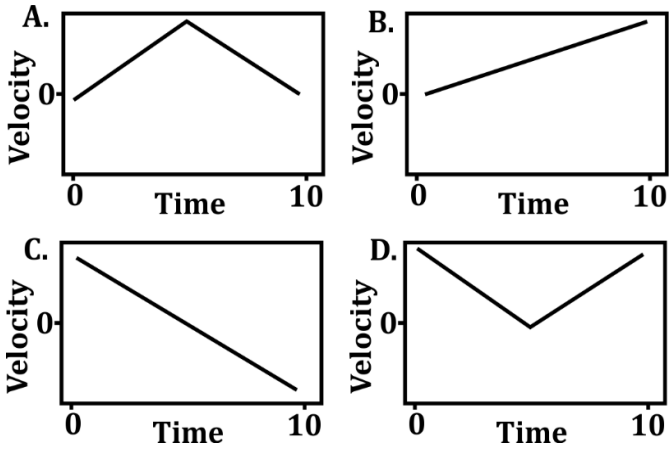
CSIR NET General Aptitude Questions Answers With Solutions

Q1. Which one of the following graphs represents the velocity vs time relation for the motion of a ball thrown upward and returning toward the ground, remaining in air for 10 seconds? (Ignore air resistance.)



(a) A
(b) B
(c) C
(d) D

Q2. A fair coin is tossed 10 times. Let H and T be the number of heads and the number of tails, respectively. The maximum possible value of H x T is

(a) 15
(b) 20
(c) 25
(d) 30

Q3. Two 1.5 L bottles A and B are each filled with 1 L of water. 2 packets of ORS are dissolved in A and 1 packet in B. Then B is filled completely by pouring from A. The ORS concentrations in bottles A and B will be in the ratio

(a) 5.6
(b) 4:5
(c) 3:4
(d) 3:2

Q4. Chairs in 3 colours are placed around a round table such that no two neighbouring chairs have the same colour, and no two pairs of consecutive chairs (in the same direction) have colours in the same order. The maximum number of chairs that can be so placed is

(a) 6
(b) 7
(c) 8
(d) 9

Q5. In a puzzle of filling a grid, each row and column in the 9x9 grid, as well as each 3x3 sub-grid shown with heavy borders, must contain all the digits 1-9.

1	3		8			6		
		2			7	A	B	C
			1	2		D	7	9
2	8							
	9			3			1	
							2	3
5	7			8	3			
			4			9		
		9			2		6	7

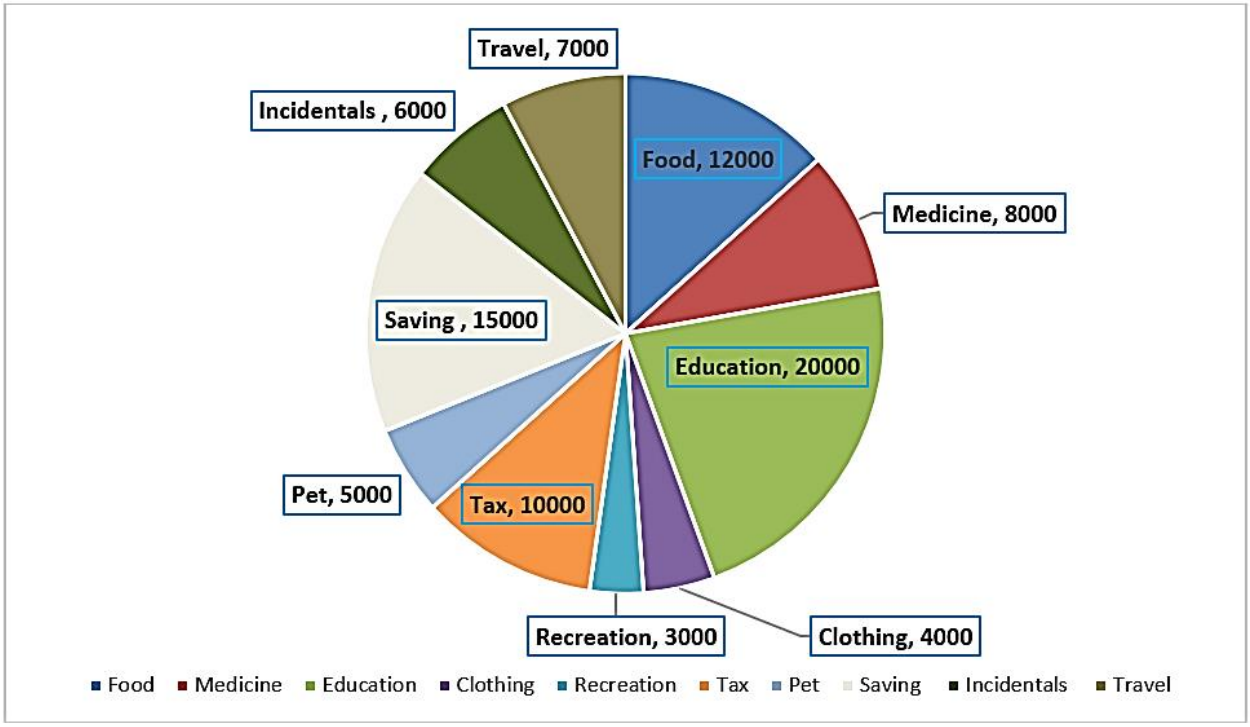
In the above partially filled grid, the number 3 appears in square marked

