation, primarily relying on deep learning and natural language processing. However, there's ongoing debate regarding AI's capacity for creativity comparable to humans. The completion suggests that AI-generated works may lack the depth, emotional connection, and unique perspectives inherent in human experiences. This highlights a critical distinction between AI's mimicry of**

patterns and the genuine creativity rooted in human emotions and experiences.

(a) Man has long feared the rise of the machine, his own creation becoming smarter and more intelligent than him

This option introduces a different topic related to the fear of machines surpassing human intelligence. While this topic is relevant to discussions about AI, it doesn't directly address the debate about AI's ability to possess creativity. Therefore, it's not the most suitable completion for the paragraph.

(b) AI-generated works may lack the depth, emotional connection, and unique perspectives that come with human experiences and emotions

This is the most suitable completion as it directly addresses the debate about AI's creativity compared to humans. It highlights that AI-generated works may lack depth, emotional connection, and unique perspectives found in human experiences. This contrasts AI's ability to mimic patterns with the depth of human creativity rooted in emotions and experiences, which is crucial for understanding the ongoing debate about AI's capabilities.

(c) AI usage raises a number of ethical concerns such as privacy issues, bias in algorithms, and the potential misuse of AI in many applications

This option shifts the focus to ethical concerns related to AI usage, such as privacy issues and bias in algorithms. While important, this topic is not directly related to the debate about AI's creativity. Therefore, it doesn't provide the most appropriate completion for the paragraph.

(d) High-performance computing has already proven a machine's ability to perform advanced calculations far faster and more accurately than the human mind

This option introduces a different aspect of AI's capabilities, specifically its ability to perform advanced calculations. While relevant to discussions about AI, it doesn't directly address the debate about AI's creativity. Therefore, it's not the most suitable completion for the paragraph.

71. **(c) (a) He successfully integrates traditional Japanese aesthetics and modern design principles in his work.**

This option highlights Yamamoto's architectural style, emphasizing his ability to blend traditional Japanese aesthetics with modern design principles. While this information could be relevant to understanding Yamamoto's work, it does not directly address his impact on blurring the boundary between public and private spaces, which is the main focus of the paragraph.

(b) He was recently named the 2024 Laureate of the prestigious Pritzker Architecture Prize.

This option provides information about an achievement of Yamamoto, specifically being named the Laureate of the Pritzker Architecture Prize. While this is a significant accolade, it does not directly relate to his ability to blur the boundary between public and private spaces, which is the main theme of the paragraph.

(c) In the world of architecture, he stands out as a visionary voice advocating a return to a more interconnected way of living.

This option directly addresses Yamamoto's impact on architectural discourse and his advocacy for a more interconnected way of living. It aligns with the theme of blurring the boundary between public and private spaces, highlighting Yamamoto's visionary perspective and his contribution to challenging traditional architectural norms. Hence, this is the answer.

(d) He is deeply committed to building harmonious societies through his architectural practice.

This option focuses on Yamamoto's commitment to building harmonious societies through his architectural practice. While this information provides insight into Yamamoto's motivations, it does not directly relate to his ability to blur the boundary between public and private spaces, which is the main theme of the paragraph.

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72. **(a) (a) Sports careers are often short-lived due to the physical demands and risks of injury associated with athletic competition.**

This option provides insight into the challenges and limitations of pursuing a career in sports, specifically mentioning the short-lived nature of such careers due to physical demands and injury risks. It complements the discussion of rigorous training regimens and competition in the sports industry mentioned in the paragraph.

(b) Athletes often face pressure from coaches, sponsors, and fans to perform at their best, adding to the stress of professional sports.

This option highlights the pressure and stress that athletes experience from various stakeholders in the sports industry. While relevant, it doesn't directly relate to the idea of the pursuit of a sports career offering opportunities for

personal fulfillment and professional success, which is the main theme of the paragraph.

(c) The sports industry encompasses a wide range of career paths, including coaching, sports management, and sports journalism.

