



IPMAT Indore 2025 Question Paper

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Quantitative Ability SA

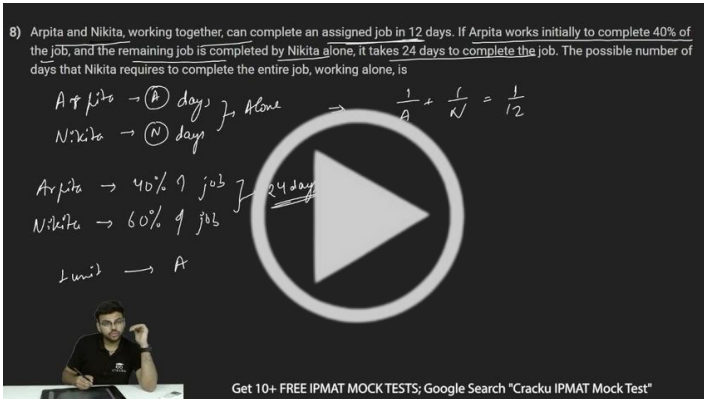
1. Arpita and Nikita, working together, can complete an assigned job in 12 days. If Arpita works initially to complete 40% of the job, and the remaining job is completed by Nikita alone, it takes 24 days to complete the job. The possible number of days that Nikita requires to complete the entire job, working alone, is

8) Arpita and Nikita, working together, can complete an assigned job in 12 days. If Arpita works initially to complete 40% of the job, and the remaining job is completed by Nikita alone, it takes 24 days to complete the job. The possible number of days that Nikita requires to complete the entire job, working alone, is

Arpita → (A) days } Alone
 Nikita → (N) days } Alone

Arpita → 40% of job } 24 days
 Nikita → 60% of job } 24 days

Unit → A

$$\frac{1}{A} + \frac{1}{N} = \frac{1}{12}$$


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VIDEO SOLUTION





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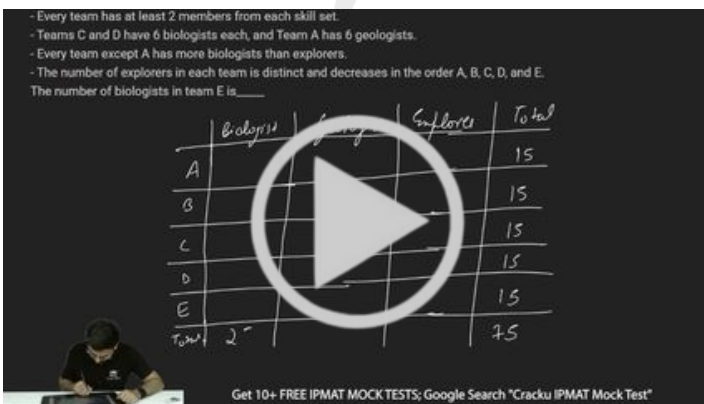
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2. Five teams - A, B, C, D, and E - each consisting of 15 members, are going on expeditions to five different locations. Each team includes members from three different skill sets: biologists, geologists, and explorers. However, the number of members from each skill set varies by team, and each member has only one speciality. The total number of biologists, geologists, and explorers is equal. The following additional information is available
- Every team has at least 2 members from each skill set.
 - Teams C and D have 6 biologists each, and Team A has 6 geologists.
 - Every team except A has more biologists than explorers.
 - The number of explorers in each team is distinct and decreases in the order A, B, C, D, and E.
- The number of biologists in team E is _____

- Every team has at least 2 members from each skill set.
 - Teams C and D have 6 biologists each, and Team A has 6 geologists.
 - Every team except A has more biologists than explorers.
 - The number of explorers in each team is distinct and decreases in the order A, B, C, D, and E.
 The number of biologists in team E is _____

	Biologists	Geologists	Explorers	Total
A				15
B				15
C				15
D				15
E				15
Total	2			75



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VIDEO SOLUTION

3. If a, b, c are three distinct natural numbers, all less than 100, such that $|a - b| + |b - c| = |c - a|$, then the maximum possible value of b is _____

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10) If a, b, c are three distinct natural numbers, all less than 100, such that $|a - b| + |b - c| = |c - a|$, then the maximum possible value of b is _____

$a < b < c$ $c < a < b$

$b = 99$ $c = 100$

$(a - 99) + (99 - 100) = |99 - a|$

$99 - a + 1 = 99 - a$

$99 - a = 99 - a$

$\rightarrow a \rightarrow 1$

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4. Eight teams participate in a tournament where each team plays against every other team exactly once. In a particular year, one team got suspended after playing 3 matches, due to a disciplinary issue. The organisers decided to proceed, nonetheless, with the remaining matches. The total number of matches that were played in the tournament that year is _____

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Eight teams participate in a tournament where each team plays against every other team exactly once. In a particular year, one team got suspended after playing 3 matches, due to a disciplinary issue. The organisers decided to proceed, nonetheless, with the remaining matches. The total number of matches that were played in the tournament that year is _____

Answer: _____

① $8C_2 = \frac{8 \times 7 \times 6!}{2! \times 6!} = \frac{8 \times 7 \times 6!}{2 \times 6!} = 28$

$28 - 3 = 25$

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5. If the sum of the first 21 terms of the sequence: $\ln \frac{a}{b}, \ln \frac{a}{b\sqrt{b}}, \ln \frac{a}{b^2}, \ln \frac{a}{b^2\sqrt{b}}, \dots$ is $\ln \frac{a^m}{b^n}$, then the value of $m + n$ is _____

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1) If the sum of the first 21 terms of the sequence: $\ln \frac{a}{b}, \ln \frac{a}{b^2}, \ln \frac{a}{b^3}, \ln \frac{a}{b^4}, \dots, \ln \frac{a}{b^{21}}$, then the value of $m_1 + m_2$ is

$a_1 = \ln \left(\frac{a}{b} \right), a_2 = \ln \left(\frac{a}{b^2} \right) = \ln \left(\frac{a}{b} \right) - \ln(b) = \ln \left(\frac{a}{b} \right) - \ln(b)^{-1} = \ln \left(\frac{a}{b} \right) - \ln(b)$

$a_3 = \ln \left(\frac{a}{b^3} \right) = \ln \left(\frac{a}{b} \right) - \ln(b^2) = \ln \left(\frac{a}{b} \right) - 2 \ln(b)$

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6. The English and Math exams were conducted separately for a class of 120 students. The number of students who did not appear for the English exam is twice that of those who did not appear for the Math exam. The number of students who passed the Math exam is twice that of those who appeared but failed the English exam. If the number of students who passed the English exam is twice the number of students who appeared but failed the Math exam, then the number of students who appeared but failed the English exam is _____

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2) The English and Math exams were conducted separately for a class of 120 students. The number of students who did not appear for the English exam is twice that of those who did not appear for the Math exam. The number of students who passed the Math exam is twice that of those who appeared but failed the English exam. If the number of students who passed the English exam is twice the number of students who appeared but failed the Math exam, then the number of students who appeared but failed the English exam is _____

$\bar{E} = 2\bar{M} \quad E_f = 2M_f$

$M_p = 2E_f$

	NOT APPEARED	APPEARED
ENGLISH		PASSED FI
MATH		

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7. If $A = \begin{bmatrix} 2 & n \\ 4 & 1 \end{bmatrix}$ such that $A^3 = 27 \begin{bmatrix} 4 & q \\ p & r \end{bmatrix}$, then $p + q + r$ equals _____

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3) If $A = \begin{bmatrix} 2 & n \\ 4 & 1 \end{bmatrix}$ such that $A^3 = 27 \begin{bmatrix} 4 & q \\ p & r \end{bmatrix}$, then $p + q + r$ equals _____

$$A^2 = \begin{bmatrix} 2 & n \\ 4 & 1 \end{bmatrix} \begin{bmatrix} 2 & n \\ 4 & 1 \end{bmatrix} = \begin{bmatrix} 4 & 2n+3n \\ 8 & 4n+1 \end{bmatrix} = \begin{bmatrix} 4 & 5n \\ 8 & 4n+1 \end{bmatrix}$$

$$A^3 = A^2 \cdot A = \begin{bmatrix} 4 & 5n \\ 8 & 4n+1 \end{bmatrix} \begin{bmatrix} 2 & n \\ 4 & 1 \end{bmatrix} = \begin{bmatrix} 8+20n & 4n^2+7n \\ 16n+28 & 4n+1 \end{bmatrix}$$

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8. Five teams - A, B, C, D, and E - each consisting of 15 members, are going on expeditions to five different locations. Each team includes members from three different skill sets: biologists, geologists, and explorers. However, the number of members from each skill set varies by team, and each member has only one speciality. The total number of biologists, geologists, and explorers is equal.

The following additional information is available

- Every team has at least 2 members from each skill set.
- Teams C and D have 6 biologists each, and Team A has 6 geologists.
- Every team except A has more biologists than explorers.
- The number of explorers in each team is distinct and decreases in the order A, B, C, D, and E.

The number of teams having more geologists than biologists is _____

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4) Five teams - A, B, C, D, and E - each consisting of 15 members, are going on expeditions to five different locations. Each team includes members from three different skill sets: biologists, geologists, and explorers. However, the number of members from each skill set varies by team, and each member has only one speciality. The total number of biologists, geologists, and explorers is equal.

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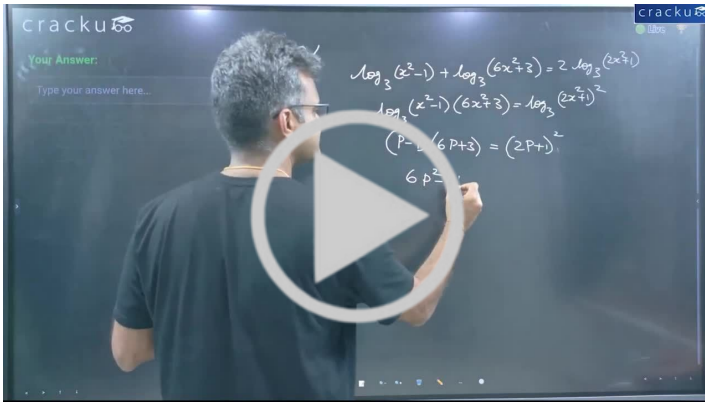
The number of teams having more geologists than biologists is _____

↳ 3rd question
↳ 3 question

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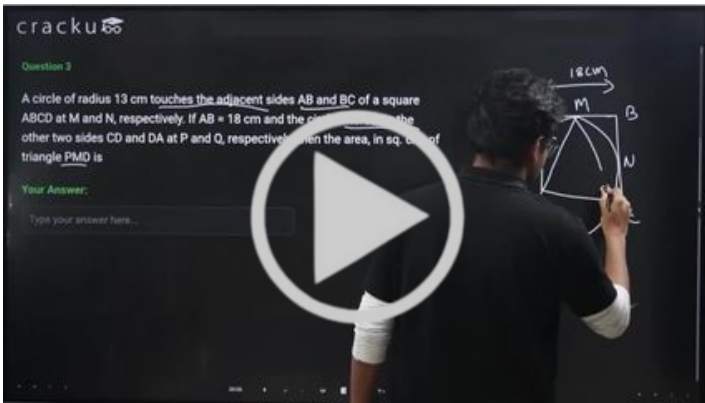
VIDEO SOLUTION

9. If $\log_3(x^2 - 1)$, $\log_3(2x^2 + 1)$ and $\log_3(6x^2 + 3)$ are the first three terms of an arithmetic progression, then the sum of the next three terms of the progression is



VIDEO SOLUTION

10. A circle of radius 13 cm touches the adjacent sides AB and BC of a square ABCD at M and N, respectively. If AB = 18 cm and the circle intersects the other two sides CD and DA at P and Q, respectively, then the area, in sq. cm, of triangle PMD is



VIDEO SOLUTION

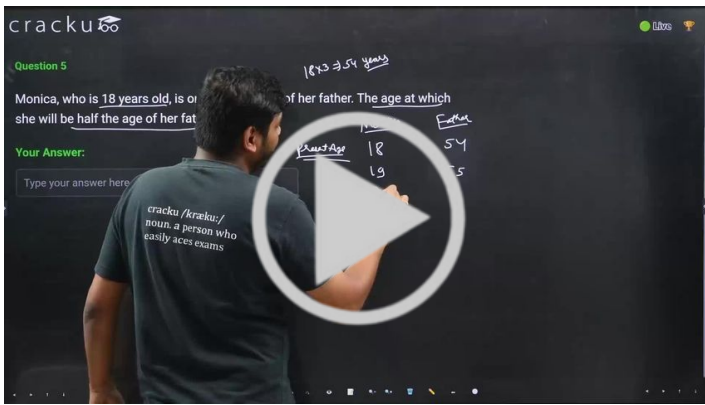
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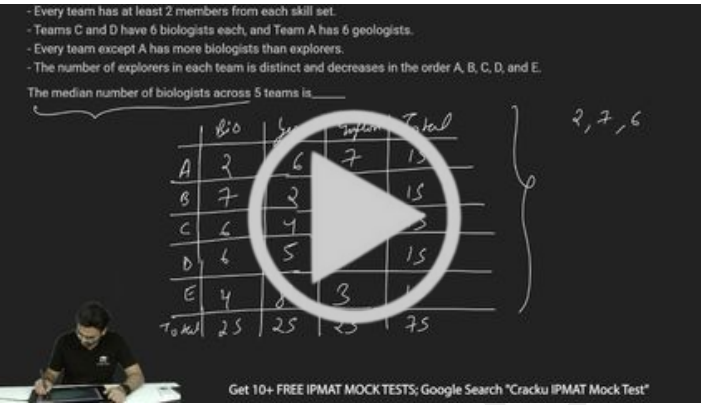
11. Monica, who is 18 years old, is one-third the age of her father. The age at which she will be half the age of her father is ____



VIDEO SOLUTION

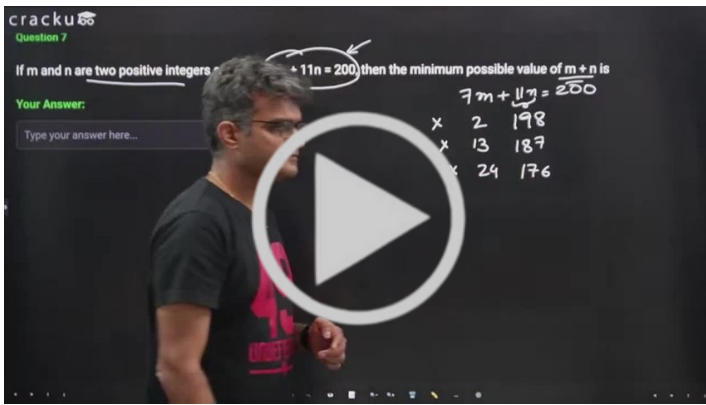
12. Five teams - A, B, C, D, and E - each consisting of 15 members, are going on expeditions to five different locations. Each team includes members from three different skill sets: biologists, geologists, and explorers. However, the number of members from each skill set varies by team, and each member has only one speciality. The total number of biologists, geologists, and explorers is equal. The following additional information is available
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 - Teams C and D have 6 biologists each, and Team A has 6 geologists.
 - Every team except A has more biologists than explorers.
 - The number of explorers in each team is distinct and decreases in the order A, B, C, D, and E.

The median number of biologists across 5 teams is _____



VIDEO SOLUTION

13. If m and n are two positive integers such that $7m + 11n = 200$, then the minimum possible value of $m + n$ is



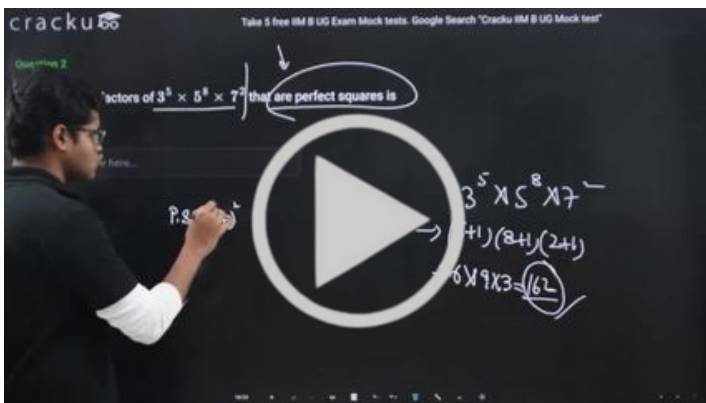
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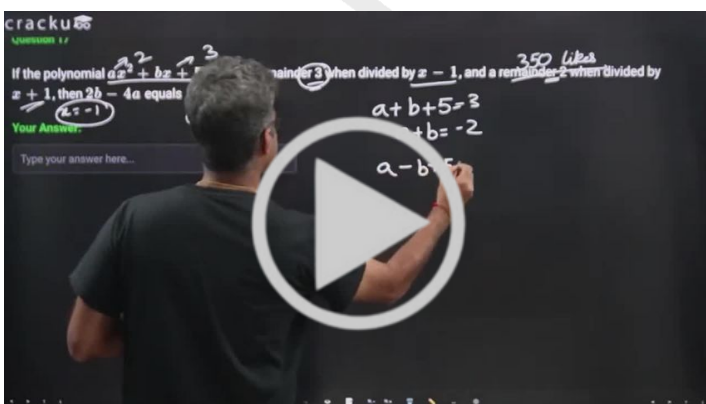
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14. The number of factors of $3^5 \times 5^8 \times 7^2$ that are perfect squares is



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15. If the polynomial $ax^2 + bx + 5$ leaves a remainder 3 when divided by $x - 1$, and a remainder 2 when divided by $x + 1$, then $2b - 4a$ equals



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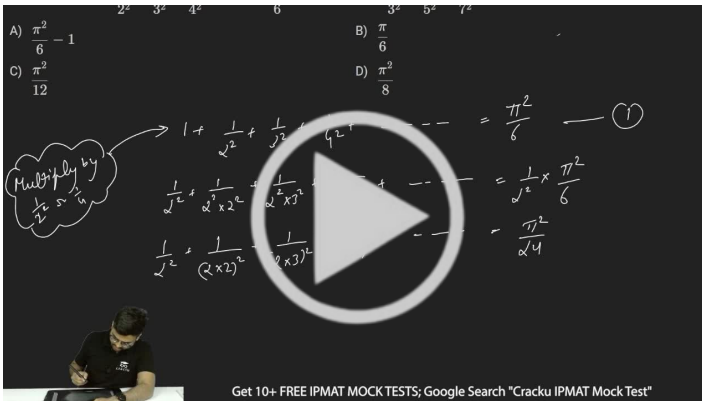
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Quantitative Ability MCQ

16. Given that $1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots = \frac{\pi^2}{6}$, the value of $1 + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2} + \dots$ is
- A $\frac{\pi^2}{6} - 1$
 - B $\frac{\pi}{6}$
 - C $\frac{\pi^2}{12}$
 - D $\frac{\pi^2}{8}$



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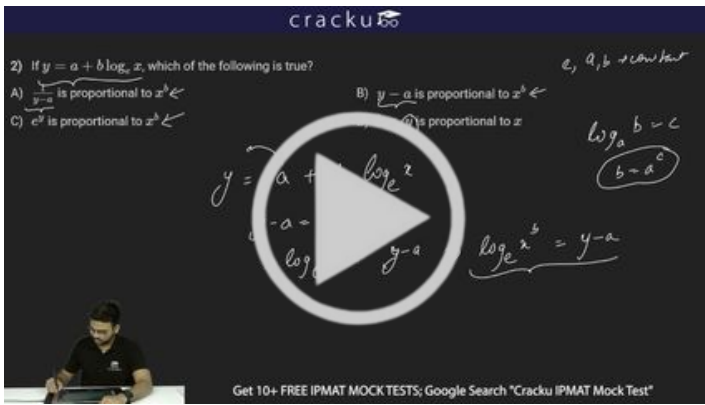
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17. If $y = a + b \log_e x$, which of the following is true?