(a) D
(b) C
(c) B
(d) A

Q6. In a queue each woman is preceded and followed by exactly two men. Which of the following is a possible number of persons in the queue?

(a) 39
(b) 42
(c) 45
(d) 47

Q7. A family whose expenses are shown in the pie chart decides to save 20% more by cutting on certain expenses. What will be the consequent change in the angle of the pie for Savings in the chart?



(a) 10°
(b) 12°
(c) 15°
(d) 18°

Q8. A person leaves for New Delhi, India from New York, USA by a 20 hour flight on a Monday at 6 am, spends 10 hrs in New Delhi and returns to New York by a 20 hour flight on the Wednesday of the same week at 8 am. Based on this, how much is the local time difference between New Delhi and New York?
(a) Cannot be determined
(b) 10 hours
(c) 12 hours
(d) 16 hours

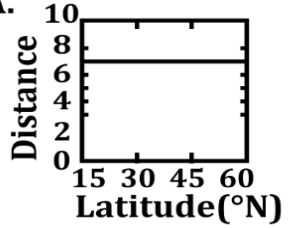
Q9. The ratios of girls to boys in two sections in a class are 3:4 and 3:7 respectively. Their ratio in the entire class (when the two sections are combined) is 4:7. Which of the following can be the strength of the girls in the entire class?
(a) 36
(b) 42
(c) 45
(d) 48

Q10. If $9X^2+16Y^2+24$ is a perfect square, X and Y being integers, then the smallest possible non-negative value of X + Y is
(a) 0
(b) 1
(c) 2
(d) 3

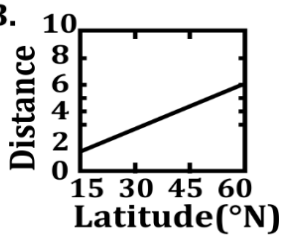
Q11. The monthly production of a commodity increases by 50% (over the previous month) every even month and drops by 20% (over the previous month) every add month. If the monthly production at the close of March was 1 ton, the production at the end of September will be approximately
(a) 3.6 tons
(b) 2.2 tons
(c) 3.0 tons
(d) 1.7 tons

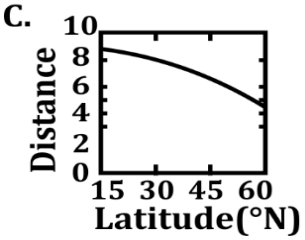
Q12. Which of the following graphs correctly shows the distance (in arbitrary units) between two longitudes 1º apart along the latitude being considered?

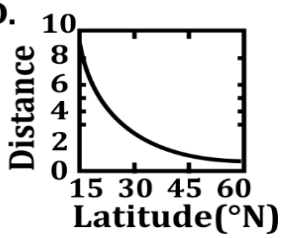
A.



B.



C. 

D. 