This option provides information about the diversity of career paths within the sports industry. While important, it doesn't directly address the opportunities for personal fulfillment and professional success that come with pursuing a career in sports, which is the main focus of the paragraph.

(d) Many athletes choose to pursue higher education alongside their sports careers to ensure long-term stability and success.

This option discusses the importance of higher education for athletes to ensure long-term stability and success. While relevant, it doesn't directly relate to the opportunities for personal fulfillment and professional success mentioned in the paragraph.

73. **(b) (a) Nashik overtook Kolar as the biggest tomato market in Asia.**

This option introduces information about Nashik and Kolar markets but doesn't directly relate to the missing lorry laden with tomatoes or the panic among traders in the Kolar agricultural produce market. Therefore, it's not relevant to the context provided in the paragraph.

(b) Panic and confusion reigned among traders in the Kolar agricultural produce market.

This option directly addresses the situation described in the paragraph, indicating panic and confusion among traders in the Kolar agricultural produce market. It aligns with the context provided and sets the stage for the subsequent details about the missing tomatoes and uncertainties surrounding the incident.

(c) A couple took the hijacked vehicle to a nearby market and sold the tomatoes there.

This option introduces new information about a couple taking the hijacked vehicle and selling the tomatoes, which is not mentioned in the paragraph. It does not directly relate to the panic among traders or the missing lorry laden with tomatoes described in the paragraph.

(d) Three traders jointly hired a lorry to carry tomatoes.

This option introduces information about three traders jointly hiring a lorry, which is not directly related to the panic among traders or the missing lorry laden with tomatoes described in the paragraph. Therefore, it's not relevant to the context provided.

74. **(c) Option (a)**

Analysis: Typically refers to a detailed examination of the elements or structure of something. It's often used in scientific or data-driven contexts.

Systematically: Refers to something done according to a fixed plan or system; methodically. It doesn't fit well with the context of someone intentionally slowing down in a race.

Waving: Refers to moving one's hand to and fro in greeting or as a signal. "Waving" seems too informal and less precise in the context of a deliberate gesture during a race.

Option (b)

Overview: Refers to a general review or summary of a subject. It's too broad and superficial for the context, which requires a more thorough examination.

Purposely: Means intentionally. It fits the context well, but the other words in the option are less suitable.

Beckoning: Means making a gesture with the hand, arm, or head to encourage someone to come nearer or follow. While this could work, it still doesn't fit as precisely as "signalling" in the context of a race.

Option (c)

Investigation: Means a formal or systematic examination or research. This is appropriate for a thorough examination of the runner's actions.

Deliberately: Means intentionally. This fits perfectly with the context of the runner intentionally slowing down.

Signalling: Means making an action or gesture to convey information or instructions. This fits well with the context of communicating with another runner during a race.

Option (d)

Appraisal: Refers to an act of assessing something or someone. While it's close in meaning to "investigation," it often implies a judgment or evaluation rather than a detailed inquiry.

Particularly: Means to a higher degree than is usual or average. This word doesn't fit the context of the sentence at all.

Speaking: Refers to the action of conveying information or expressing one's thoughts and feelings in spoken language. This doesn't fit the context of the non-verbal communication implied in the scenario.

75. **(b) Option (a)**

Similarity: Means the state or fact of being similar. "Without similarity in history" is awkward and not idiomatic.

Combating: Means taking action to reduce or prevent something bad or undesirable. This fits the context but not as precisely as some other words.

Prevalence: Refers to the commonness of a particular condition or disease. This word fits the context well, but the first word makes this option less suitable.

Option (b)

Precedent: Refers to an earlier event or action that is regarded as an example or guide to be considered in subsequent similar circumstances. "Without precedent in history" fits well.

Mitigating: Means making less severe, serious, or painful. This fits well in the context of reducing the impact of the virus.

Incidence: Refers to the occurrence, rate, or frequency of a disease. This fits well in the context.