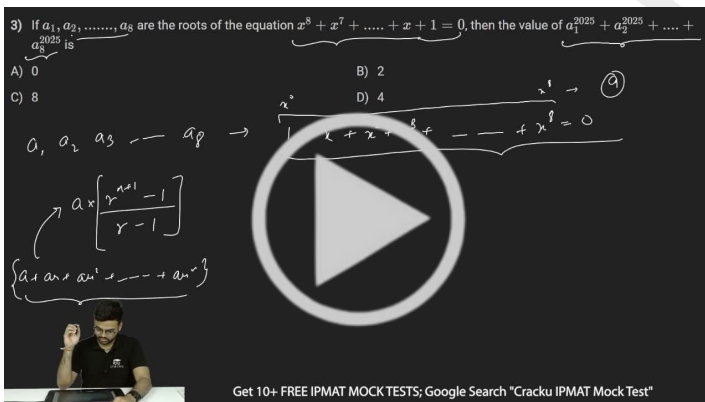
- A $\frac{1}{y-a}$ is proportional to x^b
- B $y - a$ is proportional to x^b
- C e^y is proportional to x^b
- D $\log_e y$ is proportional to x



VIDEO SOLUTION

18. If a_1, a_2, \dots, a_8 are the roots of the equation $x^8 + x^7 + \dots + x + 1 = 0$, then the value of $a_1^{2025} + a_2^{2025} + \dots + a_8^{2025}$ is

- A 0
- B 2
- C 8
- D 4



VIDEO SOLUTION

19. Suppose a, b and c are three real numbers such that $\text{Max}(a, b, c) + \text{Min}(a, b, c) = 15$, and $\text{Median}(a, b, c) - \text{Mean}(a, b, c) = 2$. Then the median of a, b and c is

- A 11
- B 10.5
- C 10
- D 9.5

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4) Suppose a, b and c are three real numbers such that $\text{Max}(a, b, c) + \text{Min}(a, b, c) = 15$, and $\text{Median}(a, b, c) - \text{Mean}(a, b, c) = 2$. Then the median of a, b and c is:

A) 11
B) 10.5
C) 10
D) 9.5

Assume $a < b < c$

$\text{Max}(a, b, c) = c$
 $\text{Min}(a, b, c) = a$
 $\text{Median}(a, b, c) = b$
 $\text{Mean}(a, b, c) = \frac{a+b+c}{3}$

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20. If $\log_{25} [5 \log_3 (1 + \log_3 (1 + 2 \log_2 x))] = \frac{1}{2}$ then x is:

- A 4
B 16
C 2
D 8

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5) If $\log_{25} [5 \log_3 (1 + \log_3 (1 + 2 \log_2 x))] = \frac{1}{2}$ then x is:

A) 4
B) 16
C) 2
D) 8

$\log_a b = c \Rightarrow b = a^c$

$\log_{25} [5 \log_3 (1 + \log_3 (1 + 2 \log_2 x))] = \frac{1}{2}$

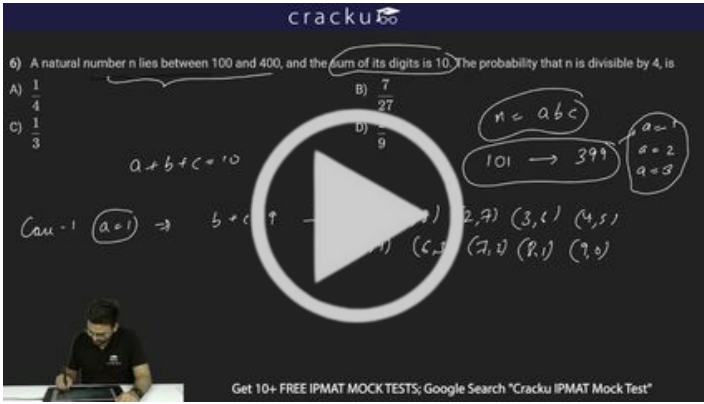
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21. A natural number n lies between 100 and 400, and the sum of its digits is 10. The probability that n is divisible by 4, is

- A $\frac{1}{4}$
B $\frac{7}{27}$
C $\frac{1}{3}$

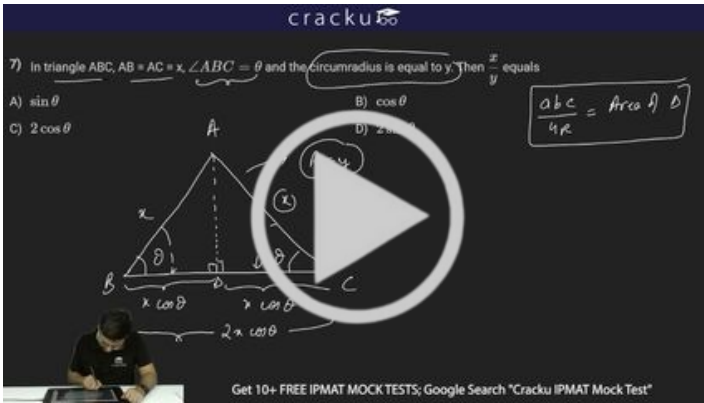
D $\frac{2}{9}$



VIDEO SOLUTION

22. In triangle ABC, $AB = AC = x$, $\angle ABC = \theta$ and the circumradius is equal to y . Then $\frac{x}{y}$ equals

- A $\sin \theta$
- B $\cos \theta$
- C $2 \cos \theta$
- D $2 \sin \theta$



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23. If $8x^2 - 2kx + k = 0$ is a quadratic equation in x , such that one of its roots is p times the other, and p, k are positive real numbers, then k equals

- A $(p + \frac{1}{p})$

B $2\left(p + \frac{1}{p}\right)$

C $2\left(\sqrt{p} + \frac{1}{\sqrt{p}}\right)^2$

D $\left(\sqrt{p} + \frac{1}{\sqrt{p}}\right)^2$

8) If $8x^2 - 2kx + k = 0$ is a quadratic equation in x , such that one of its roots is p times the other, and p, k are positive real numbers, then k equals

A) $\left(p + \frac{1}{p}\right)$ B) $2\left(p + \frac{1}{p}\right)$ Root = α
 C) $2\left(\sqrt{p} + \frac{1}{\sqrt{p}}\right)^2$ D) $\left(\sqrt{p} + \frac{1}{\sqrt{p}}\right)^2$ Other = $p\alpha$

$8x^2 - 2kx + k = 0$

$\alpha + p\alpha = -\frac{-2k}{8} \Rightarrow \alpha(1+p) = \frac{k}{4} \Rightarrow \alpha = \frac{k}{4(1+p)}$

$\alpha \times p\alpha = \frac{k}{8} \Rightarrow \frac{k^2}{16(1+p)^2} = \frac{k}{8} \Rightarrow k = 2\left(p + \frac{1}{p}\right)$

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▶ VIDEO SOLUTION

24. Let $A(1, 3)$ and $B(5, 1)$ be two points. If a line with slope m intersects AB at an angle of 45° , then the possible values of m are

A $7, \frac{1}{7}$

B $3, \frac{1}{3}$

C $-3, \frac{1}{3}$

D $5, -\frac{1}{5}$

are

A) $7, \frac{1}{7}$ B) $3, \frac{1}{3}$ C) $-3, \frac{1}{3}$ D) $5, -\frac{1}{5}$

$\theta = 45^\circ$

$\tan \theta = \left| \frac{m_2 - m_1}{1 + m_1 m_2} \right|$

$\tan 45^\circ = 1 = \left| \frac{m - \frac{1}{5}}{1 + m \cdot \frac{1}{5}} \right|$

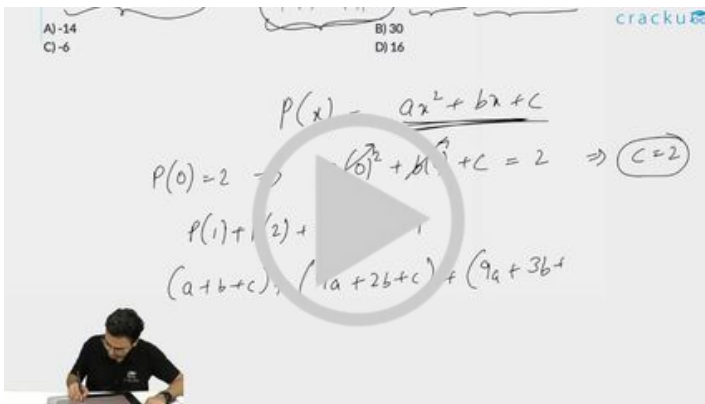
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25. Let $P(x)$ be a quadratic polynomial such that $\begin{vmatrix} P(0) & P(1) \\ P(0) & P(2) \end{vmatrix} = 0$. Let $P(0) = 2$ and $P(1) + P(2) + P(3) = 14$.

Then $P(4)$ equals

- A -14
- B 30
- C -6
- D 16



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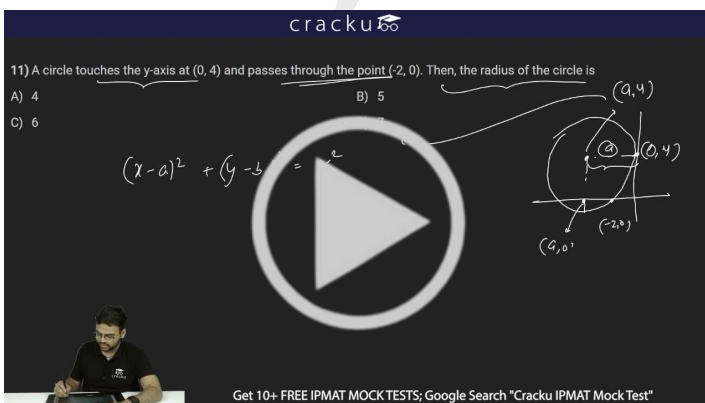
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26. A circle touches the y-axis at $(0, 4)$ and passes through the point $(-2, 0)$. Then, the radius of the circle is

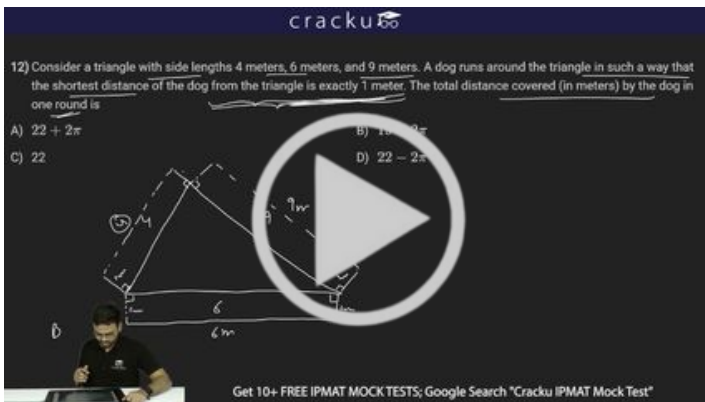
- A 4
- B 5
- C 6
- D 7



VIDEO SOLUTION

27. Consider a triangle with side lengths 4 meters, 6 meters, and 9 meters. A dog runs around the triangle in such a way that the shortest distance of the dog from the triangle is exactly 1 meter. The total distance covered (in meters) by the dog in one round is

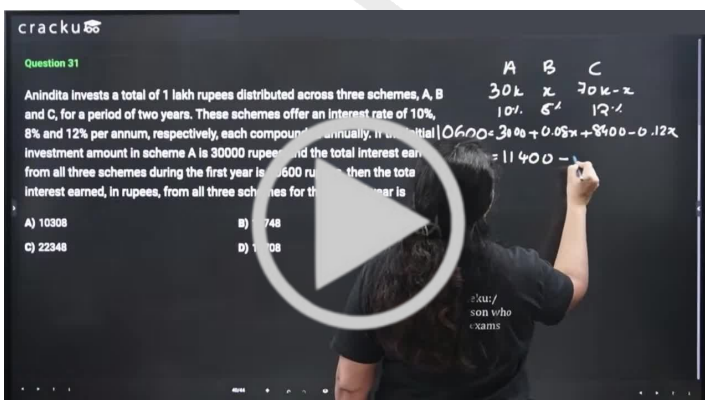
- A $22 + 2\pi$
- B $19 + 2\pi$
- C 22
- D $22 - 2\pi$



VIDEO SOLUTION

28. Anindita invests a total of 1 lakh rupees distributed across three schemes, A, B and C, for a period of two years. These schemes offer an interest rate of 10%, 8% and 12% per annum, respectively, each compounded annually. If the initial investment amount in scheme A is 30000 rupees and the total interest earned from all three schemes during the first year is 10600 rupees, then the total interest earned, in rupees, from all three schemes for the second year is

- A 10308
- B 11748
- C 22348
- D 19708



29. Let $f(x) = a^2x^2 + 2bx + c$ where, $a \neq 0$, b, c are real numbers and x is a real variable then

- A $f(x)$ has a maximum and a minimum
- B $f(x)$ has a minimum and no maximum
- C $f(x)$ has a maximum and no minimum
- D $f(x)$ has no minimum and no maximum

30. The area of the triangle, formed by the straight lines $y = 0$, $12x - 5y = 0$, and $3x + 4y = 7$ is

- A $\frac{35}{27}$
- B $\frac{14}{9}$
- C $\frac{28}{9}$
- D $\frac{35}{54}$

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3) The area of the triangle, formed by the straight lines $y = 0$, $12x - 5y = 0$ and $3x + 4y = 7$ is

A) $\frac{35}{9}$
 B) $\frac{14}{9}$
 C) $\frac{28}{9}$
 D) $\frac{54}{9}$

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31. Area of a regular octagon inscribed in a circle of radius 1 unit is:

- A $2\sqrt{2}$
 B $2 + \sqrt{2}$
 C $\frac{9}{2\sqrt{2}}$
 D $\sqrt{10}$

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4) Area of a regular octagon inscribed in a circle of radius 1 unit is:

A) $2\sqrt{2}$
 B) $2 + \sqrt{2}$
 C) $\frac{9}{2\sqrt{2}}$

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32. Two swimmers, Ankit and Bipul, start swimming from opposite ends of a swimming pool at the same time. Ankit can cover the length of the pool once in 10 minutes. Bipul can cover the length of the pool once in 15 minutes. They swim back and forth for 80 minutes without stopping. The number of times they meet each other is-

- A 7
 B 6
 C 5

D 8

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5) Two swimmers, Ankit and Bipul, start swimming from opposite ends of a swimming pool at the same time. Ankit can cover the length of the pool once in 10 minutes. Bipul can cover the length of the pool once in 15 minutes. They swim back and forth for 80 minutes without stopping. The number of times they meet each other is-

A) 7
B) 6
C) 5
D) 8

Handwritten notes:
 Ankit = 10 min = $3x/min$
 Bipul = 15 min = $2x/min$
 80 minutes
 30x
 74 minutes
 20x
 $\frac{20x}{5x} = 6 \text{ minutes} \rightarrow 6^{\text{th}} \text{ meet}$

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33. The sum of the first 5 terms of a geometric progression is the same as the sum of the first 7 terms of the same progression. If the sum of the first 9 terms is 24, then the 4th term of the progression is

- A -48
- B -24
- C 24
- D 48

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Handwritten notes on a blackboard:
 $S_5 = a \frac{(r^5 - 1)}{r - 1}$
 $S_7 = a \frac{(r^7 - 1)}{r - 1}$
 $a \frac{(r^5 - 1)}{r - 1} = a \frac{(r^7 - 1)}{r - 1}$
 $(r^5 - 1) = (r^7 - 1)$
 $r^5(1 - r^2) = (1 - r^2)$
 $r^5(1 - r^2) - (1 - r^2) = 0$
 $(r^5 - 1)(1 + r) = 0$
 $r^5 = 1$
 $r = 1$
 $r = -1$

VIDEO SOLUTION

34. The set of all values of x satisfying the inequality $\log_{\left(x + \frac{1}{x}\right)} \left[\log_2 \left(\frac{x-1}{x+2} \right) \right] > 0$ is

- A (2, 5)
- B (-5, -2)
- C (5, ∞)
- D Null set

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7) The set of all values of x satisfying the inequality $\log_{(x+1)} \left[\log_2 \left(\frac{x-1}{x+2} \right) \right] > 0$ is

A) (2, 5) B) (-5, -2)

C) (5, ∞)

$\log_b a < 0$
 $b > a < 1$

$x+1 > 0$
 $x+1 > 2$
 $x > 1$

$x+1 < 0$
 $x+1 < -2$
 $x < -3$

$x > 0$

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35. Let $S_1 = \{100, 105, 110, 115, \dots\}$ and $S_2 = \{100, 95, 90, 85, \dots\}$ be two series in arithmetic progression. If a_k and b_k are the k^{th} terms of S_1 and S_2 , respectively, then $\sum_{k=1}^{20} a_k b_k$ equals _____.

- A 137275
- B 138250
- C 137225
- D 135375

8) Let $S_1 = \{100, 105, 110, 115, \dots\}$ and $S_2 = \{100, 95, 90, 85, \dots\}$ be two series in arithmetic progression. If a_k and b_k are the k^{th} terms of S_1 and S_2 , respectively, then $\sum_{k=1}^{20} a_k b_k$ equals _____.

A) 137275 B) 138250

C) 137225 D) 135375

$S_1 = 100, 100+5, 100+10, \dots$

$S_2 = 100, 100-5, 100-10, \dots$

$\sum_{k=1}^{20} a_k b_k = \sum_{k=1}^{20} (100+5k)(100-5k)$

$= \sum_{k=1}^{20} (100^2 - 25k^2)$

$= 20 \times 100^2 - 25 \sum_{k=1}^{20} k^2$

$= 200000 - 25 \times \frac{20 \times 21 \times 41}{6}$

$= 200000 - 25 \times 2940$

$= 200000 - 73500$

$= 126500$

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36. A and B take part in a rifle shooting match. The probability of A hitting the target is 0.4, while the probability of B hitting the target is 0.6. If A has the first shot, post which both strike alternately, then the probability that A hits the target before B hits it is

- A $\frac{1}{2}$
- B $\frac{10}{19}$

C $\frac{2}{3}$

D $\frac{9}{19}$

cracku

9) A and B take part in a rifle shooting match. The probability of A hitting the target is 0.4, while the probability of B hitting the target is 0.6. If A has the first shot, post which both strike alternately, then the probability that A hits the target before B hits it is

A) $\frac{1}{2}$
B) $\frac{19}{19}$
C) $\frac{2}{3}$
D) $\frac{9}{19}$

Handwritten notes on the video include:
 - A sequence of shots: A B A B A B
 - A probability tree diagram showing $P(A) = 0.4$ and $P(B) = 0.6$.
 - A formula: $P(A) + P(\bar{A}\bar{B}) + \dots$

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VIDEO SOLUTION

37. Which of the following numbers is divisible by $3^{10} + 2$

A $3^{20} + 4$

B $3^{30} + 2$

C $3^{20} + 8$

D $3^{30} + 8$

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10) Which of the following numbers is divisible by $3^{10} + 2$ $\rightarrow (a+b)$

A) $3^{20} + 4$
B) $3^{30} + 2$
C) $3^{20} + 8$
D) $3^{30} + 8$

Handwritten notes on the video include:
 - The formula $a^2 - b^2 = (a+b)(a-b)$.
 - The substitution $a = 3^{10}$ and $b = 2$.
 - The calculation $3^{20} + 4 = (3^{10} + 2)(3^{10} - 2) \rightarrow (X)$.
 - The calculation $3^{30} + 8 = (3^{10} + 2)(3^{20} - 3^{10} + 4) \rightarrow (X)$.