(a) A
(b) B
(c) C
(d) D

Q13. Which among the following integers can never be written as the sum of squares of three integers?
(a) 6
(b) 7
(c) 8
(d) 9

Q14. The product 1 ×2×3×4x... × 51 ends with
(a) 10 zeros
(b) 11 zeros
(c) 12 zeros
(d) 14 zeros

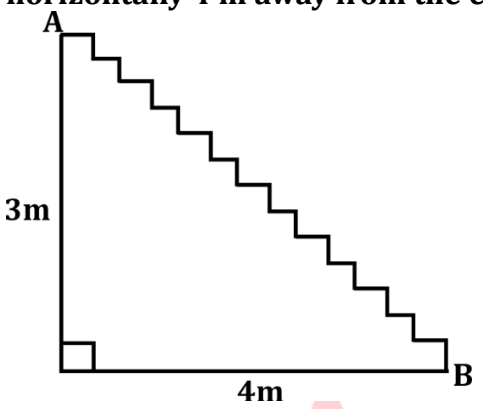
Q15. In the following finite sequence of integers, how many 9s are divisible by their immediate next terms?
8,3,4,9,3,5,9,5,9,9,9,4,5,9,5,6,3,3,5,7,2,3,9,9,8,9,3,9,1,9,4
(a) 3
(b) 4
(c) 5
(d) 6

Q16. Consider three configurations of steel wires for bearing a load
A 2 wires of 1 mm diameter each, together
B 1 wire of 2 mm diameter
C 4 wires of 1 mm diameter each, together
The correct comparison of the load bearing capability of the three configurations is
(a) A=B=C
(b) A<B=C
(c) A<C<B
(d) A B C

Q17. A bucket has 101 water at 15°c. How much water at 50°c should be added to get a mixture of temperature 40°C? (Assume no heat loss in mixing.)
(a) 15 L
(b) 20 L
(c) 25 L
(d) 30 L

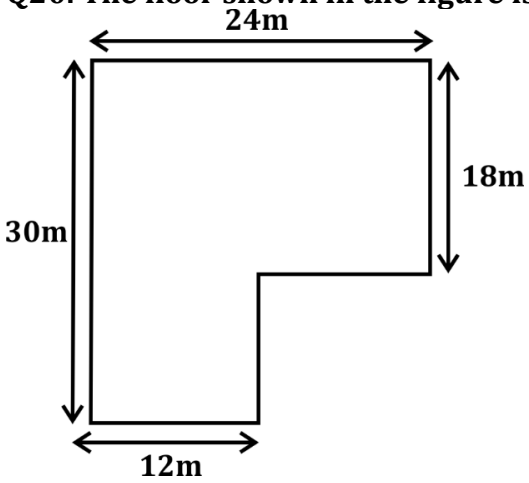
Q18. Shyam buys a watch at a 10% discount on its maximum retail price (MRP). He sells it to Mohan for Rs. 3960 making a profit of 10%. What is the MRP (in Rs.) of the watch?
(a) 4040
(b) 4000
(c) 3960
(d) 4356

Q19. A flight of 13 steps from the ground to a platform of height 3 m is to be carpeted. The steps are all equal and have tread a and rise b. The staircase starts from a point on the ground horizontally 4 m away from the edge of the platform as shown.



Assuming that the width of the carpet is adequate, what is the length of the carpet (in meter) needed to cover all the steps?
(a) 7
(b) 5
(c) $(3a + 4b)/\sqrt{13}$
(d) $\sqrt{13}\ (a+b)$

Q20. The floor shown in the figure is to be covered with square tiles.



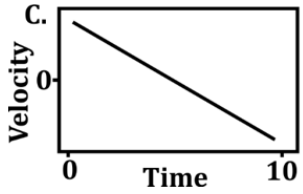
If all tiles are to be of the same size, what is the smallest number of tiles that will do the job?
(a) 14
(b) 6
(c) 32
(d) 16

Solutions

S1. Ans.(c)
Sol. Understanding the Motion
1. **Initial Motion (Upward)**:
   - The ball is thrown upward with some **positive initial velocity**.
   - As it rises, gravity **decelerates** it at **-9.8 m/s²**, reducing velocity to **zero** at the peak.
2. **At the Peak (t = 5s)**:
   - The ball **momentarily stops** before changing direction.
   - The velocity at this point is **zero**.
3. **Descending Motion (Downward)**:
   - The ball accelerates downward under gravity, increasing in the **negative direction**.
   - The velocity magnitude increases until it reaches the **same speed it started with** (but in the opposite direction).

Choosing the Correct Graph
- **Graph A**: Shows velocity increasing and then decreasing, but it does not properly represent the downward motion.
- **Graph B**: Shows velocity only increasing, which is incorrect.
- **Graph C**: Shows a linear decrease in velocity, **starting from a positive value, crossing zero at the peak, and continuing to negative values**—this correctly represents the motion.
- **Graph D**: The sharp V-shape is incorrect because velocity should change smoothly.

