Symbiosis Entrance Test (SET)

Quantitative Aptitude — Sample Paper 1

Total Questions:	16	**Maximum Marks:**	16
Duration:	16 minutes	**Marking Scheme:**	+1 per correct answer, no negative marking
Mode:	Online CBT		

Instructions

1. This paper contains **16 multiple-choice questions** carrying **1 mark each**.
2. Each question has **four options** (A)–(D). Choose the single best answer.
3. There is **no negative marking** for wrong answers.
4. Attempt all questions within the stipulated time of **16 minutes**.
5. Syllabus: Arithmetic, Algebra, Geometry, Data Interpretation, and Probability — class 9–10 level, as tested in SET (Symbiosis Entrance Test).

SECTION: Quantitative Aptitude (16 Questions × 1 Mark)

Q1. A shopkeeper increases the price of an item by 20% and then decreases the resultant price by 15%. What is the net percentage change in the original price?

(A) 5% increase
(B) 3% increase
(C) 2% increase
(D) 1% decrease

Q2. The average weight of 8 men is 66 kg. When one man weighing 80 kg leaves the group, what is the new average weight of the remaining 7 men?

(A) 64 kg
(B) 60 kg

(C) 62 kg
(D) 68 kg

Q3. In an election with 8000 votes cast, Candidate A receives 55% of the votes. How many votes did Candidate B get?

(A) 4400
(B) 3600
(C) 3200
(D) 4000

Q4. What is the LCM of 18, 24, and 36?

(A) 36
(B) 48
(C) 54
(D) 72

Q5. What is the unit digit of 3^{45}?

(A) 9
(B) 1
(C) 3
(D) 7

Q6. The ratio of boys to girls in a class is $3 : 2$. If there are 40 students in total, how many are boys?

(A) 24
(B) 16
(C) 20
(D) 18

Q7. A and B start a business. A invests Rs. 5000 and B invests Rs. 7500, both for one year. If the total profit is Rs. 2400, what is B's share of the profit?

(A) Rs. 960

(B) Rs. 1440
(C) Rs. 1200
(D) Rs. 1800

Q8. A merchant marks goods at 40% above cost price and gives a 15% discount. What is his profit percentage?

(A) 20%
(B) 25%
(C) 15%
(D) 19%

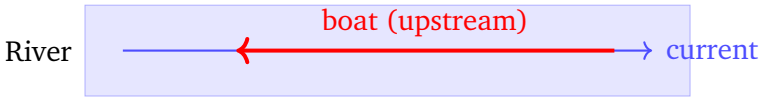
Q9. Two successive discounts of 10% and 20% are offered on an article. What is the equivalent single discount percentage?

(A) 30%
(B) 25%
(C) 28%
(D) 32%

Q10. Two trains of length 150 m and 100 m are moving towards each other at speeds of 60 km/h and 40 km/h respectively. How long (in seconds) will they take to completely cross each other?

(A) 9 seconds
(B) 10 seconds
(C) 12 seconds
(D) 15 seconds

Q11. A boat's speed in still water is 12 km/h and the speed of the stream is 4 km/h. How many hours will the boat take to travel 32 km upstream?



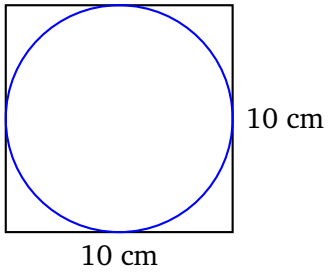
(A) 3 hours
(B) 4 hours

(C) 5 hours
(D) 2.5 hours

Q12. If $2x + 3y = 12$ and $3x - 2y = 5$, find the value of $x + y$.