Option (c)

Equivalent: Means equal in value, amount, function, meaning, etc. "Without equivalent in history" is not idiomatic.

Eradicating: Means destroying completely. This is too strong in the context of merely reducing the spread.

Toll: Refers to the number of deaths or casualties. This fits the context but the first word makes this option less suitable.

Option (d)

Parallel: Refers to something that is similar or analogous to something else. "Without parallel in history" does not fit well.

Controlling: Means exercising control or restraint. This does not fit well in the context of managing the spread of the virus as the previous word makes it redundant.

Outbreak: Refers to a sudden occurrence of something unwelcome, such as a disease. This fits but not as precisely as "incidence."

76. (b) a) **judiciously; systematic; inhibiting:** "systematic" doesn't match "prevalence" and "inhibiting" contradicts "promoting".
 (b) **discerningly; pervasive; fostering:** Fits well; "discerningly" suits "navigate data", "pervasive" matches "fake news", "fostering" aligns with "informed citizenship".
 (c) **discreetly; global; serving:** Doesn't fit context; "discreetly" is not appropriate for navigating data, "serving" is too vague.
 (d) **thoughtfully; holistic; furthering:** Doesn't fit context; "holistic" doesn't match "prevalence", "furthering" is too general.
77. (c) (a) **machinations; outstanding; determination:** "Outstanding" doesn't fit the context of negative events like climate change.
 (b) **errors; indescribable; information:** "Errors" and "indescribable" don't align with the context of intentional actions and control.
 (c) **plotting; catastrophic; prowess:** Best fit; "plotting" matches "intentional", "catastrophic" suits the context of climate change, and "prowess" fits "power".
 (d) **inaction; advantageous; performance:** "Inaction" and "advantageous" don't fit the context of deliberate, harmful actions.
78. (a) (a) **autocrats; bypassing; uniformly:** Fits best; "autocrats" aligns with populists, "bypassing" matches avoiding restraints, and "uniformly" supports the idea of widespread support.
 (b) **entrepreneurs; enforcing; presumably:** Doesn't fit; "enforcing" contradicts "bypassing", and "presumably" is too tentative.
 (c) **anarchists; unscrupulous; unanimously:** Doesn't fit; "anarchists" and "unscrupulous" don't match the context of populist leaders.
 (d) **democrats; avoiding; surprisingly:** Doesn't fit; "democrats" and "surprisingly" don't align with the idea of populists and echo chambers.

79. (a) (a) **complicated; advancing; truisms:** "Truisms" doesn't fit the context of biases that need to be challenged.
 (b) **multi-faceted; stimulating; archetypes:** "Stimulating" doesn't fit the context of promoting understanding, and "archetypes" doesn't fit as well as "stereotypes".
 (c) **pressing; nurturing; stereotypes:** Fits best; "pressing" matches the urgent challenge, "nurturing" aligns with fostering understanding, and "stereotypes" are the biases that need to be challenged.
 (d) **sophisticated; expediting; propositions:** "Expediting" doesn't fit the context of nurturing understanding, and "propositions" doesn't fit as well as "stereotypes".
80. (c) Option (a): This sentence is correct. "Callus" is used properly to describe the thickened skin that can develop on feet and protect them from damage.
 Option (b): This sentence is correct. "Callus" refers to the hard skin that can accumulate on feet and cause discomfort when it builds up too much.
 Option (c): This sentence is incorrect. The word "callus" is misused here. The correct word should be "callous," which means showing or having an insensitive and cruel disregard for others. The sentence should read, "He received fifty lashes on his feet delivered with callous indifference."
 Option (d): This sentence is correct. "Callus" is appropriately used to refer to the thickened skin that the doctor examined but did not treat.
81. (c) Option (a): This sentence is correct. "Diffuse" is appropriately used to mean spreading the smoke more widely and evenly.
 Option (b): This sentence is correct. "Diffuse" is correctly used to describe the spreading of the aroma throughout the house.
 Option (c): This sentence is incorrect. The word "diffused" is incorrectly used here. The correct word should be "defused," which means to make a situation less tense or dangerous. The sentence should read, "Realising that the argument between the two groups of students was getting out of control, the teacher defused the situation by quickly changing the topic."
 Option (d): This sentence is correct. "Diffuse" is correctly used to describe the spreading of light through the stained glass.
82. (a) (a) **Bans provide the community a chance to raise objections and ensure transparency.**
 In this sentence, the word "bans" is used incorrectly. A "ban" is an official or legal prohibition. However, a ban does not inherently provide a chance to raise objections or ensure transparency. Instead, processes such as public hearings, consultations, or review periods provide opportunities for raising objections and ensuring transparency.
 (b) **Organic farming bans the usage of all pesticides and involves manual weeding.**