Correct Answer:
Option c (Graph C) is correct.



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S2. Ans.(c)
Sol. We are given that a fair coin is tossed 10 times.
Let:
H = Number of heads
T = Number of tails
Since the total number of tosses is 10, we have:
H + T = 10
We need to maximize H × T.

Step 1: Express the Function
We can write:
H × T = H × (10 - H)
Step 2: Find Maximum Value
This expression represents a quadratic function, which reaches its maximum at the midpoint:
H = 10/2 = 5
If H = 5, then T = 10 - 5 = 5.
Thus, H × T = 5 × 5 = 25.
Answer:
The maximum possible value of H × T is 25, so the correct option is C (25).

S3. Ans.(d)
Sol. Given:
Two 1.5 L bottles (A and B) each initially contain 1 L of water.
Bottle A has 2 packets of ORS dissolved in it.
Bottle B has 1 packet of ORS dissolved in it.
Bottle B is then filled completely (to 1.5 L) by pouring water from Bottle A.
We need to find the ratio of ORS concentrations in A and B after this process.
Step 1: Initial ORS Concentrations
Bottle A (Before Transfer):
ORS per liter = 2 packets / 1 L = 2 packets per liter
Bottle B (Before Transfer):
ORS per liter = 1 packet / 1 L = 1 packet per liter
Step 2: Transfer from A to B
Since Bottle B is filled completely, 0.5 L of liquid is transferred from A to B.
This 0.5 L of liquid from A contains ORS at the initial concentration in A:
ORS in 0.5 L from A = 0.5 × 2 = 1 packet
New ORS content in Bottle B:
Initially: 1 packet
Added from A: 1 packet
Total ORS in B = 2 packets
Total volume in B = 1.5 L
New ORS concentration in B = 2 / 1.5 = 4/3 packets per liter
Remaining ORS in Bottle A:
Initially: 2 packets
Transferred to B: 1 packet
Remaining in A = 1 packet
Total volume in A = 1 L (original) - 0.5 L (transferred) = 0.5 L
New ORS concentration in A = 1 / 0.5 = 2 packets per liter
Step 3: Finding the Ratio
ORS concentration in A = 2 packets per liter
ORS concentration in B = 4/3 packets per liter
Ratio of ORS concentrations (A:B) = 2 : (4/3) = (2 × 3) : 4 = 6:4 = 3:2
Since the answer choices are in the form A:B, we take the inverse:
Ratio A:B = 3:2
Final Answer:
(D) 3:2

S4. Ans.(a)
Sol. Given:
There are chairs in 3 colors: A, B, C.
No two neighboring chairs have the same color.
No two consecutive pairs of chairs (in the same direction) have colors in the same order.
Find the maximum number of chairs that can be placed.
Concept Used:
The first condition ensures that no two adjacent chairs have the same color.
The second condition prevents repeating adjacent pairs in the same order.
This restriction significantly reduces the number of possible placements.
Solution with Example:
Let's try placing the chairs in a valid sequence:
Start with A.
The next chair must be different, so choose B.
The next chair must be different, so choose C.
The fourth chair must be different from the previous one, so place A.
The fifth chair must be different from A, so choose C.
The sixth chair must be different from C, so choose B.
Now we have this sequence:
A - B - C - A - C - B
This arrangement satisfies both conditions:
No two consecutive chairs have the same color.
No two adjacent pairs (AB, BC, CA, AC, CB) repeat in the same order.
If we try to place a 7th chair, we will be forced to repeat an earlier adjacent pair, violating the given condition.
Thus, the maximum number of chairs that can be placed is 6.
Final Answer:
(A) 6

S5. Ans.(a)
Sol. Solution:
Understanding the Sudoku Rules:
Each row and column must contain digits 1 to 9 exactly once.
Each 3×3 sub-grid (with heavy borders) must also contain digits 1 to 9 exactly once.
Focusing on the 3×3 sub-grid containing A, B, C, and D:
The grid already has some numbers filled in.
The missing numbers in the top-right 3×3 sub-grid must be placed correctly according to Sudoku rules.
Finding the correct placement for 3:
Checking the existing 3s in the grid, we see their positions in other 3×3 sub-grids.
The only valid placement for 3 in the given 3×3 sub-grid is in square D.
Final Answer:
Thus, the number 3 appears in square D, making option (a) D the correct answer.