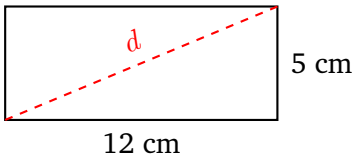
(A) 4
(B) 6
(C) 3
(D) 5

Q13. A circle is inscribed in a square of side 10 cm. What is the area of the region inside the square but outside the circle? (Use $\pi = 3.14$)



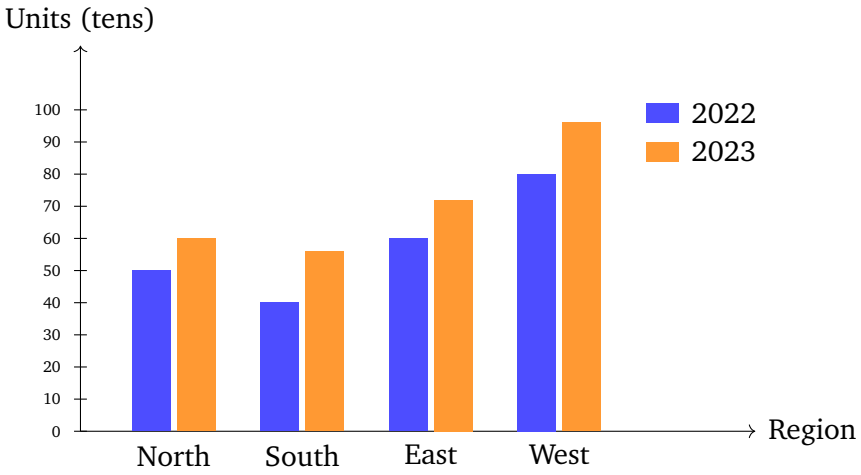
(A) 22.5 cm^2
(B) 19.5 cm^2
(C) 21.5 cm^2
(D) 25 cm^2

Q14. A rectangle has length 12 cm and breadth 5 cm. What is the length of its diagonal?



(A) 13 cm
(B) 15 cm
(C) 11 cm
(D) 10 cm

Q15. The bar chart below shows the units sold by 4 regions in 2022 and 2023. Which region had the highest percentage growth in sales from 2022 to 2023?



(A) North
(B) South
(C) East
(D) West

Q16. A bag contains 4 red, 3 blue, and 2 green balls. One ball is drawn at random. What is the probability that the drawn ball is red?

(A) $\frac{1}{3}$
(B) $\frac{1}{2}$
(C) $\frac{2}{9}$
(D) $\frac{4}{9}$

DETAILED SOLUTIONS

Sol. 1.

Solution

Topic: Percentages / Successive Change

Let the original price be 100.
After 20% increase: $100 \times 1.20 = 120$.
After 15% decrease: $120 \times 0.85 = 102$.

Net change $= 102 - 100 = 2$ (increase).
Net percentage change $= \mathbf{2\%}$ increase.

Answer: (C) Go Back to Q 1

Sol. 2.

Solution

Topic: Averages

Total weight of 8 men $= 8 \times 66 = 528$ kg.
After the 80 kg man leaves, total $= 528 - 80 = 448$ kg.
New average $= \dfrac{448}{7} = \mathbf{64}$ kg.

Answer: (A) Go Back to Q 2

Sol. 3.

Solution

Topic: Percentages / Election

Candidate A gets 55% of $8000 = 4400$ votes.
Candidate B gets the remaining votes:

$$8000 - 4400 = \mathbf{3600} \text{ votes.}$$

Answer: (B) Go Back to Q 3

Sol. 4.

Solution

Topic: Number System / LCM

Prime factorizations:

$$18 = 2 \times 3^2, \quad 24 = 2^3 \times 3, \quad 36 = 2^2 \times 3^2.$$

LCM $= 2^3 \times 3^2 = 8 \times 9 = \mathbf{72}$.

Answer: (D) Go Back to Q 4

Sol. 5.

Solution

Topic: Number System / Unit Digit

The unit digits of powers of 3 repeat in a cycle of 4:
$3^1 \to 3,\ 3^2 \to 9,\ 3^3 \to 7,\ 3^4 \to 1,\ 3^5 \to 3, \ldots$

$45 = 4 \times 11 + 1$, so the remainder is 1.
Unit digit of 3^{45} is the same as 3^1, which is **3**.

Answer: (C) Go Back to Q 5

Sol. 6.

Solution

Topic: Ratio and Proportion

Ratio of boys to girls $= 3 : 2$. Total parts $= 5$.
Number of boys $= \frac{3}{5} \times 40 =$ **24**.