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38. Let A and B be two finite sets such that $n(A - B), n(A \cap B), n(B - A)$ are in an arithmetic progression. Here $n(X)$ denotes the number of elements in a finite set X. If $n(A \cup B) = 18$, then $n(A) + n(B)$ is _____

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Instructions

The table given below provides the details of monthly sales (in lakhs of rupees) and the value of products returned by the customers (as a percentage of sales) of an e-commerce company in three product categories for the year 2024. Net sales (in lakhs of rupees) is defined as the difference between sales (in lakhs of rupees) and the value of products returned (in lakhs of rupees).

Month	Sales (in lakhs of rupees)			Value of products returned (as a percentage of sales)		
	Apparel	Footwear	Electronics	Apparel	Footwear	Electronics
January	262	304	289	1.1%	1%	1%
February	270	313	287	0.8%	1%	1%
March	276	323	293	2.0%	1%	1%
April	278	324	324	0.8%	1%	1%
May	281	329	329	3.2%	0.7%	1%
June	290	333	323	1.0%	1%	1%
July	284	330	333	1.7%	0%	0%
August	282	328	330	0.8%	0%	2%
September	288	335	329	2.0%	0%	0%
October	292	338	333	0.8%	0%	2%
November	293	341	332	1.4%	0%	0%
December	300	348	338	0.8%	0%	0%

Net Sales = Sales - Value of Product returned

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VIDEO SOLUTION

42. For which categories the value of the products returned (as a percentage of sales) increased for three consecutive months?

- A Only Electronics
- B Only Apparel
- C Both Apparel and Footwear
- D Only Footwear

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The table given below provides the details of monthly sales (in lakhs of rupees) and the value of products returned by the customers (as a percentage of sales) of an e-commerce company in three product categories for the year 2024. Net sales (in lakhs of rupees) is defined as the difference between sales (in lakhs of rupees) and the value of products returned (in lakhs of rupees).

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January	262	304	289	1.1%	1%	1%
February	270	313	287	0.8%	1%	1%
March	276	323	293	2.0%	1%	1%
April	278	324	324	0.8%	1%	1%
May	281	329	329	3.2%	0.7%	1%
June	290	333	323	1.0%	1%	1%
July	284	330	333	1.7%	0%	0%
August	282	328	330	0.8%	0%	2%
September	288	335	329	2.0%	0%	0%
October	292	338	333	0.8%	0%	2%
November	293	341	332	1.4%	0%	0%
December	300	348	338	0.8%	0%	0%

Net Sales = Sales - Value of Product returned

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43. By what percentage the net sales for June increased as compared to May in the Footwear category?

- A 62.58 percent
- B 7.21 percent
- C 18.97 percent
- D 60.87 percent

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Instructions

The table given below provides the details of monthly sales (in lakhs of rupees) and the value of products returned by the customers (as a percentage of sales) of an e-commerce company across three product categories for the year 2024. Net sales (in lakhs of rupees) is defined as the difference between sales (in lakhs of rupees) and the value of products returned (in lakhs of rupees).

Month	Sales (in lakhs of rupees)			Value of products returned (in lakhs of rupees)	
	Apparel	Footwear	Electronics	Apparel	Electronics
January	262	104	289	11%	7%
February	279	113	287	9%	2%
March	276	121	281	20%	7%
April	278	92	329	9%	3%
May	289	89	379	12%	3%
June	299	111	321	19%	4%
July	281	119	331	17%	8%
August	292	88	339	9%	2%
September	288	118	359	20%	8%
October	222	109	383	18%	2%
November	229	81	292	14%	8%
December	219	92	308	10%	10%

Net Sales = Sales - Value of Product returned

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44. Among the following four months, for which month the contribution of the Apparel category in the total monthly sales was the highest?

- A January
- B April
- C December
- D August

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Month	Sales (in lakhs of rupees)			Value of products returned (in lakhs of rupees)	
	Apparel	Footwear	Electronics	Apparel	Electronics
January	262	104	289	11%	7%
February	279	113	287	9%	2%
March	276	121	281	20%	7%
April	278	92	329	9%	3%
May	289	89	379	12%	3%
June	299	111	321	19%	4%
July	281	119	331	17%	8%
August	292	88	339	9%	2%
September	288	118	359	20%	8%
October	222	109	383	18%	2%
November	229	81	292	14%	8%
December	219	92	308	10%	10%

Net Sales = Sales - Value of Product returned

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45. Among the following four months, for which month the value of the Footwear returned (in lakhs of rupees) was the highest?

- A September
- B July
- C June
- D March

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Instructions

The table given below provides the details of monthly sales (in lakhs of rupees) and the value of products returned by the customers (as a percentage of sales) of an e-commerce company across three product categories for the year 2024. Net sales (in lakhs of rupees) is defined as the difference between sales (in lakhs of rupees) and the value of products returned (in lakhs of rupees).

Month	Sales (in lakhs of rupees)			Value of products returned (in lakhs of rupees)		
	Apparel	Electronics	Home Appliances	Apparel	Electronics	Home Appliances
January	252	304	289	1.1%	1%	1%
February	270	313	287	0.8%	1%	1%
March	276	323	291	0.9%	1%	1%
April	278	324	292	0.8%	1%	1%
May	281	326	293	0.9%	1%	1%
June	283	327	294	0.9%	1%	1%
July	284	328	295	0.9%	1%	1%
August	285	329	296	0.9%	1%	1%
September	286	330	297	0.9%	1%	1%
October	287	331	298	0.9%	1%	1%
November	288	332	299	0.9%	1%	1%
December	289	333	300	0.9%	1%	1%

Net Sales = Sales - Value of Product returned

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Verbal Ability

Instructions [46 - 51]

Meta is recalibrating content on its social media platforms as the political tide has turned in Washington, with Mark Zuckerberg announcing last week that his company plans to fire its US fact-checkers. Fact-checking evolved in response to allegations of misinformation and is being watered down in response to accusations of censorship. Social media does not have solutions to either. Community review -introduced by Elon Musk at X and planned by Zuckerberg for Facebook and Instagram - is not a significant improvement over fact-checking. Having Washington lean on foreign governments over content moderation does not benefit free speech. Yet, that is the nature of the social media beast, designed to amplify bias.

Information and misinformation continue to jostle on social media at the mercy of user discretion. Social media now has enough control over all other forms of media to broaden its reach. It is the connective tissue for mass consumption of entertainment, and alternative platforms are reworking their engagement with social media. Technologies are shaping up to drive this advantage further through synthetic content targeted precisely at its intended audience. Meta's algorithm will now play up politics because it is the flavour of the season.

The Achilles' Heel of social media is informed choice which could turn against misinformation. Its move away from content moderation is driven by the need to be more inclusive, yet unfiltered content can push users away from social media towards legacy forms that have better moderation systems in place. Lawmakers across the world are unlikely to give social media a free run, even if Donald Trump is working on their case. Protections have already been put in place across jurisdictions over misinformation. These may be difficult to dismantle, even if the Republicans pull US-owned social media companies further to the right.

Media consumption is, in essence, evidence-based judgement that mediums must adapt to. Content moderation, not free speech, is the adaptation mechanism. Musk and Zuckerberg are not exempt.

46. The writer implies that

- A uncensored content will always have more appeal than controlled content.
- B social media's innate strength is the user's inability to fact check.
- C social media can never be discarded by its users.
- D older forms of media will regain users because of its controls.



47. The writer argues that social media

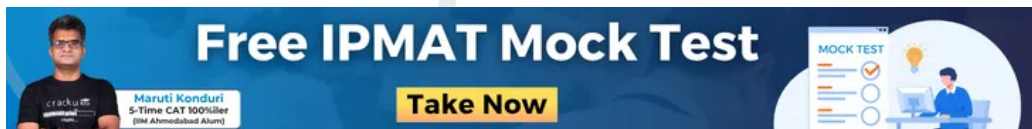
- A remains unaffected by global debates amongst lawmakers on misinformation.
- B has become the preferred way to access entertainment.
- C flourishes because it can publish any material.
- D is in a difficult position because it cannot adapt to new policies.

48. The writer's conclusion is that the information available on social media is linked to

- A the need for deregulation.
- B the individual's right to free speech.
- C the global legal systems' support of free speech.
- D the policies of the governments in power.

49. Social media has succeeded in

- A ignoring technology and artificial content.
- B finding alternative means for fact-checking.
- C becoming independent of other media.
- D controlling other media that depend on it.



50. Technologies are enabling social media to

- A enlarge its sphere of influence and persuasion.
- B understand that algorithms cannot control its content.
- C accept the current trends as emphasised by algorithms.
- D readjust its interaction with competitors.

51. The inherent downside associated with social media is that it

- A does not address the problem of the digital divide.
- B results in unremitting expansion of freedom of expression.
- C creates and spreads much innate and acquired prejudice.
- D reinforces existing objectivity among the users.

Instructions [52 - 57]

According to the French philosopher Jean Baudrillard, commodities available for consumption are not inherently negative things. Baudrillard tried to interpret consumption in modern societies by engaging with the 'cargo myth' prevalent among the indigenous Melanesian people living in the South Pacific. The Melanesians did not know what aeroplanes were. However, they saw that these winged entities descended from the air for white people and appeared to make them happy. They also noted that aeroplanes never descended for the Melanesian people.

The Melanesian natives noted that the white people had placed objects similar to the aeroplane on the ground. They concluded that these objects were attracting the aeroplanes in the air and bringing them to the ground. Through a magical process, the aeroplanes were bringing plenty to the white people and making them happy. The Melanesian people concluded that they would need to place objects that simulated the aeroplane on the ground and attract them from the air. Baudrillard believes that the cargo myth holds an important analogy for the ways in which consumers engage with objects of consumption.

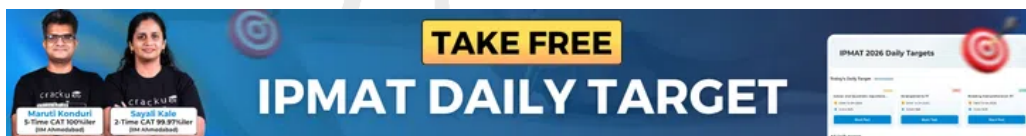
According to Baudrillard, the modern consumer "sets in place a whole array of sham objects, of characteristic signs of happiness, and then waits for happiness to alight". For instance, modern consumers believe that they will get happiness if they buy the latest available version of a mobile phone or automobile. However, consumption does not usually lead to happiness. While consumers should ideally be blaming their heightened expectations for their lack of happiness, they blame the commodity instead.

They feel that they should have waited for the next version of a mobile phone or automobile before buying the one they did. The version they bought is somehow inferior and therefore cannot make them happy. Baudrillard argues that consumers have replaced 'real' happiness with 'signs' of happiness. This results in the endless deferment of the arrival of total happiness.

In Baudrillard's words, "in everyday practice, the blessings of consumption are not experienced as resulting from work or from a production process; they are experienced as a miracle". Modern consumers view consumption in the same magical way as the Melanesian people viewed the aeroplanes in the cargo myth. Television commercials also present objects of consumption as miracles. As a result, commodities appear to be distanced from the social processes which lead to their production. In effect, objects of consumption are divorced from the reality which produces them.

52. How can consumption be made more satisfying?

- A By banning television commercials that promise real happiness.
- B By understanding the connection between production and consumption.
- C By recognising that commodities produce miraculous change.
- D By rejecting colonialism and all other forms of economic oppression.



53. Which of the following is an argument made by Baudrillard?

- A Consumers value signs more than the real.
- B Television commercials are at the heart of unhappiness experienced by consumers.
- C Production and consumption are magical processes.
- D Melanesian people coped with the inequality of colonialism by creating myths.

54. How does Baudrillard engage with the cargo myth?

- A He uses it to show that consumption is a blessing.

- B He uses it as a metaphor to critique modern consumption.
- C He uses it to describe the suffering of Indigenous people.
- D He uses it to show that consumers should consume more serious objects.

55. Why are consumers unhappy with commodities that they have just bought?

- A Because they have exaggerated expectations of commodities.
- B Because television commercials do not create enough hype about commodities.
- C Because the Law of Diminishing Marginal Commodities comes into play.
- D Because they focus on improved functionality of commodities.



56. What is Baudrillard's position on total happiness?

- A It is perpetually delayed.
- B It comes with patience and waiting.
- C It prioritises production overconsumption.
- D It results from ethical consumption.

57. What is Baudrillard's position on consumption?

- A It is a utilitarian process.
- B It is a positive process.
- C It is an egalitarian process.
- D It is an irrational process.

58. Deepak is an unpleasant person, but we all _____ because his sister is a close friend of ours.

- A put him down
- B put him aside
- C put up with him
- D put along with him



59. We hope that the government's new policies will _____ a period of economic growth.

- A usher in

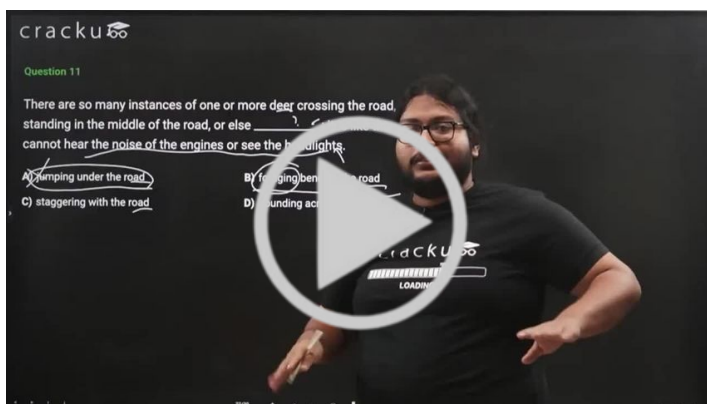
- B set in
- C turn up
- D set forth

60. When she inherited some jewellery from a distant relative, she had no idea of its worth and decided _____.

- A to get an approval
- B to get it appreciated
- C to have it appraised
- D to have it apprised

61. There are so many instances of one or more deer crossing the road, or just standing in the middle of the road, or else _____; it is like the deer cannot hear the noise of the engines or see the headlights.

- A jumping under the road
- B foraging beneath the road
- C staggering with the road
- D bounding across the road



[VIDEO SOLUTION](#)



62. Everyone wondered how the travel vlogger could go around the world all through the year and _____.

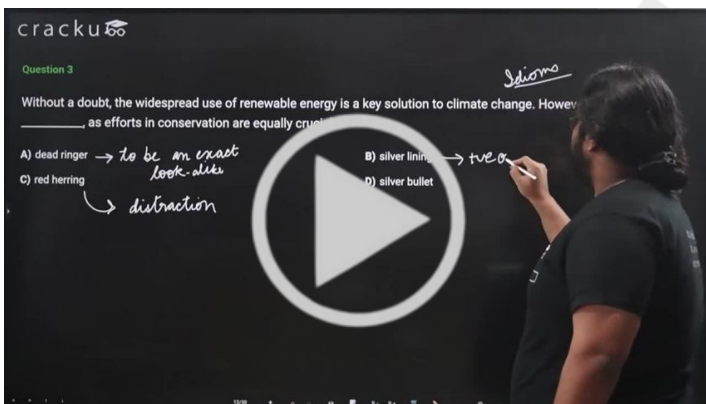
- A manage his itinerant life style
- B manage his itinerary life style
- C manage his iterative life style
- D manage his itinerary in his life style



VIDEO SOLUTION

63. Without a doubt, the widespread use of renewable energy is a key solution to climate change. However, it is not a _____, as efforts in conservation are equally crucial.

- A dead ringer
- B silver lining
- C red herring
- D silver bullet



VIDEO SOLUTION

64. The labourers who were fired broke into the office building and destroyed some of the machinery. Rather than finding a solution to their problems, they _____

- A exacerbated the situation
- B extended their troubles
- C exaggerated their hardships
- D extenuated the circumstance



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65. Among scientists, the discovery of the double helix structure of DNA and the genetic code it incorporates is widely regarded to be one of the most significant scientific discovery of the twentieth century.
- A regarded for being one of the most significant scientific discoveries
 - B regarded as one of the most significant scientific discoveries
 - C regarded like one of the most significant scientific discovery
 - D regarded being one of the most significant scientific discoveries
66. Thank goodness, the damage to the car was neglectful.
- A was negligible
 - B was neglecting
 - C was neglectable
 - D was negligent
67. Although the new policy aims to increase efficiency, reducing costs, and enhancing employee satisfaction , some employees feel that the changes are too abrupt and poorly communicated.
- A increase efficiency, reducing the costs and enhanced employee satisfaction
 - B increasing efficiency, reducing of costs, and enhancing of employee satisfaction
 - C increase the efficiency, reduce the costs and enhancing employee satisfaction
 - D increase efficiency, reduce costs, and enhance employee satisfaction



68. If the President knew that his allies would let him down so suddenly, he would have handled them with the greatest care.
- A Had the President knowledge that his allies would let him down
 - B Had the President known that his allies would let him down
 - C If the President could know beforehand that his allies would let him down
 - D If the President knew that his allies can let him down
69. When I had to leave town due to office work, I had my brother to give food to my dog twice a day.
- A had my brother feed my dog
 - B had my brother giving food to my dog
 - C had my brother who fed my dog
 - D had my brother to feed my dog

70. A report published in Lancet Diabetes and Endocrinology has called for an overhaul of our understanding of obesity. An over-reliance on using Body Mass Index [BMI] as a metric has the peculiar effect of leading to both underdiagnosis and overdiagnosis of the condition. _____. BMI does not give accurate information about how fat is distributed in an individual's body. It frequently fails to capture the true state of health of an individual. A person's BMI may indicate they are "obese", but their organs and bodily functions may be absolutely normal. Every individual is a unique constellation – not only of genes and other biological variables, but also socio-economic conditions and habits.

- A Obesity is the end result of multiple factors, and BMI can pinpoint the cause of the problem.
- B Further, much of the information on diabetes, obesity or BMI available on social media is misleading.
- C BMI reading can help the doctor to accurately prescribe the appropriate dosage to reduce fat.
- D This is because BMI does not provide a reliable picture of health, nor any direct measure of fat.

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71. An island in Japan boasts of numerous dairy farms that own nearly one million cows, and supplies 70% of the milk sold in the country. These dairy farms have now begun to use cow manure to produce hydrogen. The methane from cow manure mingles with steam in a high-temperature environment to produce hydrogen, which is used to electrify the local zoo. _____.

- A The Indian government too, should replicate this, and use such technology to produce hydrogen
- B It is a case study of a certain animal that is useful in providing energy for several other animals
- C This is an exemplary way of creating a sustainable source of energy using innovative technology
- D This shows how Japan has always used technology to help animals

72. As globalization held sway over the world, communities, which used to live in relative isolation, sought access to the wider world, and in the process, they parted with their own language and adopted a new lingua franca. The loss of language, however, does not merely mean the loss of a mode of communication or the loss of a few thousand words. _____. So, when a language dies, a way of thinking dies with it.