S6. Ans.(d)
Sol. Given:
Each woman (W) is preceded and followed by exactly two men (M) in a queue.
We need to determine a possible total number of persons in the queue.
Concept Used:
Each woman (W) is always surrounded by two men (M) on both sides, forming a group of three people (M W M).
Additionally, there are two extra men at the beginning and end of the queue.
The queue structure follows this pattern:
M - (M W M) - (M W M) - ... - (M W M) - M
If W is the number of women, then:
The number of men (M) will be 2W + 2 (since there are 2 extra men at the start and end).
The total number of people in the queue is:
Total people = W + (2W + 2) = 3W + 2
Solution:
The total number of people must be in the form 3W + 2. Let's check which option satisfies this:
39 → 39 = 3W + 2 → W = 37/3 = 12.33 (Not an integer)
42 → 42 = 3W + 2 → W = 40/3 = 13.33 (Not an integer)
45 → 45 = 3W + 2 → W = 43/3 = 14.33 (Not an integer)
47 → 47 = 3W + 2 → W = 45/3 = 15 (Valid integer)
Since W = 15 is an integer, 47 is a possible total number of persons in the queue.
Final Answer:
(D) 47

S7. Ans.(b)
Sol. Given:
Current savings = 15,000
Total expenses = 12,000 + 8,000 + 20,000 + 4,000 + 3,000 + 10,000 + 5,000 + 15,000 + 6,000 + 7,000
Increase in savings = 20% of 15,000
Concept Used:
The angle corresponding to any category in a pie chart is given by:
Angle = (Category Value / Total Value) × 360
The increase in savings will lead to a new calculation for its angle, and the change in angle is found by subtracting the original angle from the new one.
Formula Used:
New Savings = Old Savings + 0.2 × Old Savings
Change in Angle = New Angle - Old Angle
Solution:
Calculate Total Expenses:
12,000 + 8,000 + 20,000 + 4,000 + 3,000 + 10,000 + 5,000 + 15,000 + 6,000 + 7,000 = 90,000
Original Angle for Savings:
(15,000 / 90,000) × 360 = 60°

New Savings Amount:
15,000 + (0.2 × 15,000) = 18,000
New Angle for Savings:
New total expenses remain 90,000 (since 3,000 is shifted within the same total).
(18,000 / 90,000) × 360 = 72°
Change in Angle:
72° - 60° = 12°
Final Answer: (b) 12°

S8. Ans.(a)
Sol. Given:
A person leaves New York at 6 AM (Monday) on a 20-hour flight to New Delhi.
Spends 10 hours in New Delhi.
Returns to New York on Wednesday at 8 AM (New York time) after a 20-hour flight.
We need to determine the local time difference between New Delhi and New York.
Concept Used:
Let the time difference between New Delhi and New York be X hours (New Delhi ahead of New York).
Calculate the arrival time in New Delhi using this unknown X.
Use the given return flight timing to check consistency.
Step 1: Finding Arrival Time in New Delhi
Departure from New York → Monday at 6 AM
Flight duration → 20 hours
Arrival time in New York time → Monday at 6 AM + 20 hours = Tuesday at 2 AM (New York time)
In New Delhi time, this would be Tuesday at (2 AM + X hours)
Step 2: Finding Departure Time from New Delhi
Spends 10 hours in New Delhi, so departure time in New Delhi time →
Tuesday at (2 AM + X + 10 hours) = Tuesday at (12 PM + X)
Step 3: Finding Arrival Time in New York
Takes a 20-hour return flight, so arrival time in New York time is:
(12 PM + X) - 20 hours
Given that arrival is Wednesday at 8 AM New York time, we solve:
(12 PM + X) - 20 = 8 AM
12 + X - 20 = 8
X - 8 = 8
X = 16 hours
Issue with the Calculation:
New Delhi is NOT 16 hours ahead of New York in reality.
The actual time difference varies between 9.5 hours (Standard Time) and 10.5 hours (Daylight Saving Time in New York).
The problem does not specify whether Daylight Saving Time (DST) is in effect, which changes the time difference.
Since the time difference varies based on the season, we cannot uniquely determine the correct time difference based on the given data.
Final Answer:
(A) Cannot be determined