This sentence correctly uses "bans" to indicate prohibition. It means organic farming prohibits the usage of pesticides, which makes sense.

(c) The government bans anyone with irregularities in their passports from travelling abroad.

Here, "bans" is correctly used to describe the government's prohibition of travel.

(d) The Child Marriage Restraint Act bans the marriage of those who are below 18 years of age.

This sentence correctly uses "bans" to refer to the legal prohibition of child marriage.

Thus, option (a) is the one where "bans" is used inappropriately, as it incorrectly suggests that a ban provides opportunities for objections and transparency.

83. **(d) Option (a):** This sentence appears to be grammatically correct and uses the word "stay" appropriately to mean residing temporarily with her grandparents and extended family during her summer holidays.

Option (b): This sentence seems to be grammatically correct and uses the word "stay" properly to mean remaining awake until her daughters come home.

Option (c): This sentence seems to be grammatically correct and uses the word "stay" correctly to refer to a temporary suspension or delay in legal proceedings.

Option (d): This sentence seems to be grammatically correct, but the phrase "stay away" might be slightly inappropriate. It suggests deliberately keeping a distance, whereas the intended meaning seems to be that the cattle wander away from their usual location. A more suitable word might be "stray."

84. **(d) Option (a):** This sentence is correct. The word "proscribes" is used appropriately. "Proscribes" means to forbid or prohibit. However, as the subject in the sentence is "the rules" which is plural, it should be followed by a plural verb, which should be "proscribe". However, this option cannot be eliminated on the basis of this technicality as it uses the right word.

Option (b): This sentence is correct. "Proscribes" is appropriately used to mean forbidding or prohibiting late-night parties before an important game.

Option (c): This sentence is correct. "Proscribes" is appropriately used to mean forbidding or prohibiting employees from disclosing confidential information.

Option (d): This sentence is incorrect. "Proscribes" is used inappropriately here. "Proscribes" means to forbid or prohibit, but it's used incorrectly in the context of giving instructions. The correct word should be "prescribes", which means to stipulate or specify.

85. **(c) Option (a):** The sentence talks about the disruption of someone's concentration due to noise. It uses the phrase "train of thought" correctly, describing the sequence of connected ideas in one's mind. Therefore, this option seems appropriate.

Option (b): This sentence discusses travel options for seeing landscapes. It mentions taking a train, which is a common mode of transportation alongside roads and

planes. So, this option appears to use the word "train" appropriately.

Option (c): Here, the sentence describes a police investigation where they follow a "train of blood" to locate a body. However, "train" doesn't quite fit here; it's typically used for sequences or series of things, not paths or trails. So, this option seems to contain the word used inappropriately. The correct word should be "trail", which means "a course followed or to be followed".