- A A certain school of thought regrets the demise of local languages but in recent times revival movements have emerged across the world, especially in India
- B A potentially endangered language can sometimes appear to be thriving, or on the other hand, it can show signs of declining
- C Languages exist not only for the purposes of practical communication; they convey a linguistic community's entire mindset and its culture
- D Since evolution and change in languages is a part of history, most of the languages spoken today would be scarcely recognizable from what they were a few thousand or maybe even a few hundred years ago

73. On the first day of January 2025, the Indian Meteorological Department [IMD] announced that 2024 was the hottest year on record. A study by the Council on Energy, Environment and Water shows that nearly eight out of ten Indians live in districts that are at risk of either a flood, a cyclone, or a drought. Nearly twenty-three States in India are heatwave-prone. _____. In the summer of 2024, India recorded more than 44,000 cases of heatstroke and over 300 heat-related mortalities, as per the bulletin of the

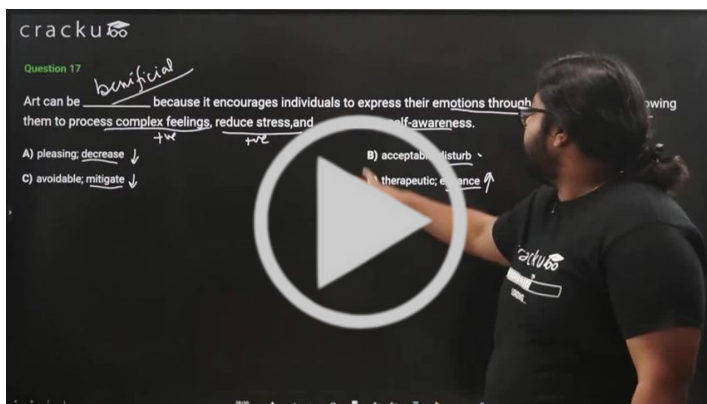
Ministry of Health and Family Welfare. Water reservoirs and the energy demand that keeps India powered are impacted too. During a ten-day-long heatwave in Delhi, peak power demand was 16% than the previous year.

- A According to the Council, more than 20% of the population is not affected by climate change
- B The record-breaking heat of the summer of 2024 resulted in an unpredictable and delayed monsoon
- C However, the people of these districts are given sufficient compensation for loss of life and property
- D The increasing heat stress remains a major challenge, affecting public health and economic productivity



74. Art can be _____ because it encourages individuals to express their emotions through a creative outlet, allowing them to process complex feelings, reduce stress, and _____ self-awareness.

- A pleasing; decrease
- B acceptable; disturb
- C avoidable; mitigate
- D therapeutic; enhance



VIDEO SOLUTION

75. Astronauts who stayed for an _____ period of time at the International Space Station displayed a remarkable level of _____ endurance and mental _____.

- A extensive; dysfunctional; agility
- B explicit; stoic; integrity
- C expanded; stern; acuity
- D extended; physical; resilience

76. While Curcumin, which is an _____ found in turmeric helps to reduce _____, extremely high doses of it can _____ headache and nausea.

- A enzyme; abrasion; infuse

- B alkali; infection; promote
- C alchemy; injury; cause
- D ingredient; inflammation; induce



77. The notion of personhood is _____ on something more than a particular type of genetic material within human beings: it arises only with the larger-scale structural _____ of that material, which permits capacities like _____, thought, and moral agency.
- A dependent; disorganisation; deconstruction
 - B interdependent; division; differentiation
 - C built; distribution; calibration
 - D premised; organisation; consciousness
78. Since chronic stress can _____ the immune system, making individuals more susceptible to illness and _____ their overall well-being, healthcare practitioners often recommend mindfulness practices and proper sleep to _____ these negative effects.
- A undermine; elevate; impede
 - B compromise; impair; counter
 - C paralyse; improve; diminish
 - D endanger; preserve; decrease
79. Psychologists urge users to remember that social media rarely reflects the full complexity of real life. Influencers often _____ a carefully curated online persona, which can _____ unrealistic standards and occasionally _____ negative self-comparisons amongst their followers.
- A endorse; foster; provoke
 - B maintain; generate; trigger
 - C advocate; perpetuate; stimulate
 - D profess; inspire; release



Instructions [80 - 85]

CONVERSATION ANALYSIS: Read the following transcript and choose the answer that is closest to each of the questions that are based on the transcript.

Lucia Rahilly (Global Editorial Director, The McKinsey Podcast): Today we're talking about the next big arenas of competition, about the industries that will matter most in the global business landscape, which you describe as arenas of competition. What do we mean when we use this term?

Chris Bradley (Director, McKinsey Global Institute): If I go back and look at the top ten companies in 2005, they were in traditional industries such as oil and gas, retail, industrials, and pharmaceuticals. The average company was worth about 250 billion. If I advance the clock forward to 2020, nine in ten of those companies have been replaced, and by companies that are eight times bigger than the old guards.

And this new batch of companies comes from these new arenas or competitive sectors. In fact, they're so different that we have a nickname for them. If you're a fan of Harry Potter, it's wizards versus muggles. Arena industries are wizard-ish; we found that there's a set of industries that play by very different set of economic rules and get very different results, while the rest, the muggles (even though they run the world, finance the world, and energize the world), play by a more traditional set of economic rules.

Lucia Rahilly: Could we put a finer point on what is novel or different about the lens that you applied to determine what's a wizard and what's a muggle?

Chris Bradley: Wizards are defined by growth and dynamism. We looked at where value is flowing and the places where value is moving.

And where is the value flowing? What we see is that this set of wizards, which represent about ten percent of industries, hog 45 percent of the growth in market cap. But there's another dimension or axis too, which is dynamism. That is measured by a new metric we've come up with called the "shuffle rate." How much does the bottom move to the top? It turns out that in this set of wizard-ish industries, or arenas, the shuffle rate is much higher than it is in the traditional industry.

Lucia Rahilly: So, where are we seeing the most profit?

Chris Bradley: The economic profit, which is the profit you make minus the cost for the capital you employ is in the wizard industries. It's where R&D happens; they're two times more R&D intensive. They're big stars, the nebulae, where new business is born.

80. In the context of the conversation, "dynamism" most closely refers to

- A the slow, gradual growth and morphing of established companies.
- B the rapid and frequent changes in leadership and market position within an industry.
- C the never-changing reliance on established and unchanging business practices.
- D the stability and predictability of traditional industries.

81. In the context of the conversation, the term "arenas of competition" refers to

- A specific companies that are considered to be powerful competitors.
- B government regulations that control business competition.
- C physical locations where businesses compete.
- D broad categories of industries where companies engage in competitive activities.

82. "Muggles" refers to industries that

- A are characterized by rapid and frequent changes.
- B exhibit high levels of market capitalization growth.
- C operate under traditional economic principles.
- D are primarily focused on technological innovation.



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83. Which one of the following does "shuffle rate" not measure?

- A Volatility of market leadership.
- B Churn within the arena of competition.
- C Overall profitability of traditional industries.
- D Relative change within an industry.

84. "Wizard" industries are characterized by

- A a slower rate of market capitalization growth.
- B a higher concentration of economic profit and research and development.
- C a reliance on traditional economic rules and practices.
- D lower research and development spending.

85. Which of the following best and correctly summarises the main idea of the conversation?

- A The global economy is shifting back towards traditional industries, as they offer more stable returns.
- B Newer, dynamic industries, termed "wizards," are experiencing significantly greater growth and profit compared to traditional industries.
- C Traditional industries are consistently more profitable than newer, "wizard-ish" industries.
- D The terms "wizard" and "muggle" are used to describe the magical elements of business success.



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.

1. Among its major urban centres, Harappa and Mohenjo-Daro stand out as prime examples of this architectural prowess, revealing large public structures, residential areas, and sophisticated water management systems indicative of a complex societal structure.
2. Showing remarkable sophistication for its time, this ancient culture developed meticulously planned cities, complete with advanced sanitation systems and intricate grid layouts that underscore its profound understanding of urban design and engineering.
3. Economically, the civilisation thrived on a foundation of extensive trade networks, connecting them with distant lands, alongside a robust agricultural system that sustained its large populations and facilitated surplus production.
4. Despite its impressive achievements and longevity, the reasons behind the eventual decline of this remarkable civilisation remain largely enigmatic, prompting ongoing research and speculation among historians and archaeologists.
5. The Indus Valley Civilisation, flourishing in the Bronze Age, represents one of humanity's earliest urban societies, evidenced by archaeological discoveries dating back thousands of years.

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.

1. Using the wonders of Artificial Intelligence (AI), they quickly improved upon those skills to become far more dexterous.
2. Inside a robotics laboratory of the Toyota Research Institute, a group of robots is busy cooking. There is nothing special about that; robotic chefs have been around for a while.
3. Despite their extraordinary culinary capabilities, these robots are not destined for a career in catering.
4. But these robots are more proficient than most: flipping pancakes, slicing vegetables, and making pizzas with ease.
5. The difference is that instead of being laboriously programmed to carry out their tasks, the Toyota robots have been taught only a basic set of skills.

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.

1. Seven of the ten worst-affected countries (including India) are low- and middle-income countries.
2. Between 1993 and 2022, India was the sixth worst-affected country in terms of fatalities and damage sustained from extreme weather events wrought by the climate crisis.
3. High-income nations, whose economies are founded in the industrial era use of fossil fuels, meanwhile, insist that growing economies, especially India and China, shoulder greater responsibility.
4. This reinforces the developing world's contention that it has had to bear a disproportionate burden of climate afflictions despite having contributed little to the crisis.



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.

1. When we take time to notice these moments, we discover hidden beauty that sparks our creative thoughts because creativity isn't just about rare, amazing events—it's also about finding the special in the ordinary.
2. Creativity is often seen as the ability to look at the world in a new way—to turn everyday sights, sounds, and experiences into art or ideas.
3. In fact, inspiration can come from small details of daily life: the gentle warmth of morning sunlight on a kitchen counter, the steady sound of traffic outside, or the brief smile of a stranger on a busy street.
4. Many people wrongly think that true creativity only comes from big ideas or exciting adventures.

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.

1. In drought conditions, water often depletes in the topsoil and remains accessible only in the deeper subsoil layers.

2. A new study gives new insights into how the acid changes root growth angles to enable plants to reach out deeper subsoils in search of water.
3. Plants rely on their root systems, the primary organs for interacting with soil, to actively seek water.
4. Abscisic acid plays an important role in helping plants adapt to these challenging conditions.

The advertisement is a horizontal banner with a light blue background. In the center, the text "JOIN IPMAT" is written in bold black letters above a green button that says "WHATSAPP GROUP". On either side of the button are two WhatsApp icons. To the left of the first icon is a portrait of Maruti Kenduri, a man with glasses wearing a black t-shirt with the "Cracku" logo. Below his portrait is a text box that reads "Maruti Kenduri", "5-Time CAT 100%iler", and "(IIT Ahmedabad Alum)". To the right of the second icon is a portrait of Sayali Kale, a woman with long dark hair wearing a black t-shirt with the "Cracku" logo. Below her portrait is a text box that reads "Sayali Kale", "2-Time CAT 99.97%iler", and "(IIT Ahmedabad Alum)".

Answers

Quantitative Ability SA

1.20	2.4	3.98	4.24	5.147	6.40	7.12	8.2
9.15	10.153	11.36	12.6	13.20	14.30	15.11	

Quantitative Ability MCQ

16.D	17.C	18.C	19.B	20.B	21.B	22.D	23.C
24.C	25.C	26.B	27.B	28.B	29.B	30.B	31.A
32.A	33.B	34.D	35.B	36.B	37.D	38.A	39.A
40.B	41.D	42.C	43.A	44.B	45.B		

Verbal Ability

46.D	47.B	48.D	49.D	50.A	51.C	52.B	53.A
54.B	55.A	56.A	57.D	58.C	59.A	60.C	61.D
62.A	63.D	64.A	65.B	66.A	67.D	68.B	69.A
70.D	71.C	72.C	73.D	74.D	75.D	76.D	77.D
78.B	79.B	80.B	81.D	82.C	83.C	84.B	85.B
86.52134	87.24513	88.2143	89.2431	90.3142			

Explanations

Quantitative Ability SA

1.20

Let the total work done be 1 unit.

Now, let us assume the total number of days taken by Arpita is A, then her efficiency will be = $\frac{1}{A}$

And the total number of days taken by Nikita is N, then her efficiency will be = $\frac{1}{N}$

It is given that they complete the work together in 12 days. Thus $\Rightarrow \frac{1}{A} + \frac{1}{N} = \frac{1}{12} \rightarrow 1$

Now, it is given that Arpita works initially to complete 40% of the job, which means she does 0.4 units of work. For 1 unit, she was taking A days; for 0.4 units of work, she will take 0.4 A days.

Then, Nikita completes the remaining job alone. Thus, Nikita will do 0.6 units of work, which will take 0.6N days. It is given that in this way, they take 24 days to complete the job.

$$\Rightarrow 0.4A + 0.6N = 24 \rightarrow 2$$

$$\Rightarrow 2A + 3N = 120$$

$$\Rightarrow A = \frac{(120 - 3N)}{2} \rightarrow 3$$

From eq. 1, we can get $\Rightarrow \frac{(A + N)}{AN} = \frac{1}{12}$

$$\Rightarrow 12A + 12N = AN$$

Substituting the value of A from eq. 3 -

$$\Rightarrow 12 \left(\frac{120 - 3N}{2} \right) + 12N = \left(\frac{120 - 3N}{2} \right) N$$

$$\Rightarrow 1440 - 36N + 24N = 120N - 3N^2 \quad (\text{Dividing the entire equation by 3})$$

$$\Rightarrow 480 - 4N = 40N - N^2$$

$$\Rightarrow N^2 - 44N + 480 = 0$$

$$\Rightarrow N^2 - 24N - 20N + 480 = 0 \quad (\text{Splitting the middle term})$$

$$\Rightarrow (N - 24)(N - 20) = 0$$

$$\Rightarrow N = 20 \text{ or } N = 24$$

Thus, Nikita alone takes to complete that work is either 20 or 24 days.

 VIDEO SOLUTION

2.4

There are five teams, each with 15 members, for a total of 75 members.

Also, the number of biologists, geologists and explorers is equal, thus this will be equal to 25.

It is given that Teams C and D have 6 biologists each, and Team A has 6 geologists.

	TEAM A	TEAM B	TEAM C	TEAM D	TEAM E	TOTAL
BIOLOGISTS			6	6		25
GEOLOGISTS	6					25
EXPLORERS						25
TOTAL	15	15	15	15	15	75

Now, each team has at least 2 members from each skill set, and the number of explorers in each team is distinct and decreases in the order A, B, C, D, and E. Thus, if we assume there are 2 explorers in team E, then team D, C, B and A will have 3, 4, 5, and 6 explorers respectively. Thus, the total number of explorers will be $(2 + 3 + 4 + 5 + 6 = 20)$, less than 25. Now, if we assume there are 3 explorers in team E, then team D, C, B and A will have 4, 5, 6, and 7 explorers respectively. Thus, the total number of explorers will be $(3 + 4 + 5 + 6 + 7 = 25)$, equal to 25. This is the only case valid; in all the other cases, it will be either more than 25 or less than 25.

	TEAM A	TEAM B	TEAM C	TEAM D	TEAM E	TOTAL
BIOLOGISTS			6	6		25
GEOLOGISTS	6					25
EXPLORERS	7	6	5	4	3	25
TOTAL	15	15	15	15	15	75

In the diagram, we can see that team A has 2 biologists, and teams C and D will have 4 and 5 geologists, respectively.

Now, each team has more biologists than explorers except team A. Thus, the number of biologists in team B will be 7 (If it is 8, then the number of geologists will be 1, which is not possible, because there are 2 members of each kind in each team). Thus, our final table will look like this.

	TEAM A	TEAM B	TEAM C	TEAM D	TEAM E	TOTAL
BIOLOGISTS	2	7	6	6	4	25
GEOLOGISTS	6	2	4	5	8	25
EXPLORERS	7	6	5	4	3	25
TOTAL	15	15	15	15	15	75

Thus, the number of biologists in team E is 4.

 VIDEO SOLUTION

3.98

$|a - b| + |b - c| = |c - a|$. This equation is only valid when b lies between a and c . Thus, there are two cases possible - $a < b < c$ or $c < b < a$

Case - 1 :- $a < b < c$

Now, we need to find the maximum value of b . All, a , b , and c are natural numbers is less than 100, and we $c > b$. Thus, if we assume the value of $c = 99$ and $b = 98$ (which are the two maximum possible values), then -

$|a - 98| + |98 - 99| = |99 - a|$, and we assumed that $a < b$, thus $a < 98$.

$$\Rightarrow 98 - a + 1 = 99 - a \Rightarrow 0 = 0$$

Thus, any value of $a < 98$ is possible for this equation.

Therefore, $c = 99$, $b = 98$ and $a < 98$

Case - 2 :- $c < b < a$

Now, we need to find the maximum value of b . All, a , b , and c are natural numbers is less than 100, and we $a > b$. Thus, if we assume the value of $a = 99$ and $b = 98$ (which are the two maximum possible values), then -

$|99 - 98| + |98 - c| = |c - 99|$, and we assumed that $c < b$, thus $c < 98$.

$$\Rightarrow 1 + 98 - c = 99 - c \Rightarrow 0 = 0$$

Thus, any value of $c < 98$ is possible for this equation.

Therefore, $a = 99$, $b = 98$ and $c < 98$

Thus, in both cases, the maximum value of $b = 98$.

[▶ VIDEO SOLUTION](#)

4.24

The total number of matches played by all the teams will be $= {}^8C_2 = 28$ matches.

Now, one of the team members has been suspended after playing three matches. If they had not been suspended, they would have played seven games in total. Thus, the four matches played by this team won't be happening in the tournament further.

Thus, if the team is suspended after three matches, the total number of matches will be $= 28 - 4 = 24$ matches.

[▶ VIDEO SOLUTION](#)

5.147

$a_1 = \ln\left(\frac{a}{b}\right)$, $a_2 = \ln\left(\frac{a}{b^{\frac{3}{2}}}\right)$. Thus, the common difference will be $= a_2 - a_1$

$$\Rightarrow d = \ln\left(\frac{a}{b^{\frac{3}{2}}}\right) - \ln\left(\frac{a}{b}\right) = \ln\left(\frac{a \times b}{a \times b^{\frac{3}{2}}}\right) = -\frac{1}{2} \ln(b)$$

The sum of first n terms is given by $= \frac{n}{2} [2a + (n - 1)d]$

Here, $n = 21$; thus, the sum of the first 21 terms $= \frac{21}{2} [2a + 20d] = 21 [a + 10d]$

$$\Rightarrow S_{21} = 21 \left[\ln\left(\frac{a}{b}\right) + 10 \left(-\frac{1}{2}\right) \ln b \right]$$

$$\Rightarrow S_{21} = 21 [\ln a - \ln b - 5 \ln b]$$

$$\Rightarrow S_{21} = 21 [\ln a - 6 \ln b]$$

$$\Rightarrow S_{21} = 21 \ln\left(\frac{a}{b^6}\right)$$

$$\Rightarrow S_{21} = \ln\left(\frac{a^{21}}{b^{126}}\right)$$

It is given that the sum of first 21 terms $= \ln\left(\frac{a^m}{b^n}\right)$, therefore $m = 21$ and $n = 126$.

Thus, $m + n = 21 + 126 = 147$

[▶ VIDEO SOLUTION](#)

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6.40

	NOT AVAILABLE	AVAILABLE		
		PASSED	FAIL	
ENGLISH				120
MATHS				120

The number of students who did not appear for the English exam is twice that of those who did not appear for the Math exam. Let us assume that the number of students who did not appear for Math = X, then the number of students who did not appear for English = 2X

The number of students who passed the Math exam is twice that of those who appeared but failed the English exam. Let us assume the number of students who appeared but failed the English exam is Y, then the number of students who passed the Math exam = 2Y

The number of students who passed the English exam is twice that of those who appeared but failed the Math exam. Let us assume that the number of students who appeared but failed the Math exam = Z, then the number of students who passed the English exam = 2Z.