S9. Ans.(a)
Sol. Given:
The ratio of girls to boys in Section 1 is 3:4.
The ratio of girls to boys in Section 2 is 3:7.
The overall girls to boys ratio in the entire class is 4:7.
We need to determine the possible number of girls in the entire class.
Concept Used:
Let the number of girls and boys in Section 1 be 3x and 4x respectively.
Let the number of girls and boys in Section 2 be 3y and 7y respectively.
The total number of girls in the class = 3x + 3y.
The total number of boys in the class = 4x + 7y.
Given that the total ratio of girls to boys is 4:7, **we set up the equation:**
(3x + 3y) / (4x + 7y) = 4/7
Cross multiplying:
7(3x + 3y) = 4(4x + 7y)
Expanding:
21x + 21y = 16x + 28y
Rearranging:
5x = 7y
So, x : y = 7 : 5.
Let x = 7k and y = 5k.
Then,
Total girls = 3x + 3y
= 3(7k) + 3(5k) = 21k + 15k = 36k
Solution:
The number of girls must be a multiple of 36.
Checking the options:
36 → Valid (36 = 36 × 1)
42 → (Not a multiple of 36)
45 → (Not a multiple of 36)
48 → (Not a multiple of 36)
Thus, the possible strength of girls in the entire class is 36.
Final Answer:
(A) 36

S10. Ans.(a)
Sol. Given:
We have the expression:
$9X^2 + 16Y^2 + 24$
where X and Y are integers, and we need to find the smallest non-negative value of X + Y such that the expression is a perfect square.
Concept Used:
For the given quadratic expression to be a perfect square, it must be expressible as:
$(A X + B Y + C)^2$
for some integers A, B, and C.

Solution:
The given expression is:
$9X^2 + 16Y^2 + 24$
To be a perfect square, the constant term 24 must allow the entire expression to be written as a squared term.
Let's check the smallest possible integer values of X and Y that satisfy this condition:
If X = 0 and Y = 0:
$9(0)^2 + 16(0)^2 + 24 = 24$
which is not a perfect square.
If X = 1 and Y = 1:
$9(1)^2 + 16(1)^2 + 24 = 9 + 16 + 24 = 49$
which is a perfect square (7^2).
If X = -1 and Y = -1:
$9(-1)^2 + 16(-1)^2 + 24 = 9 + 16 + 24 = 49$
which is also a perfect square.
The smallest non-negative value of X + Y is when X = 0 and Y = 0, giving:
X + Y = 0 + 0 = 0
Final Answer:
(A) 0

S11. Ans.(d)
Sol. Given:
The monthly production follows a pattern:
Increases by 50% every even month (multiply by 1.5).
Decreases by 20% every odd month (multiply by 0.8).
The production at the end of March is 1 ton.
We need to find the production at the end of September.
Solution:
Starting with March = 1 ton:
April (Increase by 50%) → 1 × 1.5 = 1.5 tons
May (Decrease by 20%) → 1.5 × 0.8 = 1.2 tons
June (Increase by 50%) → 1.2 × 1.5 = 1.8 tons
July (Decrease by 20%) → 1.8 × 0.8 = 1.44 tons
August (Increase by 50%) → 1.44 × 1.5 = 2.16 tons
September (Decrease by 20%) → 2.16 × 0.8 = 1.73 tons
Thus, the production at the end of September is approximately 1.7 tons.
Final Answer:
(D) 1.7 tons

S12. Ans.(c)
Sol. Concept Used:
The Earth is approximately a sphere, and the distance between two longitudes 1° apart along a given latitude is given by:
Distance = (Equatorial Distance) × cos(latitude)
where the equatorial distance between two longitudes 1° apart is approximately 111.32 km.
Since cos(latitude) decreases as latitude increases, the distance between two longitudes also decreases as we move towards the poles.

Step 1: Expected Graph Shape

The function cos(latitude) gradually decreases as latitude increases from 0° (equator) to 90° (pole).

The distance should decrease smoothly, following the shape of the cosine curve.

This means the graph should show a gradual decline, not a sharp drop.

Step 2: Analyzing the Given Graphs

Graph A: Constant distance → Incorrect, because the distance should change with latitude.

Graph B: Increasing distance → Incorrect, as distance should decrease, not increase.

Graph C: Gradually decreasing curve → Correct, as it matches the expected behavior of cos(latitude).

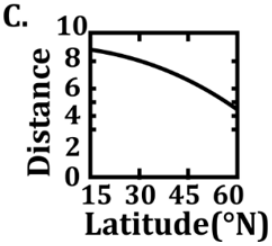
Graph D: Sharp decrease → Incorrect, as cos(latitude) decreases smoothly, not sharply.