Answer: (A) Go Back to Q 6

Sol. 7.

Solution

Topic: Partnership

A's investment : B's investment $= 5000 : 7500 = 2 : 3$.
Total parts $= 5$.
B's share $= \frac{3}{5} \times 2400 =$ Rs. **1440**.

Answer: (B) Go Back to Q 7

Sol. 8.

Solution

Topic: Profit, Loss and Marked Price

Let Cost Price (CP) $= 100$.
Marked Price (MP) $= 100 \times 1.40 = 140$.
Selling Price (SP) after 15% discount $= 140 \times 0.85 = 119$.

Profit $= 119 - 100 = 19$.
Profit percentage $=$ **19**%.

Answer: (D) Go Back to Q 8

Sol. 9.

Solution

Topic: Successive Discounts

Let the marked price be 100.

After 10% discount: $100 \times 0.90 = 90$.

After 20% discount: $90 \times 0.80 = 72$.

Equivalent single discount $= 100 - 72 = \mathbf{28\%}$.

Answer: (C) Go Back to Q 9

Sol. 10.

Solution

Topic: Time, Speed and Distance — Trains

Since the trains move *towards* each other, their relative speed $= 60 + 40 = 100$ km/h.

Convert to m/s: $100 \times \dfrac{1000}{3600} = \dfrac{250}{9}$ m/s.

Total length to be covered $= 150 + 100 = 250$ m.

Time $= \dfrac{250}{250/9} = 250 \times \dfrac{9}{250} = \mathbf{9}$ seconds.

Answer: (A) Go Back to Q 10

Sol. 11.

Solution

Topic: Boats and Streams

Upstream speed = speed in still water − stream speed $= 12 - 4 = 8$ km/h.

Time to travel 32 km upstream $= \dfrac{32}{8} = \mathbf{4}$ hours.

Answer: (B) Go Back to Q 11

Sol. 12.

Solution

Topic: Algebra / Linear Equations

Given:

$$2x + 3y = 12 \quad \cdots(1), \qquad 3x - 2y = 5 \quad \cdots(2).$$

Multiply (1) by 2 and (2) by 3:

$$4x + 6y = 24, \qquad 9x - 6y = 15.$$

Adding: $13x = 39 \Rightarrow x = 3$.
Substituting in (1): $6 + 3y = 12 \Rightarrow y = 2$.
$x + y = 3 + 2 = \mathbf{5}$.

Answer: (D) Go Back to Q 12

Sol. 13.

Solution

Topic: Geometry / Circle Inscribed in Square

Side of square $= 10$ cm, so radius of inscribed circle $= 5$ cm.

Area of square $= 10^2 = 100$ cm^2.
Area of circle $= \pi r^2 = 3.14 \times 25 = 78.5$ cm^2.

Required area $= 100 - 78.5 = \mathbf{21.5}$ cm^2.

Answer: (C) Go Back to Q 13

Sol. 14.

Solution

Topic: Geometry / Rectangle Diagonal

By Pythagoras' theorem:

$$d = \sqrt{l^2 + b^2} = \sqrt{12^2 + 5^2} = \sqrt{144 + 25} = \sqrt{169} = \mathbf{13} \text{ cm}.$$

Answer: (A) Go Back to Q 14

Sol. 15.

Solution

Topic: Data Interpretation / Bar Chart

Region	2022	2023	Growth	% Growth
North	50	60	10	$(10/50) \times 100 = 20\%$
South	40	56	16	$(16/40) \times 100 = \mathbf{40}\%$
East	60	72	12	$(12/60) \times 100 = 20\%$
West	80	96	16	$(16/80) \times 100 = 20\%$

South had the highest percentage growth at 40%.

Answer: (B) Go Back to Q 15

Sol. 16.

Solution

Topic: Probability

Total balls $= 4 + 3 + 2 = 9$.

Number of red balls $= 4$.

$P(\text{red}) = \frac{4}{9}$.

Answer: (D) Go Back to Q 16

ANSWER KEY

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	C	2	A	3	B	4	D	5	C
6	A	7	B	8	D	9	C	10	A
11	B	12	D	13	C	14	A	15	B
16	D								