	NOT AVAILABLE	AVAILABLE		
		PASSED	FAIL	
ENGLISH	2X	2Z	Y	120
MATHS	X	2Y	Z	120

$$2X + 2Z + Y = 120 \rightarrow 1$$

$$X + 2Y + Z = 120 \rightarrow 2$$

Multiply eq. 2 by 2, and subtract eq. 1 from it.

$$\Rightarrow (2X + 4Y + 2Z) - (2X + Y + 2Z) = 240 - 120$$

$$\Rightarrow 3Y = 120$$

$$\Rightarrow Y = 40$$

 VIDEO SOLUTION

7.12

$$A = \begin{bmatrix} 2 & n \\ 4 & 1 \end{bmatrix}$$

$$\Rightarrow A^2 = \begin{bmatrix} 2 & n \\ 4 & 1 \end{bmatrix} \begin{bmatrix} 2 & n \\ 4 & 1 \end{bmatrix}$$

$$\Rightarrow A^2 = \begin{bmatrix} 4 + 4n & 3n \\ 12 & 4n + 1 \end{bmatrix}$$

$$\text{And, } A^3 = \begin{bmatrix} 4 + 4n & 3n \\ 12 & 4n + 1 \end{bmatrix} \begin{bmatrix} 2 & n \\ 4 & 1 \end{bmatrix}$$

$$\Rightarrow A^3 = \begin{bmatrix} 8 + 20n & 4n^2 + 7n \\ 16n + 28 & 16n + 1 \end{bmatrix} \rightarrow 1$$

$$\text{And, it is given that } A^3 = 27 \begin{bmatrix} 4 & q \\ p & r \end{bmatrix}$$

$$\Rightarrow A^3 = \begin{bmatrix} 108 & 27q \\ 27p & 27r \end{bmatrix} \rightarrow 2$$

Comparing each cell value in eq. 1 and eq. 2 -

$$\Rightarrow 8 + 20n = 108 \Rightarrow n = 5$$

$$\Rightarrow 4n^2 + 7n = 27q \Rightarrow 135 = 27q \Rightarrow q = 5$$

$$\Rightarrow 16n + 28 = 27p \Rightarrow 108 = 27p \Rightarrow p = 4$$

$$\Rightarrow 16n + 1 = 27r \Rightarrow 81 = 27r \Rightarrow r = 3$$

Thus, the value of $p + q + r = 4 + 5 + 3 = 12$

 VIDEO SOLUTION

8.2

There are five teams, each with 15 members, for a total of 75 members.

Also, the number of biologists, geologists and explorers is equal, thus this will be equal to 25.

It is given that Teams C and D have 6 biologists each, and Team A has 6 geologists.

	TEAM A	TEAM B	TEAM C	TEAM D	TEAM E	TOTAL
BIOLOGISTS			6	6		25
GEOLOGISTS	6					25
EXPLORERS						25
TOTAL	15	15	15	15	15	75

Now, each team has at least 2 members from each skill set, and the number of explorers in each team is distinct and decreases in the order A, B, C, D, and E. Thus, if we assume there are 2 explorers in team E, then team D, C, B and A will have 3, 4, 5, and 6 explorers respectively. Thus, the total number of explorers will be $(2 + 3 + 4 + 5 + 6 = 20)$, less than 25. Now, if we assume there are 3 explorers in team E, then team D, C, B and A will have 4, 5, 6, and 7 explorers respectively. Thus, the total number of explorers will be $(3 + 4 + 5 + 6 + 7 = 25)$, equal to 25. This is the only case valid; in all the other cases, it will be either more than 25 or less than 25.

	TEAM A	TEAM B	TEAM C	TEAM D	TEAM E	TOTAL
BIOLOGISTS			6	6		25
GEOLOGISTS	6					25
EXPLORERS	7	6	5	4	3	25
TOTAL	15	15	15	15	15	75

In the diagram, we can see that team A has 2 biologists, and teams C and D will have 4 and 5 geologists, respectively.

Now, each team has more biologists than explorers except team A. Thus, the number of biologists in team B will be 7 (If it is 8, then the number of geologists will be 1, which is not possible, because there are 2 members of each kind in each team). Thus, our final table will look like this.

	TEAM A	TEAM B	TEAM C	TEAM D	TEAM E	TOTAL
BIOLOGISTS	2	7	6	6	4	25
GEOLOGISTS	6	2	4	5	8	25
EXPLORERS	7	6	5	4	3	25
TOTAL	15	15	15	15	15	75

Thus, the number of teams having more geologists than biologists is 2 {Team A and Team E}

 VIDEO SOLUTION

9.15

$\log_3(x^2 - 1)$, $\log_3(2x^2 + 1)$ and $\log_3(6x^2 + 3)$ are the first three terms of an arithmetic progression.

$$\Rightarrow \log_3(2x^2 + 1) - \log_3(x^2 - 1) = \log_3(6x^2 + 3) - \log_3(2x^2 + 1)$$

$$\Rightarrow \log_3 \left[\frac{2x^2 + 1}{x^2 - 1} \right] = \log_3 \left[\frac{6x^2 + 3}{2x^2 + 1} \right]$$

$$\Rightarrow \log_3 \left[\frac{2x^2 + 1}{x^2 - 1} \right] = \log_3 3$$

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

$$\Rightarrow 2x^2 + 1 = 3x^2 - 3$$

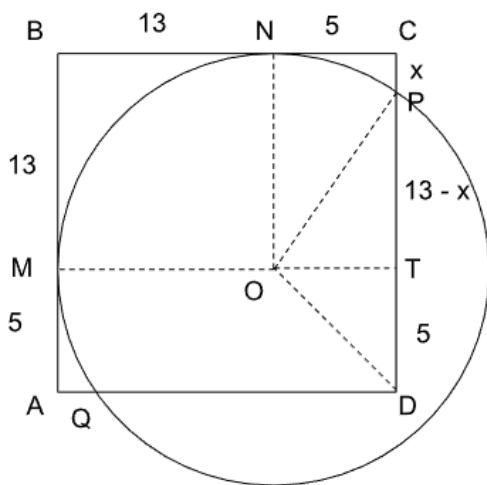
$$\Rightarrow x^2 = 4$$

Thus, the first three terms of the AP will be $\log_3(x^2 - 1) = 1$, $\log_3(2x^2 + 1) = 2$, $\log_3(6x^2 + 3) = 3$.

Therefore, the next three terms of the AP will be 4, 5, and 6, and their sum will be $= 4 + 5 + 6 = 15$.

[▶ VIDEO SOLUTION](#)

10.153



The radius of circle is 13 cm. Thus, $BM = BN = 13$ cm and $MA = DT = CN = OT = 5$ cm.

Let the length of CP be x cm. Since $DT = 5$ cm, thus $PT = (13 - x)$ cm

In triangle OTP, $OT^2 + TP^2 = OP^2$

$$\Rightarrow 5^2 + (13 - x)^2 = 13^2$$

$$\Rightarrow 25 + 169 - 26x + x^2 = 169$$

$$\Rightarrow x^2 - 26x + 25 = 0$$

$\Rightarrow x = 1$ or $x = 25$. But x cannot be 25 cm, because then the length of the side will be negative. Thus, $x = 1$

Thus, $PD = 13 - x + 5 = 17$ cm, and $MT = 18$ cm

Thus, area of triangle PMD $= \frac{1}{2} \times 17 \times 18 = 153 \text{ cm}^2$

[▶ VIDEO SOLUTION](#)



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11.36

Age of Monica = 18

Age of Monica's father = $3 * 18 = 54$

Let us assume that after x years, Monica's age will be half that of her father's age.

$$\Rightarrow 18 + x = \frac{1}{2} (54 + x)$$

$$\Rightarrow 36 + 2x = 54 + x$$

$$\Rightarrow x = 18$$

Thus, after 18 years, Monica's age will be half that of her father's age. At that time, Monica will be $= 18 + 18 = 36$.

 VIDEO SOLUTION

12.6

There are five teams, each with 15 members, for a total of 75 members.

Also, the number of biologists, geologists and explorers is equal, thus this will be equal to 25.

It is given that Teams C and D have 6 biologists each, and Team A has 6 geologists.

	TEAM A	TEAM B	TEAM C	TEAM D	TEAM E	TOTAL
BIOLOGISTS			6	6		25
GEOLOGISTS	6					25
EXPLORERS						25
TOTAL	15	15	15	15	15	75

Now, each team has at least 2 members from each skill set, and the number of explorers in each team is distinct and decreases in the order A, B, C, D, and E. Thus, if we assume there are 2 explorers in team E, then team D, C, B and A will have 3, 4, 5, and 6 explorers respectively. Thus, the total number of explorers will be $(2 + 3 + 4 + 5 + 6 = 20)$, less than 25. Now, if we assume there are 3 explorers in team E, then team D, C, B and A will have 4, 5, 6, and 7 explorers respectively. Thus, the total number of explorers will be $(3 + 4 + 5 + 6 + 7 = 25)$, equal to 25. This is the only case valid; in all the other cases, it will be either more than 25 or less than 25.

	TEAM A	TEAM B	TEAM C	TEAM D	TEAM E	TOTAL
BIOLOGISTS			6	6		25
GEOLOGISTS	6					25
EXPLORERS	7	6	5	4	3	25
TOTAL	15	15	15	15	15	75

In the diagram, we can see that team A has 2 biologists, and teams C and D will have 4 and 5 geologists, respectively.

Now, each team has more biologists than explorers except team A. Thus, the number of biologists in team B will be 7 (If it is 8, then the number of geologists will be 1, which is not possible, because there are 2 members of each kind in each team). Thus, our final table will look like this.

	TEAM A	TEAM B	TEAM C	TEAM D	TEAM E	TOTAL
BIOLOGISTS	2	7	6	6	4	25
GEOLOGISTS	6	2	4	5	8	25
EXPLORERS	7	6	5	4	3	25
TOTAL	15	15	15	15	15	75

Thus, the number of biologists arranged in ascending order in each team is $= (2, 4, 6, 6, 7)$. Thus, the median value is 6.

 VIDEO SOLUTION

13.20

$$7m + 11n = 200$$

It is given that both m and n are positive integers. We need to find one integer pairs of (m,n) that satisfy the equation for these questions.

If we put the value of $n = 1$, then the value of $m = 27$. Thus, one solution will be $(27,1)$.

Now, to find the next solution of n , we need to add the coefficient of m in the original value of n , and to find the next value of m , we need to subtract the coefficient of n in the original value of m . (One should be added, the other should be subtracted. Since we need the positive values of m and n , thus we are adding in n , and subtracting from m). We will continue this process till we get any value of m or n as negative.

Thus, the other solutions of these equations will be - $(m,n) = (16,8), (5,15)$

$$\text{If } (m,n) = (27,1) \Rightarrow m+n = 28.$$

$$\text{If } (m,n) = (16,8) \Rightarrow m+n = 24.$$

$$\text{If } (m,n) = (5,15) \Rightarrow m+n = 20.$$

Thus, the minimum value of $m + n = 20$.

 VIDEO SOLUTION

14.30

If $N = p^a \times q^b \times r^c$, then the number of factors is given by $(a + 1)(b + 1)(c + 1)$

Now, we are given $N = 3^5 \times 5^8 \times 7^2$, and we need to find the factors which are perfect squares.

A number is a perfect square if all exponents in its prime factorization are even. So, we need to find the even exponent possible values for each prime number in N

Exponent of 3 in N is 5, thus, the even values which are possible = 0, 2, 4 {3 possibilities}

Exponent of 5 in N is 8, thus, the even values which are possible = 0, 2, 4, 6, 8 {5 possibilities}

Exponent of 7 in N is 2, thus, the even values which are possible = 0, 2 {2 possibilities}

Thus, the total number of even factors for N will be = $3 \times 5 \times 2 = 30$

 VIDEO SOLUTION

15.11

$$f(x) = ax^2 + bx + 5$$

Polynomial $ax^2 + bx + 5$ leaves a remainder 3 when divided by $x - 1$. Thus, as per the remainder theorem, when $x = 1$, the remainder is 3.

$$f(1) = 3 \Rightarrow a + b + 5 = 3 \Rightarrow a + b = -2 \rightarrow 1$$

Polynomial $ax^2 + bx + 5$ leaves a remainder 2 when divided by $x + 1$. Thus, as per the remainder theorem, when $x = -1$, the remainder is 2.

$$f(-1) = 2 \Rightarrow a - b + 5 = 2 \Rightarrow a - b = -3 \rightarrow 2$$

Adding eq. 1 and eq. 2 -

$$\Rightarrow 2a = -5 \Rightarrow a = -2.5$$

Subtracting eq. 2 from eq. 1 -

$$\Rightarrow 2b = 1 \Rightarrow b = 0.5$$

Therefore the value of $2b - 4a = 2(0.5) - 4(-2.5) = 1 + 10 = 11$

▶ VIDEO SOLUTION



Quantitative Ability MCQ

16. D

Given,

$$1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots = \frac{\pi^2}{6} \text{-----}(1)$$

Multiplying all the terms by $\frac{1}{4}$ we get,

$$\frac{1}{4} + \frac{1}{2^2 \cdot 4} + \frac{1}{3^2 \cdot 4} + \frac{1}{4^2 \cdot 4} + \dots = \frac{\pi^2}{6 \cdot 4} = \frac{\pi^2}{24}$$

$$\text{or, } \frac{1}{2^2} + \frac{1}{2^2 \cdot 2^2} + \frac{1}{3^2 \cdot 2^2} + \frac{1}{4^2 \cdot 2^2} + \dots = \frac{\pi^2}{6 \cdot 4} = \frac{\pi^2}{24}$$

$$\text{or, } \frac{1}{2^2} + \frac{1}{4^2} + \frac{1}{6^2} + \frac{1}{8^2} + \dots = \frac{\pi^2}{6 \cdot 4} = \frac{\pi^2}{24} \text{-----}(2)$$

Subtracting (2) from (1),

$$1 + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2} + \dots = \frac{\pi^2}{6} - \frac{\pi^2}{24} = \frac{3\pi^2}{24} = \frac{\pi^2}{8}$$

▶ VIDEO SOLUTION

17. C

$$y = a + b \log_e x$$

$$\Rightarrow b \log_e x = y - a$$

$$\Rightarrow \log_e x^b = y - a$$

$$\Rightarrow x^b = e^{(y-a)}$$

$$\Rightarrow x^b = \frac{e^y}{e^a}$$

$$\Rightarrow e^y = e^a x^b$$

Thus, we can clearly see that e^y is directly proportional to x^b

▶ VIDEO SOLUTION

18. C

$$x^8 + x^7 + \dots + x + 1 = 0$$

Since $1, x, x^2, x^3, \dots$ are in GP, thus we will apply the formula of sum of GP.

$$\Rightarrow 1 \left[\frac{x^9 - 1}{x - 1} \right] = 0$$

$$\Rightarrow x^9 - 1 = 0$$

$$\Rightarrow x^9 = 1$$

Now, a_1, a_2, \dots, a_8 are the roots of the equation thus -

$$(a_1)^9 = (a_2)^9 = (a_3)^9 = \dots = (a_8)^9 = 1$$

We need to find the value of $a_1^{2025} + a_2^{2025} + \dots + a_8^{2025}$.

$$(a_1^9)^{225} + (a_2^9)^{225} + \dots + (a_8^9)^{225}$$

$$(1)^{225} + (1)^{225} + \dots + (1)^{225} = 1 + 1 + \dots + 1 = 8$$

 VIDEO SOLUTION

19. **B**

Let us assume $a < b < c$

$$\text{Max}(a, b, c) = c$$

$$\text{Min}(a, b, c) = a$$

$$\text{Median}(a, b, c) = b$$

$$\text{Mean}(a, b, c) = (a+b+c)/3$$

$$\text{Now, Max}(a, b, c) + \text{Min}(a, b, c) = 15$$

$$\Rightarrow c + a = 15 \rightarrow 1$$

$$\text{Also, Median}(a, b, c) - \text{Mean}(a, b, c) = 2$$

$$\Rightarrow b - \frac{(a + b + c)}{3} = 2$$

$$\Rightarrow 2b - (a + c) = 6 \rightarrow 2$$

Adding eq. 1 and eq. 2 -

$$\Rightarrow 2b = 21$$

$$\Rightarrow b = 10.5$$

Thus, the median of a, b, and c = b = 10.5

 VIDEO SOLUTION

20. **B**

$$\log_{25} [5 \log_3(1 + \log_3(1 + 2 \log_2 x))] = \frac{1}{2}$$

$$[5 \log_3(1 + \log_3(1 + 2 \log_2 x))] = (25)^{\frac{1}{2}}$$

$$[5 \log_3(1 + \log_3(1 + 2 \log_2 x))] = 5$$

$$\log_3(1 + \log_3(1 + 2 \log_2 x)) = 1$$

$$1 + \log_3(1 + 2 \log_2 x) = 3$$

$$\log_3(1 + 2 \log_2 x) = 2$$

$$(1 + 2 \log_2 x) = 9$$

$$2 \log_2 x = 8$$

$$\log_2 x = 4$$

$$x = 16$$

 VIDEO SOLUTION



21. B

Let us assume the number as xyz

Total outcomes = All the numbers between 100 and 400 for which the sum of digits = 10

Favourable outcomes = All the numbers between 100 and 400 for which the sum of digits = 10, and the number is divisible by 4.

$$P = \frac{\text{Favourable Outcomes}}{\text{Total Outcomes}}$$

Now, for the **total outcomes**, we have 3 cases as per the hundredth place digit.

Case-1: When the hundredth place digit = 1 ($x = 1$)

Since the sum of digits = 10, $(y + z) = 9$. Thus, there are 10 possible pairs for $(y,z) = (0,9), (1,8), (2,7), \dots, (9,0)$
 \Rightarrow 10 possibilities

Case-2: When the hundredth place digit = 2 ($x = 2$)

Since the sum of digits = 10, $(y + z) = 8$. Thus, there are 9 possible pairs for $(y,z) = (0,8), (1,7), (2,6), \dots, (8,0)$
 \Rightarrow 9 possibilities

Case-3: When the hundredth place digit = 3 ($x = 3$)

Since the sum of digits = 10, $(y + z) = 7$. Thus, there are 8 possible pairs for $(y,z) = (0,7), (1,6), (2,5), \dots, (7,0)$
 \Rightarrow 8 possibilities

For 400, the sum of the digits is 4; thus, we don't need to worry about 400.

Thus, the total outcomes = $10 + 9 + 8 = 27$

For the **favourable outcomes**, we need to check whether the number's last two digits are divisible by 4, that is, yz is divisible by 4 or not.

For Case-1 \Rightarrow the only possible values for $yz = 36$ and 72 . Thus, 2 possibilities.

For Case-2 \Rightarrow the only possible values for $yz = 08, 44$, and 80 . Thus, 3 possibilities.

For Case-3 \Rightarrow the only possible values for $yz = 16$ and 52 . Thus, 2 possibilities.

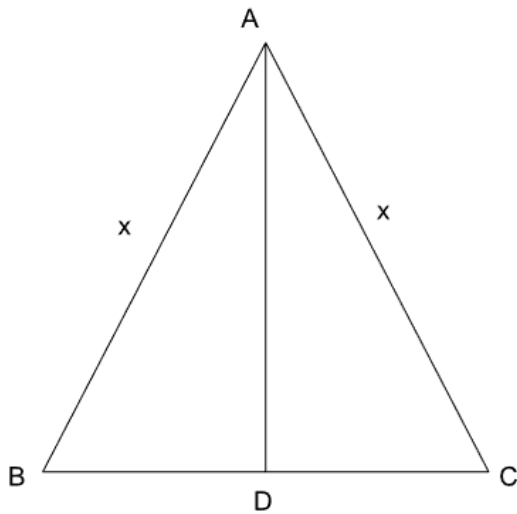
So, number of favourable outcomes = $2 + 3 + 2 = 7$

$$\Rightarrow P = \frac{\text{Favourable Outcomes}}{\text{Total Outcomes}} = \frac{7}{27}$$

[VIDEO SOLUTION](#)

22. D

In triangle ABC, $AB = AC = x$, therefore $\angle ABC = \angle ACB = \theta$, since angles opposite to equal sides are equal. Let AD be the perpendicular to BC.



$$\cos \theta = \frac{\text{base}}{\text{hypotenuse}} = \frac{BD}{AB} = \frac{BD}{x} \Rightarrow BD = x \cos \theta$$

$$\cos \theta = \frac{\text{base}}{\text{hypotenuse}} = \frac{CD}{AB} = \frac{CD}{x} \Rightarrow CD = x \cos \theta$$

$$\Rightarrow BC = BD + DC = 2x \cos \theta$$

$$\sin \theta = \frac{\text{perpendicular}}{\text{hypotenuse}} = \frac{AD}{AB} = \frac{AD}{x} \Rightarrow AD = x \sin \theta$$

It is given that the circumradius of the triangle is y .