Final Answer:

(C) C

The correct choice is Graph C because it best represents the gradual decrease in distance between longitudes as latitude increases.

C.



S13. Ans.(b)

Sol. Given:

We need to determine which number among 6, 7, 8, and 9 cannot be written as the sum of squares of three integers.

Concept Used:

A number N can be expressed as the sum of squares of three integers unless it satisfies a special condition:

If $N \equiv 7 \pmod 8$ (meaning when divided by 8, the remainder is 7), then N cannot be written as the sum of three squares.

This is based on number theory (Lagrange's three-square theorem).

Solution:

We check each number modulo 8:

$6 \pmod 8 = 6$

Can be written as $2^2 + 1^2 + 1^2 = 6$

$7 \pmod 8 = 7$

Numbers of this form cannot be expressed as the sum of three squares

$8 \pmod 8 = 0$

Can be written as $2^2 + 2^2 + 0^2 = 8$

$9 \pmod 8 = 1$

Can be written as $3^2 + 0^2 + 0^2 = 9$

Since 7 is the only number that cannot be expressed as the sum of three squares, the answer is 7.

Final Answer:

(B) 7

S14. Ans.(c)
Sol. Given:
We need to determine how many trailing zeros are in the product:
$1 \times 2 \times 3 \times ... \times 51$
which is 51! (51 factorial).
Concept Used:
The number of trailing zeros in N! (factorial of N) is determined by the number of times 10 appears as a factor.
Since $10 = 2 \times 5$, and there are always more factors of 2 than 5, the number of trailing zeros is determined by the number of times 5 appears as a factor.
The formula to count trailing zeros in N! is:
Zeros = [N/5] + [N/25] + [N/125] + ...
where [x] represents the integer division (floor function).
Solution:
For **51!**, we calculate the number of factors of 5:
[51/5] = 10 (Numbers: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50)
[51/25] = 2 (Numbers: 25, 50)
[51/125] = 0 (Since 125 > 51, this term is 0)
Total trailing zeros:
10 + 2 + 0 = 12
Final Answer:
(C) 12

S15. Ans.(d)
Sol. Given:
We have the following sequence of integers:
8, 3, 4, 9, 3, 5, 9, 5, 9, 9, 9, 4, 5, 9, 5, 6, 3, 3, 5, 7, 2, 3, 9, 9, 8, 9, 3, 9, 1, 9, 4
We need to find how many 9s are divisible by their immediate next terms.
Solution:
We locate all 9s in the sequence and check divisibility by the next number.
9, 3 → 9 ÷ 3 = 3
9, 5 → 9 ÷ 5 = Not divisible
9, 5 → 9 ÷ 5 = Not divisible
9, 9 → 9 ÷ 9 = 1
9, 9 → 9 ÷ 9 = 1
9, 4 → 9 ÷ 4 = Not divisible
9, 5 → 9 ÷ 5 = Not divisible
9, 9 → 9 ÷ 9 = 1
9, 8 → 9 ÷ 8 = Not divisible
9, 3 → 9 ÷ 3 = 3
9, 1 → 9 ÷ 1 = 9
9, 4 → 9 ÷ 4 = Not divisible
Count of valid cases:
Six 9s are divisible by their next term.
Final Answer:
(D) 6

S16. Ans.(b)
Sol. Given:
We have three different configurations of steel wires used for bearing a load:
A: Two wires of 1 mm diameter each, together.
B: One wire of 2 mm diameter.
C: Four wires of 1 mm diameter each, together.
We need to compare their load-bearing capability.
Concept Used:
The load-bearing capacity of a wire is proportional to its cross-sectional area.
The cross-sectional area A of a wire with diameter d is given by:
$A = \pi(d/2)^2$
This means the load-bearing capability depends on the sum of the cross-sectional areas of the wires in each configuration.
Solution:
Configuration A: Two 1 mm Wires
Each wire has a diameter of 1 mm, so its cross-sectional area is:
$A_1 = \pi(1/2)^2 = \pi(1/4) = \pi/4$
For two wires:
Total Area = $2 \times (\pi/4) = \pi/2$
Configuration B: One 2 mm Wire
A single wire with 2 mm diameter has a cross-sectional area:
$A_2 = \pi(2/2)^2 = \pi(1) = \pi$
Configuration C: Four 1 mm Wires
Each 1 mm wire has an area of $\pi/4$.
For four wires:
Total Area = $4 \times (\pi/4) = \pi$
Comparison of Load-Bearing Capacity:
A (2 wires of 1 mm each) → $\pi/2$
B (1 wire of 2 mm) → π
C (4 wires of 1 mm each) → π
Thus, B = C > A.
Final Answer:
(B) A < B = C