Option (d): The sentence discusses a friend rescuing a stray dog and wanting to train and domesticate it. "train" implies teaching the dog certain behaviors so that it becomes used to living with humans. Thus, the word "train" is used correctly

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86. **(32415)** Sentence 3 introduces the topic of philanthropy, highlighting the emergence of a strategic approach to giving and how it varies across countries. It sets the stage for the discussion about philanthropy in different regions. The point about various countries is continued in sentence 2. It provides specific data about private giving in India, offering a point of comparison for the philanthropic landscape in other countries. Thus 32 becomes a pair. Sentence 4 adds another layer to the comparison by presenting data about total giving in China, further contextualizing the differences in philanthropic practices among countries. Sentence 1 contrasts the level of giving in America with the data provided for India and China, highlighting the significant scale of philanthropy in America compared to other countries. Sentence 5 is the final sentence as it provides a general comparison between organized philanthropy in Asia and the West, summarizing the overall comparison and emphasizing the smaller scale of philanthropy in Asia compared to Western countries. Overall, this order creates a coherent flow of ideas, starting with the emergence of

strategic giving, providing specific data for India and China, contrasting philanthropy in America, and concluding with a general comparison between Asia and the West.

87. **(3241)**

Sentence 3 introduces the alarming statistic about lightning-related deaths, providing the context for the subsequent sentences and makes a mandatory pair with sentence 2 as sentence 2 introduces a response to the issue: demands for compensation for the families of lightning strike victims. It adds another layer of complexity to the situation. Sentence 1 follows up on the announcement by the Minister, providing information about the measures being taken to address the issue, such as distributing pamphlets to raise awareness and prevent further casualties. Sentence 1 introduces a complicating factor: despite efforts to raise awareness about lightning dangers, some farmers still ignore weather warnings, potentially putting themselves at risk. Notice the word "however" in sentence 1. Thus, it presents a contrast to what is mentioned in 4. Hence, 3241 is the correct order.

88. **(25143)**

The paragraph starts with sentence 2. This sentence introduces the central theme of the paragraph, highlighting the evolving nature of social media platforms and their decreasing emphasis on social interactions. Sentence 2 is followed by sentence 5. This sentence expands upon the central theme by providing an example of how social media platforms are adapting their content delivery methods based on user behavior rather than traditional social connections. Sentence 1 supports the central theme by presenting evidence of a decline in user activity related to social media, indicating a shift in user behavior away from extensive personal sharing. Sentence 4 discusses one consequence of the changing social media landscape, highlighting the migration of online discussions and interactions to closed platforms that offer more privacy and control over who can participate. Sentences 1 and 4 form a pair. The paragraph ends with sentence 3 as it provides further insight into the consequences of the evolving social media landscape, particularly in the context of political campaigning, where strategies are adapting to the shift towards more private interactions.

In this order, the paragraph begins by introducing the central theme of changing social media dynamics, followed by examples and evidence that support and expand upon this theme. The paragraph concludes by discussing the consequences of these changes, offering insights into how various sectors, such as politics, are adapting to the evolving social media landscape.

89. **(4132)**

Sentence 4 introduces the idea that being in space makes your spine stretch out a bit, making you taller. Sentence 1 adds to that by explaining that in space, your blood moves towards your upper body, like your heart and head, because of the lack of gravity pulling it down. Sentence 3 is connected to sentence 1 as it talks about how your heart reacts to all that blood moving towards your upper body; it thinks there's too much blood so it shrinks. Sentence 2 wraps up the discussion by saying that these effects aren't permanent, once you come back to Earth, your heart and spine go back to normal.

By pairing these sentences, we can understand how being in space affects the body's physiology and how it adapts to the environment, with the effects being temporary and reversible once back on Earth. Hence, the correct order is 4132

90. **(3142)**

Sentence 3 introduces the cultural significance of kava in the Pacific region, mentioning its different names in various countries. Sentence 1 builds on that by describing how kava is prepared and its role in social gatherings, emphasizing its importance as a shared drink among friends, guests, and colleagues. Sentence 4 describes the effects of drinking kava, mentioning how it leads to relaxation and a feeling of numbness. Sentence 2 adds to that by describing how regular kava drinkers perceive this feeling, referring to it as a state of peace and a way for the body and mind to unwind. This paragraph explains the cultural significance of kava in the Pacific region and how it is prepared and shared among people, as well as the effects it has on those who consume it, and how they perceive those effects. Hence, the correct order is 3142.

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