We also know that $\Rightarrow \text{Area of } \triangle = \frac{abc}{4R}$, where R is the circumradius, and $a, b,$ and c are the sides of the triangle.

$$\Rightarrow \frac{1}{2} \times 2x \cos \theta \times x \sin \theta = \frac{x \times x \times 2x \cos \theta}{4y}$$

$$\Rightarrow \frac{1}{2} \times 2x^2 \cos \theta \sin \theta = \frac{2x^3 \cos \theta}{4y}$$

$$\Rightarrow \frac{1}{2} \times \sin \theta = \frac{x}{4y}$$

$$\Rightarrow \frac{x}{y} = 2 \sin \theta$$

[VIDEO SOLUTION](#)

23. C

$8x^2 - 2kx + k = 0$. Let us assume the two roots are a and ap

$$\text{Now, } a + ap = \frac{2kx}{8} \Rightarrow a(1+p) = \frac{kx}{4} \Rightarrow a = \frac{kx}{4(1+p)} \rightarrow 1$$

$$\text{And, } a^2p = \frac{k}{8}$$

Substituting the value of a from eq. 1 -

$$\Rightarrow p \left[\frac{k}{4(1+p)} \right]^2 = \frac{k}{8}$$

$$\Rightarrow p \times \frac{k^2}{16(1+p)^2} = \frac{k}{8}$$

$$\Rightarrow k = \frac{2(1+p)^2}{p}$$

$$\Rightarrow k = 2 \left[\frac{1+p}{\sqrt{p}} \right]^2$$

$$\Rightarrow k = 2 \left[\sqrt{p} + \frac{1}{\sqrt{p}} \right]^2$$

▶ VIDEO SOLUTION

24. C

Slope of line AB = $m_{AB} = \frac{1-3}{5-1} = -\frac{2}{4} = -\frac{1}{2}$. And, the slope of the other line is m . The angle between the two lines is 45 degrees, and we know the formula -

$$\tan \theta = \left| \frac{m_2 - m_1}{1 + m_1 m_2} \right|$$

$$\tan(45) = \left| \frac{m - \left(-\frac{1}{2}\right)}{1 + m \left(-\frac{1}{2}\right)} \right|$$

$$1 = \left| \frac{2m + 1}{2 - m} \right|$$

$$|2m + 1| = |m - 2|$$

There are two possible cases for this.

$$\text{Case-1: } 2m + 1 = m - 2 \Rightarrow m = -3$$

$$\text{Case-2: } 2m + 1 = -m + 2 \Rightarrow 3m = 1 \Rightarrow m = \frac{1}{3}$$

Thus, the two possible values for $m = -3$ and $m = 1/3$.

▶ VIDEO SOLUTION

25. C

Let $P(x) = ax^2 + bx + c$, and it is given that $P(0) = 2$.

$$\Rightarrow a(0) + b(0) + c = 2 \Rightarrow c = 2$$

$$\begin{vmatrix} P(0) & P(1) \\ P(0) & P(2) \end{vmatrix} = 0$$

$$\Rightarrow P(0)P(2) - P(0)P(1) = 0$$

$$\Rightarrow P(1) = P(2)$$

$$\Rightarrow a + b + 2 = 4a + 2b + 2$$

$$\Rightarrow b = -3a$$

It is also given that -

$$P(1) + P(2) + P(3) = 14$$

$$a + b + 2 + 4a + 2b + 2 + 9a + 3b + 2 = 14$$

$$14a + 6b = 8 \quad (\text{Substituting the value of } b = -3a)$$

$$14a - 18a = 8 \Rightarrow a = -2$$

$$\text{Thus, } b = -3(-2) = 6$$

$$\text{Therefore, } P(x) = -2x^2 + 6x + 2$$

$$\Rightarrow P(4) = -2 * 4^2 + 6 * 4 + 2$$

$$\Rightarrow P(4) = -32 + 24 + 2$$

$$\Rightarrow P(4) = -6$$

[VIDEO SOLUTION](#)



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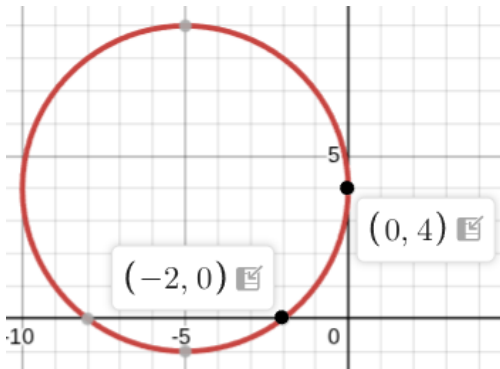
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26. B

A circle touches the y-axis at (0, 4). Therefore, the centre of the circle is on the horizontal line whose y coordinate = 4. Thus, the coordinates of the center of the circle will be (a,4).

Now, the circle also passes through the point (-2,0)



The radius of the circle remains constant.

$$(a - 0)^2 + (4 - 4)^2 = (a - (-2))^2 + (4 - 0)^2$$

$$a^2 = a^2 + 4a + 4 + 16$$

$$\Rightarrow a = -5$$

Therefore, the radius of the circle = $\sqrt{(4 - 4)^2 + (0 - (-5))^2} = 5 \text{ cm}$

[VIDEO SOLUTION](#)

27. B

When the dog runs along the sides of the triangle, its path is parallel to each side. The total length of these straight sections is simply the perimeter of the triangle.

Hence, the perimeter of the triangle = 19 m

Now, at each of the three corners (vertices) of the triangle, the dog's path forms a circular arc to maintain its 1-meter distance.

So, we can say the radius of each arc is the dog's distance from the triangle, which is 1 meter.

Therefore, the three curved arcs at the corners will make one complete circle with a radius of 1 meter.

So, the total length of this curved path is the circumference of that circle: $2 \times \pi \times 1 = 2\pi \text{ m}$

Total Distance = Straight Path + Curved Path = $19 + 2\pi$ meters

[VIDEO SOLUTION](#)

28. B

The amount invested in Scheme A is 30,000. Let the amount invested in scheme B be X, and the amount invested in scheme C be 70000 - X. The interest rates in scheme A, scheme B, and scheme C are 10%, 8%, and 12%, compounded annually.

Now, since in the first year, the amount of simple interest is the same as the amount of compound interest, we will use the formulas of simple interest for the first year for calculations.

It is given that the total interest earned from all three schemes during the first year is 10600.

$$\Rightarrow \frac{30000 \times 10 \times 1}{100} + \frac{X \times 8 \times 1}{100} + \frac{(70000 - X) \times 12 \times 1}{100} = 10600$$

$$\Rightarrow 3000 + \frac{8X}{100} + 8400 - \frac{12X}{100} = 10600$$

$$\Rightarrow \frac{4X}{100} = 800$$

$$\Rightarrow X = 20000$$

Thus, the amount invested in scheme B is 20,000, and the amount invested in scheme C is 50,000.

The total amount at the end of 2 years will be = $30000 (1.1)^2 + 20000 (1.08)^2 + 50000 (1.12)^2$

The total amount at the end of 2 years will be = $36300 + 23328 + 62720 = 122348$

Thus, the interest earned in the 2 years will be = $122348 - 100000 = 22348$

Now, the interest earned in the first year was 10600. Thus, the interest earned in the second year will be equal to the total interest earned over the two years minus the interest earned in the first year.

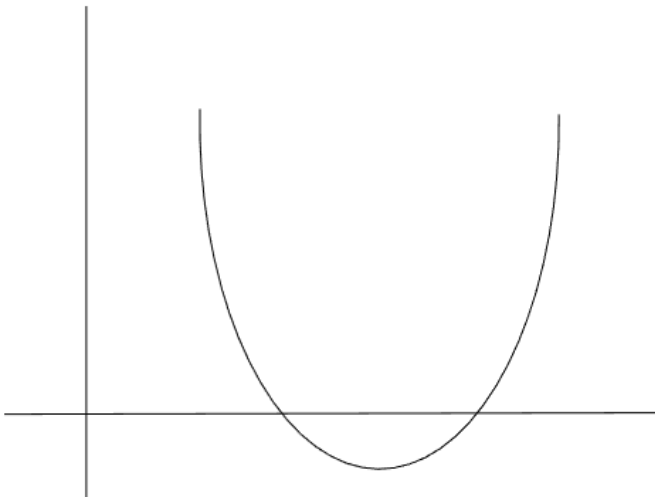
Thus, the interest earned in the second year will be = $22348 - 10600 = 11748$ Rupees.

[▶ VIDEO SOLUTION](#)

29. B

$$f(x) = a^2x^2 + 2bx + c$$

a^2 is a positive number. This means the coefficient of x^2 is a positive number. Whenever the coefficient of x^2 is positive, the graph will look something like this -



Thus, we can see that this graph will have a definite minimum, but no definite maximum value.

[▶ VIDEO SOLUTION](#)

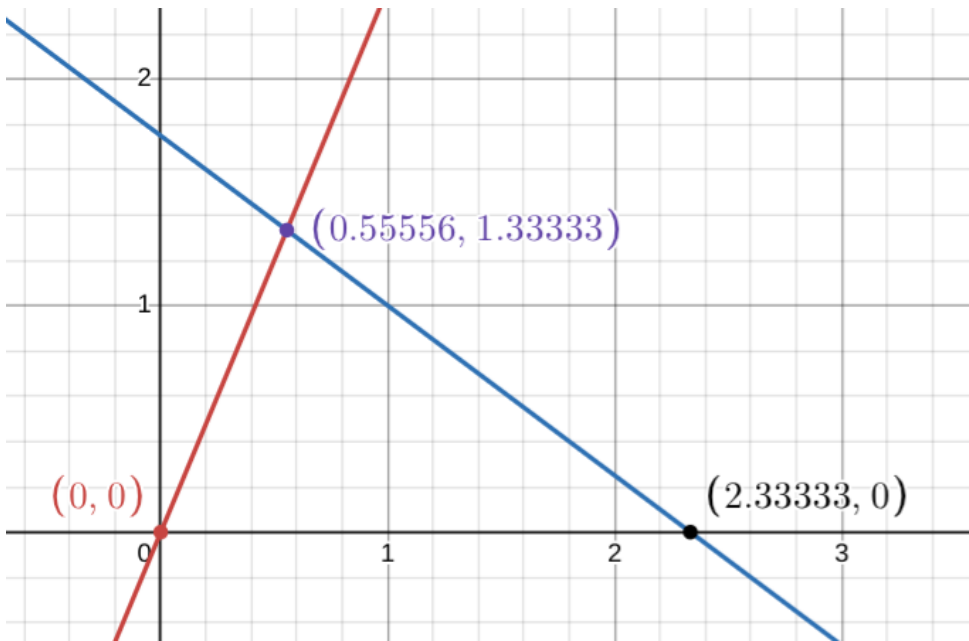
30. B

We are given 3 lines : $y = 0$, $12x - 5y = 0$, and $3x + 4y = 7$. The triangle formed by these three lines will have its vertices at the points of intersection of the lines with each other. These points can be found by solving the equations simultaneously.

The lines $y=0$ and $12x-5y=0$ intersect at $x=0$ ie $(0,0)$

The lines $y=0$ and $3x+4y=0$ intersect at $x = \frac{7}{3}$ ie $(\frac{7}{3}, 0)$

And the intersection point of the lines $12x-5y=0$ and $3x+4y=0$ is found to be $(\frac{5}{9}, \frac{4}{3})$



So the area of the triangle formed by these 3 vertices is given by the formula $\Delta = \frac{1}{2} |x_1 (y_2 - y_3) + x_2 (y_3 - y_1) + x_3 (y_1 - y_2)|$

Taking $(0,0)$, $(\frac{7}{3}, 0)$, and $(\frac{5}{9}, \frac{4}{3})$ as (x_1, y_1) , (x_2, y_2) and (x_3, y_3) we have ,

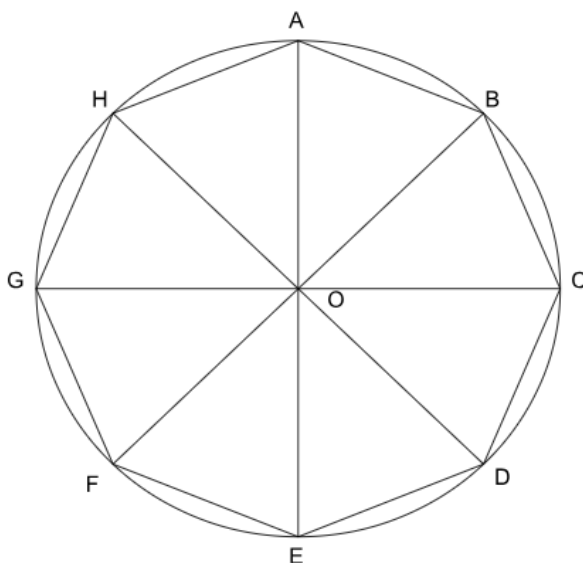
$$\Delta = \frac{1}{2} |0 (0 - \frac{4}{3}) + \frac{7}{3} (\frac{4}{3} - 0) + \frac{5}{9} (0 - 0)|$$

$$\text{or, } \Delta = \frac{1}{2} |0 + \frac{28}{9} + 0| = \frac{14}{9} \text{ sq units.}$$

[▶ VIDEO SOLUTION](#)

31. A

The figure below represents a regular octagon ABCDEFGH inscribed in a circle with center at O and radius 1 unit.



Since the octagon is a regular octagon, on drawing diagonals AE, BF, CG, and DH, all of them will pass through the center. We can therefore divide the octagon into 8 congruent isosceles triangles.

Hence, $OA=OB=OC=OD=OE=OF=OG=OH=1$ unit (since all of them are radii of the same circle)

And, $AB=BC=CD=DE=EF=FG=GH=HA$ (since all of them are sides of the same regular octagon)

So we can say that $\triangle AOB, \triangle BOC, \triangle COD, \triangle DOE, \triangle EOF, \triangle FOG, \triangle GOH$ and $\triangle HOA$ are all congruent triangles, which would mean that all the angles at the center are also equal.

$$\text{So, } \angle AOB = \frac{360}{8} = 45^\circ$$

$$\text{Hence, area of } \triangle AOB = \frac{1}{2} \times AO \times BO \times \sin (\angle AOB) = \frac{1}{2} \times 1 \times 1 \times \sin 45 = \frac{1}{2\sqrt{2}} \text{ sq units}$$

As the octagon is divided into 8 congruent triangles, so the area of the octagon is $\frac{1}{2\sqrt{2}} \times 8 = 2\sqrt{2}$ sq units

 VIDEO SOLUTION

32. A

Consider the speeds of Ankit and Bipul as A and B respectively. The total distance of the swimming pool is covered by Ankit in 10 minutes and by Bipul in 15 minutes. This gives us the following relation:

$10A = 15B$ or $A : B = 3 : 2$. We can therefore assume the value of A as $3k$ and the value of B as $2k$. This makes the total length of the swimming pool $3k * 10 = 2k * 15 = 30k$

Since they are running in the same direction, the first meeting will be at $\frac{30k}{3k + 2k} = 6$ minutes. $80 - 6 = 74$ minutes of their journey is still remaining.

Since they are swimming back and forth, the entire back and forth journey can be taken as a circular track the length of which is double the length of the swimming pool, or $30k + 30k = 60k$.

On this circular journey, Ankit and Bipul will meet every $\frac{60k}{3k + 2k} = 12$ minutes. In remaining 74 minutes of journey, therefore, they will meet a total of $\lfloor \frac{74}{12} \rfloor = 6$ times.

Along with the first meeting after 6 minutes, there will thus be a total of $6 + 1 = 7$ meetings in total in a span of 80 minutes.

 VIDEO SOLUTION

33. B

Sum of first n terms of a G.P. is given by the formula, $S = \frac{a \cdot (r^n - 1)}{r - 1}$ where a is the first term and r is the common ratio.

So according to question,

$$\frac{a \cdot (r^5 - 1)}{r - 1} = a \cdot \frac{(r^7 - 1)}{r - 1}$$

$$\text{or, } r^5 = r^7$$

$$\text{or, } r^5(1 - r^2) = 0$$

$$\text{or, } r = 0, 1, -1$$

But r can't be 1 as then sum of terms will be not defined (in denominator $r - 1$ is there so for $r = 1$, sum will be not defined)

Also, r can't be 0 as then all the other terms except the first term will be zero.

$$\text{So, } r = -1$$

Now, sum of first 9 terms=24

$$\text{or, } \frac{a \cdot (r^9 - 1)}{r - 1} = \frac{a(-1 - 1)}{(-1 - 1)} = 24$$

$$\text{or, } a = 24$$

$$\text{So, fourth term} = a \cdot r^{4-1} = a \cdot r^3 = 24(-1)^3 = -24$$

 VIDEO SOLUTION

34. D

$$\text{Given, } \log \left(x + \frac{1}{x} \right) \left[\log_2 \left(\frac{x-1}{x+2} \right) \right] > 0$$

The first constraint for this inequality is:

$$\text{i.) } x + \frac{1}{x} > 0$$

$$\text{or, } \frac{x^2 + 1}{x} > 0$$

Now, $x^2 + 1$ is always positive

So, for $\frac{x^2 + 1}{x}$ to be positive, x has to be positive i.e. $x > 0 \rightarrow (1)$

$$\text{ii.) } \log_2 \left(\frac{x-1}{x+2} \right) > 1$$

$$\text{or, } \frac{x-1}{x+2} > 2^1$$

$$\text{or, } \frac{x-1}{x+2} - 2 > 0$$

$$\text{or, } \frac{x-1-2x-4}{x+2} > 0$$

$$\text{or, } \frac{-x-5}{x+2} > 0$$

$$\text{or, } (x+5)(x+2) < 0$$

$$\text{or, } -5 < x < -2 \rightarrow (2)$$

(1) and (2) are contradictory to each other

So, there is no value of x possible satisfying this inequality

So, solution set is null set

 VIDEO SOLUTION

35. B

Since a_k is the k^{th} term of S_1

$$\text{So, } a_k = 100 + 5(k-1) = 95 + 5k$$

$$\text{Similarly, } b_k = 100 - 5(k-1) = 105 - 5k$$

$$\text{So, } \sum_{k=1}^{20} a_k b_k = \sum_{k=1}^{20} (105 - 5k)(95 + 5k)$$

$$= 5 \times 5 \sum_{k=1}^{20} (21 - k)(19 + k)$$

$$= 25 \sum_{k=1}^{20} (399 + 21k - 19k - k^2)$$

$$=25 \left(\sum_{k=1}^{20} (399 + 2k - k^2) \right)$$

$$=25 \left(\sum_{k=1}^{20} 399 + 2 \sum_{k=1}^{20} k - \sum_{k=1}^{20} k^2 \right)$$

Now, we know $\sum_{k=1}^n k = \frac{n(n+1)}{2}$ and $\sum_{k=1}^n k^2 = \frac{n(n+1)(2n+1)}{6}$ and here $n = 20$

$$=25 \left(399 \times 20 + 2 \times 20 \times \frac{21}{2} - 20 \times 21 \times \frac{41}{6} \right)$$

$$=25 (399 \times 20 + 420 - 2870)$$

$$=25 \times 5530$$

$$=138250$$

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36. B

According to question, probability of A hitting the target= $P(A) = 0.4$

probability of B hitting the target= $P(B) = 0.6$

So, probability of A missing the target= $P(A^c) = 0.6$

probability of B missing the target= $P(B^c) = 0.4$

Let, E denote the event of A hitting the target first.