S17. Ans.(c)
Sol. Given:
Initial water: 10 L at 15°C
Added water: x L at 50°C
Final mixture temperature: 40°C
No heat loss (heat gained = heat lost).
Concept Used:
The principle of heat exchange states:
Heat gained by cooler water = Heat lost by hotter water
The heat gained or lost by a substance is given by:
$Q = m \times c \times \Delta T$

where:
m = mass (or volume in this case, since density of water is 1 kg/L)
c = specific heat (same for water, so it cancels out)
ΔT = change in temperature
Thus, we set up the equation:
(Mass of cold water) × (Temp increase) = (Mass of hot water) × (Temp decrease)
Solution:
Heat gained by cold water (10 L at 15°C):
10 × (40 - 15) = 10 × 25 = 250
Heat lost by hot water (x L at 50°C):
x × (50 - 40) = x × 10 = 10x
Setting heat gained = heat lost:
250 = 10x
Solving for x:
x = 250 / 10 = 25 L
Final Answer:
(C) 25 L

S18. Ans.(b)
Sol. Given:
Shyam buys a watch at 10% discount on the MRP.
He sells it to Mohan for Rs. 3960, making a 10% profit.
We need to find the MRP of the watch.
Concept Used:
Let the MRP of the watch be Rs. X.
Shyam gets a 10% discount on the MRP, so his cost price (CP) is:
CP = 90% of X = 0.9X
He sells it at 10% profit, so the Selling Price (SP) = CP × 1.1:
SP = (0.9X) × 1.1 = 0.99X
Given that SP = 3960, we set up the equation:
0.99X = 3960
Solving for X:
X = 3960 / 0.99 = 4000
Thus, the MRP of the watch is Rs. 4000.
Final Answer:
(B) 4000

S19. Ans.(a)
Sol. Given:
A staircase has 13 steps reaching a platform of height 3 m.
The staircase starts 4 m horizontally away from the platform.
Each step has:
Tread (horizontal distance) = a
Rise (vertical distance) = b
We need to find the total length of carpet required to cover all steps.

Concept Used:
Each step consists of:
Tread (horizontal part of the step)
Rise (vertical part of the step)
The total length of the carpet required must cover both the tread and the rise for each step.
Step 1: Finding the values of a and b
The total horizontal distance covered by the staircase is 4 meters.
The total vertical height is 3 meters.
Since there are 13 steps, each step contributes:
Tread (a) = 4/13 meters
Rise (b) = 3/13 meters
Step 2: Finding the total carpet length
For each step, the carpet must cover both a (tread) and b (rise).
The total carpet required for one step is:
a + b = (4/13) + (3/13) = 7/13 meters
Since there are 13 steps, the total carpet length is:
13 × (7/13) = 7 meters
Final Answer:
(A) 7

S20. Ans.(d)
Sol. Given:
The floor is L-shaped with dimensions:
Total width = 24 m
Total height = 30 m
Cut-out section: 12 m × 18 m
We need to find the smallest number of square tiles required to cover the floor.
Step 1: Identify the Largest Possible Square Tile Size
The tile size should be the Greatest Common Divisor (GCD) of the given dimensions.
Widths involved: 24 m, 12 m → GCD = 12 m
Heights involved: 30 m, 18 m → GCD = 6 m
The largest square tile that fits perfectly is 6m × 6m.
Step 2: Count the Number of Tiles in Each Section
The L-shaped floor can be divided into two rectangles:
Left Rectangle (12m × 30m)
Width: 12m ÷ 6m = 2 tiles
Height: 30m ÷ 6m = 5 tiles
Total tiles = 2 × 5 = 10
Right Rectangle (12m × 18m)
Width: 12m ÷ 6m = 2 tiles
Height: 18m ÷ 6m = 3 tiles
Total tiles = 2 × 3 = 6
Step 3: Find the Total Number of Tiles
Total tiles required:
10 + 6 = 16 tiles
Final Answer:
(D) 16