The event E can occur in the following ways:

i.) A hits the target in the first shot

ii.) A and B both miss the target in first shot and after that A hits in the second shot

iii.) A and B both miss the target in first and second shot and after that A hits in the third shot and so on....

So basically, $P(E) = P(A) + P(A^c \cap B^c \cap A) + P(A^c \cap B^c \cap A^c \cap B^c \cap A) + \dots$

or, $P(E) = P(A) + P(A^c) \cdot P(B^c) \cdot P(A) + P(A^c) \cdot P(B^c) \cdot P(A^c) \cdot P(B^c) \cdot P(A) + \dots$

or, $P(E) = 0.4 + 0.6 \times 0.4 \times 0.4 + 0.6 \times 0.4 \times 0.6 \times 0.4 \times 0.4 + \dots$

or, $P(E) = 0.4 (1 + 0.6 \times 0.4 + 0.6 \times 0.4 \times 0.6 \times 0.4 + \dots)$

or, $P(E) = 0.4 (1 + 0.24 + 0.24^2 + \dots)$

Now, the term in bracket is an infinite G.P. series with common ratio 0.24

$$\text{or, } P(E) = \frac{0.4}{1 - 0.24} = \frac{0.4}{0.76} = \frac{40}{76} = \frac{10}{19}$$

[VIDEO SOLUTION](#)

37. D

The given expression, $3^{10} + 2$, when cubed, gives us $(3^{10} + 2)^3 = 3^{30} + 8 + (6 \times 3^{20}) + (12 \times 3^{10})$

This expansion can be rewritten as $\underline{(3^{10} + 2)^3} = (3^{30} + 8) + \underline{(6 \times 3^{10})(3^{10} + 2)}$

Since the two underlined parts are both divisible by $(3^{10} + 2)$, we can conclude that the remaining non-

underlined part, $(3^{30} + 8)$ should also be divisible by $(3^{10} + 2)$. Therefore option D, is correct. We can do the same for other options.

We can try $(3^{10} + 2)^2$ to verify option A, the expansion will be $(3^{20} + 4 + 4 * 3^{10})$. Thus, after dividing this by $(3^{10} + 2)$ the remainder will clearly be $4 * 3^{10}$, since this is definitely not divisible by $(3^{10} + 2)$, as 3^{10} is not divisible by $(3^{10} + 2)$, which is an odd number, we can conclude option A is incorrect.

Option B is also incorrect because if $3^{30} + 8$ is divisible after the cubic expansion, a number 6 less than it cannot be.

Finally, if we assume option C to be divisible, then the difference between option C and option D should also be divisible by $(3^{10} + 2)$, this difference is nothing but $(3^{30} - 3^{20}) = 3^{20}(3^{10} - 1)$, since none of the two parts in this difference are divisible, the difference itself is not divisible, and option C will not be divisible either.

Alternate Explanation:

Let $3^{10} = a$ and $2 = b$

Then the given expression is of form $a + b$

So, option A is of form $a^2 + b^2$

option B is of form $a^3 + b$

option C is of form $a^2 + b^3$

option D is of form $a^3 + b^3$

Among all these polynomials, we know only $a^3 + b^3$ has a factor $a + b$

So, option D is the correct answer.

 VIDEO SOLUTION

38. A

Given, $n(A - B), n(A \cap B), n(B - A)$ are in A.P.

Now, $n(A - B) = n(A) - n(A \cap B)$

$n(B - A) = n(B) - n(A \cap B)$

Now, adding these two equations, $n(A - B) + n(B - A) = n(A) + n(B) - 2 \cdot n(A \cap B) \rightarrow (1)$

Since, $n(A - B), n(A \cap B), n(B - A)$ are in A.P.

So, $n(A - B) + n(B - A) = 2 \cdot n(A \cap B) \rightarrow (2)$

From (1) and (2), $n(A) + n(B) - 2 \cdot n(A \cap B) = 2 \cdot n(A \cap B)$

So, $n(A) + n(B) = 4 \cdot n(A \cap B) \rightarrow (3)$

Now we know, $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

or, $18 = 4n(A \cap B) - n(A \cap B) = 3 \cdot n(A \cap B)$ (From (3))

So, $n(A \cap B) = \frac{18}{3} = 6$

From (3), $n(A) + n(B) = 4 \times 6 = 24$

 VIDEO SOLUTION

39. A

We are being given with six digits- 1,3,5,7,8,9

So for a number formed by these digits to be greater than 5000, the number can be either 4-digit, 5-digit or 6-digit

i.) 4-digit number:

Since the number is divisible by 5, so last digit has to be 5

Also, the number is greater than 5000 so first digit has to be 7, 8 or 9

So, the first digit can be selected in 3C_1 ways

For the remaining 2-places, we can select 2 digits from the remaining 4 digits in 4C_2 ways and arrange them in $2!$ ways

So, number of ways of forming the 4-digit number = ${}^3C_1 \times {}^4C_2 \times 2! = 36$ ways

ii.) 5-digit number:

The last digit has to be 5 as the number is divisible by 5

Now, for the remaining 4 places we have to select 4 digits from 5 digits which can be done in 5C_4 ways and rearrange them in $4!$ ways

So, number of ways of forming the 5-digit number = ${}^5C_4 \times 4! = 120$ ways

iii.) 6-digit number:

The last digit has to be 5 as the number is divisible by 5

So, the remaining 5 places can be filled by remaining 5 digits in $5! = 120$ ways

So, number of ways of forming the 6-digit number = $5! = 120$ ways

So, number of integers = $36 + 120 + 120 = 276$

[VIDEO SOLUTION](#)

40. B

11 when divided by 9 remainder is 2

1011 when divided by 9 remainder is 3

Now, $11 \equiv 2 \pmod{9}$

so, $11^{1011} \equiv 2^{1011} \pmod{9} \rightarrow (1)$

Now $2^{1011} = (2^3)^{337} = 8^{337}$

Also, $8 \equiv -1 \pmod{9}$

So, $8^{337} \equiv -1 \pmod{9}$

So, we can say $2^{1011} \equiv 8^{337} \pmod{9} \equiv -1 \pmod{9}$

So, $11^{1011} \equiv -1 \pmod{9}$ (From (1))

Now, -1 is a negative remainder, so positive remainder will be 8 $\rightarrow (2)$

Similarly, $1011 \equiv 3 \pmod{9}$

So, $1011^{11} \equiv 3^{11} \pmod{9}$

Now, $3^{11} = 3^2 \cdot 3^9 = 9 \cdot 3^9$, so it is definitely divisible by 9

So, in this part remainder will be 0 $\rightarrow (3)$

From (2) and (3) we can say, remainder = $8 + 0 = 8$

[VIDEO SOLUTION](#)



41. D

Let's analyse the percentage monthly decline in sales for the months provided in the options compared to the previous month.

1. June

The Apparel sales in June were 230 lakhs of rupees, down from 249 lakhs in May. The percentage decrease was $\frac{249 - 230}{249} \times 100 = 7.63\%$

2. March

The Apparel sales in March were 236 lakhs of rupees, down from 279 lakhs in February. The percentage decrease was $\frac{279 - 236}{279} \times 100 = 15.41\%$

3. December

The Apparel sales in December were 221 lakhs of rupees, down from 228 lakhs in November. The percentage decrease was $\frac{228 - 221}{228} \times 100 = 3.07\%$

4. October

The Apparel sales in October were 222 lakhs of rupees, down from 288 lakhs in September. The percentage decrease was $\frac{288 - 222}{288} \times 100 = 22.91\%$

Based on the calculations above, it's clear that the greatest percentage decline in a month from the options compared to the previous month should be for October. The correct answer is option D.

[▶ VIDEO SOLUTION](#)

42. C

Based on the question, we essentially need to find a sequence of at least three consecutive increasing percentage values of product return as a percentage of sales.

1. For the Apparel category, in January, February, and March, we have 13%, 16% and 20%, which are increasing values.
2. For the Footwear category, in October, November, and December, we have 8%, 9%, and 10%, which are increasing values.
3. For the Electronics category, no three months show a consistently increasing percentage value of product returns out of total sales.

The correct answer is therefore option C; both the Apparel and Footwear categories showed a consecutive increase in the percentage of monthly product returns for three months.

[▶ VIDEO SOLUTION](#)

43. A

In the Footwear category in June, 5% was the rate of product return, this means that the rest 95% were the net sales. The total Footwear sales were 111 and hence the net sales will be $\frac{95}{100} \times 111 = 105.45$ lakhs.

Similarly, for May, the Footwear category total sales were 69, out of which 6% were returned and thus 94%

comprised of net sales. The total net Footwear sales in May were $\frac{94}{100} \times 69 = 64.86$ lakhs.

Therefore, the percentage increase in Footwear net sales from May to June can be calculated to be $\frac{105.45 - 64.86}{64.86} \times 100 = 62.58\%$. The correct answer is option A.

[VIDEO SOLUTION](#)

44. B

In January, the contribution of the Apparel category = $\frac{262}{262 + 104 + 289} = \frac{262}{655} = 40\%$

In April, the contribution of the Apparel category = $\frac{258}{258 + 58 + 325} = \frac{258}{641} = 40.25\%$

In December, the contribution of the Apparel category = $\frac{221}{221 + 86 + 268} = \frac{221}{575} = 38.43\%$

In August, the contribution of the Apparel category = $\frac{252}{252 + 60 + 336} = \frac{252}{648} = 38.89\%$

So, for April the contribution is highest.

[VIDEO SOLUTION](#)

45. B

For September, the value of footwear returned = $\frac{9}{100} \times 118$ (lakhs of rupees)

For July, the value of footwear returned = $\frac{9}{100} \times 119$ (lakhs of rupees)

For June, the value of footwear returned = $\frac{5}{100} \times 111$ (lakhs of rupees)

For March, the value of footwear returned = $\frac{7}{100} \times 121$ (lakhs of rupees)

Clearly the biggest number is $9 \times 119 = 1071$ out of all of these

So, option (b) July is the correct answer.

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Verbal Ability

46. D

We can infer from the sentence "Meta's algorithm will now play up politics because it is the flavour of the season" that the kind of content moderation preferred by people depends on the period or the season, and option A cannot be inferred. While the author mentions fact-checking, he does not claim that the failure to do so is social media's innate strength; therefore, option B is incorrect. Option C is contrary to what the author says in the passage, "unfiltered content can push users away from social media", and is also incorrect. The author continues by saying that "Its move away from content moderation is driven by the need to be more inclusive, yet unfiltered content can push users away from social media towards legacy forms that have better moderation systems in place", from which we can infer option D, which is the correct answer.

47. B

From the section "Social media now has enough control over all other forms of media to broaden its reach. It is the connective tissue for mass consumption of entertainment," we can infer that option B is true, and is likely the correct answer. Option A is incorrect since the author discusses throughout the passage how current debates on content moderation can influence the social media ecosystem. Option D is also incorrect, as the author has not mentioned that social media is incapable of adapting ('cannot adapt') to new policies. Option C mentions that social media can publish any material, which is itself discussed in the context of content moderation, and also states that it 'flourishes' due to this, which is incorrect, as the author underlines the struggles social media faces.

48. **D**

The author says: "Having Washington lean on foreign governments over content moderation does not benefit free speech. Yet, that is the nature of the social media beast, designed to amplify bias," and also that "Meta's algorithm will now play up politics because it is the flavour of the season." From these sections, we can infer that the information available on social media does not necessarily relate to the individual right to free speech or the global concerns surrounding free speech. The author also argues in favour of regulation, and option A is incorrect. Option D is the only reasonable choice available.

49. **D**

The passage makes it clear that social media is the connective tissue of mass consumption of entertainment, and technologies are shaping up to drive their advantage further. From this, we can infer that option A is incorrect. Option B implies that social media has succeeded in finding alternative means of fact-checking, which is contradicted by "social media does not have solutions to either." Option C is also incorrect because it states that other platforms are reworking their engagement with social media. Yet, the aspect of social media's independence from them has not been addressed. Option D is likely the correct answer as the author writes, "Information and misinformation continue to jostle on social media at the mercy of user discretion. Social media now has enough control over all other forms of media to broaden its reach."

50. **A**

The passage reads, "Technologies are shaping up to drive this advantage further through synthetic content targeted precisely at its intended audience." Only option A can be inferred from this section. To push the content further through precision targeting resonates with enlarging the sphere of influence. All other options, are irrelevant to this point.



51. **C**

In the first paragraph, the author writes, "Yet, that is the nature of the social media beast, designed to amplify bias." From this, we can infer that the author considers the inherent nature of social media to amplify bias its biggest negative. This argument about 'bias' is best expressed in option C, 'prejudice' is spread by social media due to its inherent nature.

52. **B**

The author writes: "However, consumption does not usually lead to happiness. While consumers should ideally be blaming their heightened expectations for their lack of happiness, they blame the commodity instead.

They feel that they should have waited for the next version of a mobile phone or automobile before buying the one they did. The version they bought is somehow inferior and therefore cannot make them happy. Baudrillard argues that consumers have replaced 'real' happiness with 'signs' of happiness. This results in the endless deferment of the arrival of total happiness."

From this we can infer that the consumer is usually confused with the commodities (or the signs of happiness) being the same as real happiness. If a person is to realise this distinction, he will come to understand how can consumption be made more satisfying. This is captured in option B, therefore, it is the correct answer.

53. **A**

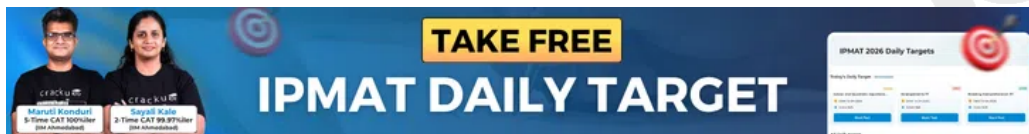
From "Baudrillard argues that consumers have replaced 'real' happiness with 'signs' of happiness," we can infer option A to be true. Option B is way too narrow in the context of the arguments presented in the passage. Option C borrow the word 'magical' from what the Melanesian people considered planes to be as adjectives to describe production and consumption, and is incorrect. Option D is not talked about in the passage and can also be eliminated.

54. **B**

Baudrillard discusses the cargo myth of the Melanesian people because he believes it is "an important analogy for the ways in which consumers engage with objects of consumption." Option B captures this and is the correct answer. Options A, C, and D, are not said to be the reasons why Baudrillard uses this analogy and are all not the correct answer.

55. **A**

The author says that the consumers view commodities as signs of happiness and buy them for this very reason, he mentions that ".. as a result, commodities appear to be distanced from the social processes which lead to their production. In effect, objects of consumption are divorced from the reality which produces them." Option B is narrow and can be eliminated. Option C is not discussed in the passage and can also be eliminated. Option D is a distortion to the 'real vs signs of happiness' aspect of commodities. Option A is the only option which captures the arguments made in the passage, and is, therefore, the correct answer.



56. **A**

The passage clarifies that "Baudrillard argues that consumers have replaced 'real' happiness with 'signs' of happiness. This results in the endless deferment of the arrival of total happiness." We can thus infer that, according to Baudrillard, at least when it comes to consumption, happiness is perpetually delayed. Option A is likely the correct answer. Option B emphasises on patience and waiting, which have not been discussed in the passage. Option C implies that happiness prioritises product overconsumption, which is not true as it's the want of happiness that might lead to overconsumption, happiness itself is free from 'signs' of happiness. Option D has also not been discussed in the passage.

57. **D**

Baudrillard argues that consumption can never cause happiness. He puts forward arguments that support his proposition. For him, therefore, consumption is not a reasonable process as it inhibits the pursuit of happiness. Therefore, option D, 'consumption is an irrational process' is the likely answer.

58. **C**

The phrases given in the options have the following meanings them:

1. put him down: the phrase simply means to put someone down
2. put him aside: it might imply ignoring, but it does not have an indirect meaning usually
3. put up with him: the phrase means to tolerate someone (or their actions, despite them being bad)
4. put along with him: although it might not have a meaning in particular, it can be close to the meaning of 'go along with'

In the given sentence, Deepak is described as an unpleasant person. It makes sense that people are tolerating him because they have a friend who is a close relative of his; therefore, option C is the correct answer.

59. **A**

"Usher in" means to mark the beginning of something; it fits perfectly in this context, as the people are hoping that the new government will bring economic growth; "set in" is also used to mark beginnings, but it is primarily used in a negative context, which is not the tone here. Hence, usher in is a better choice here.

"Turn up" means to increase, and "set forth " means to present ideas, neither of which aligns with the semantic demands of the context.

Hence, the correct option here is (A) usher in

60. **C**

When the woman inherited jewellery from a distant relative, she didn't know its value and needed to take action to determine its worth. The correct phrase to complete the sentence is "to have it appraised" (Option C) because this specifically means getting a professional valuation of the jewellery's monetary worth. This is exactly what someone would do when they inherit valuable items and need to understand their financial value.

The other options don't fit the context correctly. "To get an approval" (Option A) would mean seeking permission rather than determining value. "To get it appreciated" (Option B) suggests making the jewellery more valued emotionally, not assessing its price. "To have it apprised" (Option D) is incorrect because "apprise" means to inform someone about something, which has nothing to do with valuation. Only "appraised" correctly describes the process of professionally evaluating the jewellery's worth.

Option C is the correct choice here.



61. **D**

The sentence talks about the frequent and almost oblivious behaviour of deer on or near roads, and how they seem unaffected by cars or danger—the blank calls for a phrase that continues this idea of natural, perhaps sudden or carefree movement.

The best answer is "bounding across the road" (Option D) because "bounding" accurately captures the leaping, energetic motion typical of deer. "Bounding across the road" is a natural continuation of actions like crossing or standing in the road.

The other options do not fit either contextually or grammatically. "Jumping under the road" (Option A) is physically illogical and awkward. "Foraging beneath the road" (Option B) is biologically implausible and disrupts the flow. "Staggering with the road" (Option C) is unclear and doesn't convey natural animal behaviour. Only "bounding across the road" aligns with how deer move and completes the sentence logically and vividly.

Option D is the best choice.

 VIDEO SOLUTION

62. **A**

The sentence expresses curiosity about how a travel vlogger manages to sustain constant worldwide travel. The blank needs a phrase that accurately captures the essence of his perpetual movement and how he handles it.

The best answer is "manage his itinerant lifestyle" because "itinerant" precisely describes a travelling way of life. This fits perfectly as it's the correct grammatical form (adjective + noun) and matches the travel context. Other options fail because: "itinerary" is a noun (not an adjective), "iterative" means repetitive (unrelated to travel), and "itinerary in his lifestyle" is grammatically awkward. Only "itinerant" properly conveys the vlogger's mobile existence.

 VIDEO SOLUTION

63. **D**

The four choices given to us are phrases. We look at the meaning of each phrase individually

- (A) Dead ringer: This means an "exact lookalike";, which is irrelevant to the implied meaning here.
- (B) Silver lining: This refers to a positive aspect of a bad situation, which also doesn't fit the context.
- (C) Red herring: This phrase is used to refer to a distraction from a real issue, which is not the intended meaning in the sentence, and hence can't be used here.
- (D) Silver bullet: This refers to a simple solution to a complex problem. The sentence argues that renewable energy alone cannot solve climate change—it's not a one-step fix. Hence, Silver bullet fits perfectly to the context here, and is the most appropriate choice.

Correct answer (D).

64. **A**

The sentence describes labourers who, after being fired, reacted destructively by breaking into the office and damaging machinery. Instead of addressing their grievances through constructive means, they chose a violent approach that worsened their circumstances. The blank requires a phrase that captures how their actions negatively intensified the original problem rather than resolving it.

The correct answer is "exacerbated the situation" (Option A) because it means they made their problems worse through destructive actions, exactly what happened when they broke equipment instead of solving issues constructively.

The other options don't fit: "extended troubles" (Option B) is vague, "exaggerated hardships" (Option C) implies overstating problems rather than worsening them, and "extenuated" (Option D) means making circumstances seem less serious (the opposite of what occurred). Only "exacerbated" accurately describes how their violent response intensified the original conflict.

65. **B**

In the given sentence, the verb is "regard", which takes the proposition "as". So the correct construction should follow " ... to be regarded as... "; secondly, the phrase "one of the" always takes a plural noun, as it essentially implies one of the many.

So the correct sentence should be "Among scientists, the discovery of the double helix structure of DNA and the genetic code it incorporates is widely regarded as one of the most significant scientific discoveries of the twentieth century. ", making option B the correct choice.

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66. **A**

The speaker in the sentence is expressing relief ("*Thank goodness*") that the car's damage was presumably minor or insignificant.

The correct answer is "was negligible" (Option A) because it means the car damage was so minor it didn't matter- matching the relieved tone. The other options are wrong: "neglecting" (Option B) is grammatically incorrect here, "neglectable" (Option C) isn't a real word, and "negligent" (Option D) refers to careless behaviour rather than damage severity. Only "negligible" properly describes trivial damage worth ignoring, making Option A the correct choice here.

67. **D**

The sentence uses "parallel structure". To be grammatically correct, all the verbs mentioned in the sentence [increase, reducing, and enhancing] should follow the same verb form. Each verb is in the infinitive form without "to" (the infinitive structure is to + V1). The correct structure here is therefore the base form of the verb(V1): "increase," "reduce," and "enhance.", which makes Option D the correct answer.

The other options break this parallelism. Option A uses "reducing" and "enhanced," which are inconsistent. Option B introduces incorrect phrases like "reducing of costs" and "enhancing of." Option C starts well but ends with "enhancing," disrupting the verb pattern.

68. **B**

The sentence in the second clause uses "would have handled", which is a would have + past participle structure. The sentence is a conditional, and since the change is only in the first clause, the correct structure should follow the conditional type 3 structure [if + past perfect, ... would have + past participle].

The correct statement should be " If the President had known that his allies would let him down so suddenly, he would have handled them with the greatest care" or "Had the President had known that his allies would let him down so suddenly, he would have handled them with the greatest care ", making option B the correct choice.

69. **A**

The proper grammar structure is "have someone do something". The causative "have + person + base verb" is the standard way to indicate that someone was asked or instructed to perform a task on another's behalf. The correct answer is therefore option A: "had my brother feed my dog"

The other options contain grammatical errors that make them incorrect. Option A: "had my brother to give food" incorrectly inserts "to," which disrupts the standard causative form. Option B: "had my brother giving" uses the -ing form, which suggests an ongoing action rather than the intended meaning of arranged responsibility. Option C: "had my brother who fed" incorrectly turns the phrase into a description rather than an instruction, changing the meaning entirely.

70. **D**

The passage given critiques the use of BMI as a reliable metric for diagnosing obesity and emphasises its limitations. We therefore need a sentence in the blank that directly explains why BMI is problematic, while also logically linking the critique to the details about fat distribution and health that follow in the subsequent lines.

Option A contradicts the paragraph's central claim by suggesting BMI can *pinpoint* the cause of obesity. Option B shifts the focus to social media, which is unrelated to the current discussion. Option C implies that BMI is used to prescribe treatment, which the paragraph does not suggest. Option D correctly extends the idea and supports the critique of BMI's effectiveness. It connects the idea of misdiagnosis to the root issue with BMI, setting up the explanation that follows about how BMI fails to accurately reflect fat distribution and overall health, thereby maintaining the argumentative flow.

The correct answer in this case is therefore option D.



71. **C**

The passage talks about how a Japanese island uses cow manure from its farms to produce hydrogen, which powers the local zoo. The blank needs a concluding statement that summarises the significance of this innovative and sustainable method for energy production.

Option A suggests a recommendation for India, which is unrelated to the paragraph's focus. Option B is vague and doesn't clearly convey the energy context. Option C, however, appropriately concludes the paragraph with a positive, relevant statement about sustainability and technology. Option D misrepresents the information by implying Japan uses technology specifically to help animals, which isn't the main point.

So the correct answer is option C.

72. **C**

The passage talks about how globalisation results in people adopting a common language (lingua franca), thereby abandoning their native languages. It also emphasises that losing a language means more than losing words or communication—it involves losing a way of thinking.

Of the choices given, the best statement to fit here is "Languages exist not only for the purposes of practical communication; they convey a linguistic community's entire mindset and its culture" (Option C) because it directly supports the idea that language loss impacts culture and thought, reinforcing the sentence that follows about the death of a way of thinking.

The other options, while related to language, do not directly explain the deeper significance of language loss. Option A discusses revival movements, Option B talks about endangered languages' status, and Option D focuses on language evolution over time. Option C clearly ties language to mindset and culture, fitting the paragraph's argument perfectly.

The correct answer is therefore Option C.

73. **D**

The given passage talks about India's rising temperatures and related climate risks, highlighting the serious effects on health, water, and energy demand. The blank requires a sentence that sums up the ongoing challenge posed by this increasing heat. Option D [The increasing heat stress remains a major challenge,

affecting public health and economic productivity] perfectly captures this. It directly connects the risks mentioned earlier to their broader impacts, setting the stage for the statistics and consequences described next.

Option A incorrectly minimises the impact of climate change. Option B introduces a detail about the monsoon that is unrelated to the paragraph's main focus. Option C suggests compensation, which isn't mentioned or relevant here. Only option d captures the serious, widespread challenge of heat stress in line with the paragraph's tone and content.

The correct answer is therefore Option D.

74. **D**

The sentence explores the emotional and psychological benefits of art, emphasising how it promotes self-awareness and the control of challenging emotions. Terms that promote the therapeutic advantages of art and its role in personal growth should be used to fill in the blanks.

The best option for the first blank is therapeutic (option D), which relates to concepts like stress reduction and emotional processing and expresses the calming and healing qualities of art. The word "enhance" is the only choice for the second blank since it should imply that "art helps increase self-awareness." Option D is therefore the right one.

The meaning and tone of the other choices are incorrect. "Pleasing; decrease" undermines art's more profound emotional significance and runs counter to the objective of fostering self-awareness. "Acceptable; disturb" creates an unsuitable and startling contrast. "Avoidable; mitigate" is illogical in this situation because art is not something to be avoided, and "mitigate self-awareness" is nonsensical. The sentence can only be meaningfully completed with "therapeutic; enhance" in a clear and accurate manner.

 VIDEO SOLUTION

75. **D**

The sentence describes astronauts who spent *a long time* in space and demonstrated notable strength both physically and mentally. The blanks need to convey the duration of their stay and their impressive endurance and mental *strength*.

Of the choices given, "extended" correctly describes a long period of time, "physical endurance" reflects the astronauts' bodily strength in space, and "mental resilience" captures their psychological strength. All three words fit naturally and accurately with the sentence's meaning.

Option A:[Extensive; dysfunctional; agility] is contradictory—"dysfunctional" implies weakness, which clashes with the idea of impressive endurance. Option B:[Explicit; stoic; integrity] is awkward (explicit period of time). Option C:[Expanded; stern; acuity] sounds forced and unnatural, and "acuity" refers to sharpness of perception, not endurance. Only Option D:[extended; physical; resilience] completes the sentence smoothly and meaningfully. This makes D the best choice.



76. **D**

The sentence discusses curcumin, a substance in turmeric, noting its health benefits and potential side effects. The blanks require words that describe what curcumin is, what it helps with, and what it may negatively lead to in excess.

Of the choices given, "ingredient" correctly identifies curcumin as a component of turmeric, and "induce" accurately describes how excessive intake can *bring about* symptoms like headache and nausea. The middle word "inflammation" fits the narrative, as curcumin might be anti-inflammatory in nature.

Option A: [Enzyme; abrasion; infuse] doesn't fit—as "abrasion" (which refers to the process of scraping something) is unrelated. Option B:[Alkali; infection; promote] is inaccurate because using "promote" in the case of describing something negative is awkward. (Also, curcumin is not an alkali.) Option C:[Alchemy; injury;

cause] is also incorrect, as “alchemy” is not a substance. Only Option D:[ingredient; inflammation; induce] matches both scientific accuracy and sentence flow.

Hence, option D is the correct choice.

77. D

The sentence talks about the philosophical notion that personhood is determined by the structure of human genetic material, which permits higher functions like consciousness and moral cognition, rather than just by genetics alone. The blanks must reflect a logical and precise progression from biological structure to complex human capacities.

The logical flow is best maintained by the words in option D:[premiered; organisation; consciousness] because “premiered” appropriately means “based on,” “organisation” refers to the structured arrangement of genetic material, and “consciousness” aligns with the advanced capacities that personhood implies. This combination is both philosophically accurate and grammatically sound.

Option A:[Dependent; disorganisation; deconstruction] contradicts the intended meaning, suggesting chaos instead of structure. Option B:[Interdependent; division; differentiation] is vague and doesn't clearly support the emergence of consciousness. Option C:[Built; distribution; calibration] lacks conceptual clarity and doesn't align with the philosophical context. Only option D:[premiered; organisation; consciousness] fully captures the intended meaning and logical flow of the sentence.

The correct answer is therefore option D.

78. B

The sentence explains how chronic stress harms health and why certain remedies like mindfulness and sleep are suggested. The blanks must describe how stress negatively affects the immune system and overall well-being, and how these effects can be reversed or managed.

The first blank should use a word that implies the meaning that chronic stress has a negative effect on health. This part tells us what chronic stress does to the immune system, so we need a verb that means to *weaken or damage*. For the second blank, we're continuing the negative effects of stress – it harms overall well-being, so the word should again reflect harm or reduction. For the third blank, we shift to solutions. The sentence talks about what mindfulness and sleep do – so this blank needs a verb that means to fight back or lessen the negative effects.

Of the choices given, the best choice is Option B:[compromise; impair; counter], because “compromise” means to weaken, which fits perfectly with how stress affects the immune system. “Impair” means to damage or reduce, which suits the idea of declining well-being. “Counter” is the right word to describe how mindfulness and sleep help fight back against those negative effects.

Option A:[Undermine; elevate; impede] is contradictory, as “elevate” means to improve, which doesn't fit with the idea of harm. Option C:[Paralyse; improve; diminish] makes no sense since “improve” is a positive word where a negative one is needed. Option D:[Endanger; preserve; decrease] also conflicts because “preserve” doesn't match the context of harm. Only option A logically and clearly completes the sentence.

The correct choice is therefore Option A.

79. B

The sentence explains how social media, especially the actions of influencers, can distort reality and have negative psychological effects on users. The sentence progresses from what influencers do to the consequences for followers.

Blank 1 needs a verb describing what influencers do with their online persona. Since it's “carefully curated,” the word should reflect intentional upkeep or display. Blank 2 must describe the result of this curation – it leads to *unrealistic standards*, so a verb that means to “cause” or “create” is appropriate. Blank 3 deals with the impact on followers – it needs a verb meaning to *cause or initiate* negative self-comparisons.

Of the choices given, the only word fit for the blank 1 is “maintain” (option B). “Maintain” is a perfect fit – it means to uphold or keep up, which aligns with the curated persona. The other choices don't fit here; “Endorse” (option A) means to support or approve of, “advocate” (Option C) means to argue for or support publicly, not about presenting oneself, and “profess” (option D) means to declare or claim openly.

The other two word choices in option B also fit the blanks perfectly. Generate fits well in blank 2— it means to create or bring about (unrealistic standards), and trigger is ideal for blank 3 — it commonly describes initiating emotional or psychological responses.

Hence, the correct choice here is Option B.

80. **B**

In the conversation, Bradley explains, "But there's another dimension or axis too, which is dynamism. That is measured by a new metric we've come up with called the "shuffle rate." How much does the bottom move to the top? It turns out that in this set of wizard-ish industries, or arenas, the shuffle rate is much higher than it is in the traditional industry."

Based on this we can infer that dynamism refers to how much the bottom move to the top, he then explains this to be measured for an industry. Option B captures this and is therefore the correct answer.



81. **D**

At the beginning of the conversation Rahilly mentions "Today we're talking about the next big arenas of competition, about the industries that will matter most in the global business landscape, which you describe as arenas of competition", we can infer from this that 'arenas of competition' refers to the global business landscape and the industries that compete within it. Option A focuses on some specific companies, and is incorrect. Option B talks about government regulations and option C, physical locations, and are also incorrect. Option D captured the essence of Rahilly's description and is the correct answer.

82. **C**

From Bradley's description that "Wizards are defined by growth and dynamism," we can infer that muggles, as opposed to wizards, are industries that are relatively sluggish and non- dynamic. Bradley also points out that "the muggles (even though they run the world, finance the world, and energize the world), play by a more traditional set of economic rules."

Based on these statements, we can conclude that option C is the correct answer. Option A is more characteristic of wizards than muggles. Option B is similar to option A, and option D has not been discussed in the passage.

83. **C**

From Bradley's quote "But there's another dimension or axis too, which is dynamism. That is measured by a new metric we've come up with called the "shuffle rate." How much does the bottom move to the top? It turns out that in this set of wizard-ish industries, or arenas, the shuffle rate is much higher than it is in the traditional industry," we can understand that only options A (volatility), B (competition), and D (relative change) are relevant to 'shuffle rate.' The correct answer is therefore, option C, profitability is not relevant to shuffle rate.

84. **B**

In the context of " wizard industries, we find Chris Bradley explicitly stating: [*The economic profit, which is the profit you make minus the cost for the capital you employ, is in the wizard industries. It's where R&D happens; they're two times more R&D intensive. They're big stars, the nebulae, where new business is born.*] This essentially tells that wizards don't just make money—they make *extra* money after covering all costs, and they invest twice as much in R&D. This is effectively what is stated in option B.

Option A contradicts the data as wizards capture 45% of market-cap growth (high, not slow). Option C is the opposite of the intended definition, which is that Wizards "*play by very different economic rules*" than traditional industries. Option D is directly disproven by the 2x higher R&D intensity cited.

The correct answer is therefore Option B.

85. **B**

The conversation is about a small group of fast-moving, innovative industries ("wizards" like tech/AI), who now dominate the economy—generating 45% of growth and outsized profits—while traditional sectors ("muggles" like oil/retail) lag behind. Wizards win by outspending on R&D and constantly reinventing the game. The business world is splitting into these two tiers. The conversation's central thesis is unmistakable: wizard industries are outpacing traditional ones in growth, profitability, and innovation. Option B directly addresses this.

The conversation's core is about *disruption* and *unequal growth*, not stability (as highlighted in option a), traditional dominance (as highlighted in option c), or fantasy (as highlighted in option d). Only **b** captures the data-driven reality that wizards are eclipsing old industries.

The correct choice is therefore option B.



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86. 52134

The passage discusses the Indus Valley civilisation, which is introduced in Statement 5 as an early urban society, providing necessary context. 5 introduces us to the civilisation as a civilisation from the Bronze Age (old period); and 2 continues on that old period narrative, by stating "...sophistication for its time, this ancient culture ...". This creates a clear lexical tie, so 5 should be followed by 2. Statement 2 elaborates on its urban sophistication (planned cities, sanitation, grid layouts). Statement 1 serves as an example of the "architectural prowess", which is mentioned in statement 2. So 21 forms a logical pair. The order 521 therefore goes: General → Specific (civilisation → urban design → examples). Statement 3 then shifts to economic aspects (trade, agriculture), a natural progression from discussing physical cities to how they were sustained. Statement 4 concludes with the civilisation's decline, a fitting end as it contrasts its achievements with its mysterious downfall, thereby ending with a thought-provoking note on its decline.

The correct order is therefore 52134.

87. 24513

The passage talks about Toyota's AI-powered robots, which can learn cooking skills (like flipping pancakes) from scratch, improving rapidly through AI—but they're not meant for kitchens. This demonstrates how AI is creating adaptable robots for future unknown uses.

Statement 2 introduces the setting and subject - robots cooking in Toyota's lab. This is the natural starting point as it establishes the basic scenario ("robots... cooking"). Statement 4 follows naturally by adding detail about these particular robots' capabilities ("more proficient than most..."), building on the initial introduction. The transition works with "But these robots..." contrasting with generic robotic chefs. Statement 5 then explains what makes these robots different from conventional ones - they weren't laboriously programmed but started with basic skills. This follows logically after establishing their proficiency. Statement 1 provides the next piece of information: how they progressed from basic skills to high proficiency through the use of AI. This directly connects to the "basic set of skills" mentioned in statement 5. Statement 3 serves as the perfect conclusion, revealing that despite their cooking skills, they're not meant for catering, which is a thought-provoking ending that makes us wonder about their actual purpose.

This order 2 → 4 → 5 → 1 → 3 creates a clear progression: Introduction → Capabilities → How they work → How they improved → Surprising conclusion. Each sentence naturally leads to the next with logical connectors. The ending offers an intriguing twist that prompts the reader to think.

The correct order should therefore be **24513**

88. 2143

Statement 2 introduces the key fact about India's position (6th worst-affected) and sets up the climate impact discussion with a specific time frame (1993-2022). This works best as the opener. **Statement 1** naturally follows by expanding the scope from India to show that 7 of the top 10 worst-affected are low/middle-income countries, building on the initial statistic. **Statement 4** then draws the conclusion from these facts - that

developing nations bear disproportionate climate burdens despite low historical emissions. This logically follows the evidence presented in 2 and 1. **Statement 3** provides the contrasting perspective from high-income nations about responsibility, serving as an effective counterpoint to conclude the paragraph.

This order **2 → 1 → 4 → 3** creates clear logical flow: Specific example (India) → Broader pattern (7/10 countries) → Conclusion about burden → Contrasting view

Each sentence naturally leads to the next; The correct order should therefore be 2143.

89. 2431

The passage argues that creativity stems from discovering wonder in everyday moments, thereby challenging the notion that it requires grand inspiration. Statement 2 presents the idea of creativity and discusses what it essentially entails. The idea that only "big" events spur genuine creativity is then refuted in Statement 4. An alternative is offered in Statement 3, which claims that ordinary, everyday experiences can also inspire creativity. It gives examples like sunlight, traffic noises, and the smile of a complete stranger. Statement 1 uses the demonstrative "these", which refers to the everyday moments mentioned in 3, so 31 becomes a pair. 1 also serves as a conclusion, reiterating the central idea that "creativity isn't just about rare, amazing events—it's also about finding the special in the ordinary."

The sequence therefore goes : Defining creativity (2) → Debunking the myth (4) → Showing examples (3) → Revealing the payoff (1).

2431 is therefore the correct order.

90. 3142

The passage discusses how plants adapt to drought conditions by modifying their root growth patterns through certain chemical signals.

Statement 1 talks about the situation when, due to droughts, the water depletes at the topsoil, and Statement 4 gives us a solution as to what plants do to adapt to "these challenging conditions"(using a certain acid). 1,4, therefore, becomes a logical pair. Statement 2 further provides concrete evidence of HOW the acid (mentioned in 4) enables deeper water access, completing the narrative. SO the sequence should follow 142.

Statement 3 introduces the general topic of plants using their root systems to seek water. This is the natural starting point, and not a conclusion, as it establishes the basic biological context. So the correct sequence should be 3142.



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