

Symbiosis Entrance Test (SET)

Quantitative Aptitude — Sample Paper 9

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)

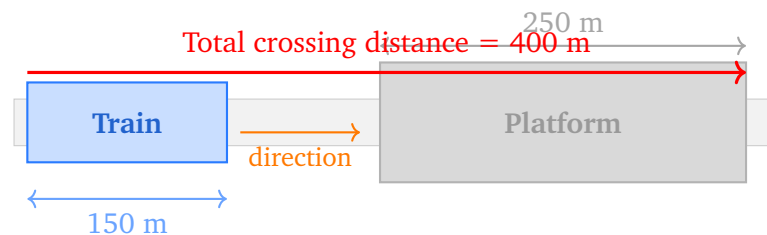
- Q1.** A salaried employee earns Rs. 5,80,000 per year. Income up to Rs. 2,50,000 is tax-free. Income from Rs. 2,50,001 to Rs. 5,00,000 is taxed at 5%. Income above Rs. 5,00,000 is taxed at 20%. How much income tax does the employee pay?
- (A) Rs. 24,500
(B) Rs. 26,000
(C) Rs. 27,500
(D) Rs. 28,500
- Q2.** Group X has 20 students with an average score of 70. Group Y has 30 students with an average score of 80. What is the combined mean score of all 50 students?
- (A) 76

- (B) 74
- (C) 75
- (D) 78

Q3. Find the compound interest on Rs. 8,000 at 10% per annum, compounded half-yearly, for 1 year.

- (A) Rs. 800
- (B) Rs. 820
- (C) Rs. 840
- (D) Rs. 860

Q4. A train 150 m long crosses a platform 250 m long at 72 km/h. How many seconds does the train take to completely cross the platform?



- (A) 15 s
- (B) 18 s
- (C) 20 s
- (D) 25 s

Q5. The HCF of two numbers is 12 and their LCM is 180. If one of the numbers is 36, find the other number.

- (A) 48
- (B) 54
- (C) 72
- (D) 60

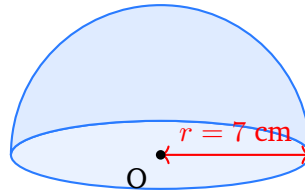
Q6. If α and β are the roots of $2x^2 - 5x + 3 = 0$, find the value of $\alpha^2 + \beta^2$.

- (A) $\frac{13}{4}$



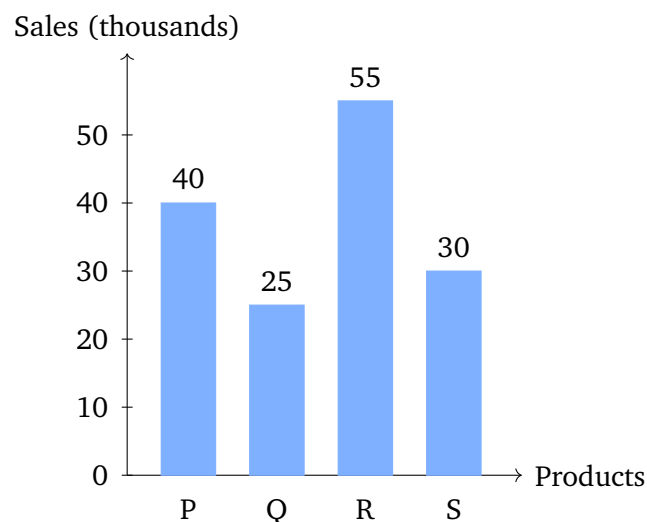
- (B) $\frac{7}{2}$
(C) $\frac{19}{4}$
(D) 4

Q7. Find the total surface area of a solid hemisphere of radius 7 cm. (Use $\pi = 22/7$)



- (A) 308 cm^2
(B) 462 cm^2
(C) 616 cm^2
(D) 154 cm^2

Q8. The bar chart below shows the monthly sales (in thousands of units) of four products. What percentage of the total sales does product R account for? (Answer to the nearest whole number.)

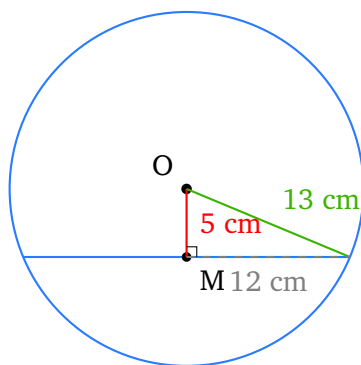


- (A) 27%
(B) 33%
(C) 37%
(D) 43%



- Q9.** Pipe A fills a tank in 12 hours. Pipe B empties the full tank in 8 hours. When both pipes are open simultaneously with the tank completely full, in how many hours will the tank be emptied?
- (A) 24 hours
(B) 20 hours
(C) 16 hours
(D) 28 hours
- Q10.** The sum of ages of three friends A, B, and C is 90 years. B is three times as old as A, and C is 10 years older than A. Find B's age.
- (A) 32 years
(B) 48 years
(C) 16 years
(D) 40 years
- Q11.** A can complete a piece of work in 15 days. B is 50% more efficient than A. In how many days will B alone complete the same work?
- (A) 12 days
(B) 8 days
(C) 10 days
(D) 6 days
- Q12.** A bag contains coins of Rs. 2 and Rs. 5 denominations. The total number of coins is 35 and the total value is Rs. 100. How many Rs. 5 coins are there?
- (A) 5
(B) 7
(C) 8
(D) 10
- Q13.** In a circle of radius 13 cm, a chord is at a perpendicular distance of 5 cm from the centre. Find the length of the chord.





- (A) 24 cm
- (B) 20 cm
- (C) 18 cm
- (D) 22 cm

Q14. A card is drawn at random from a well-shuffled deck of 52 cards. What is the probability that the card drawn is **not** a face card (Jack, Queen, or King)?

- (A) $\frac{9}{13}$
- (B) $\frac{10}{13}$
- (C) $\frac{3}{13}$
- (D) $\frac{11}{13}$

Q15. A shirt is marked at Rs. 1,200. A shopkeeper offers two successive discounts of 20% and 10%. What is the final selling price?

- (A) Rs. 840
- (B) Rs. 852
- (C) Rs. 864
- (D) Rs. 876

Q16. How many diagonals does a regular octagon (8 sides) have?

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



DETAILED SOLUTIONS

Sol. 1.

Solution**Topic: Taxation / Income Tax Slabs**

Tax on income from Rs. 2,50,001 to Rs. 5,00,000 at 5%:
 $= 5\% \text{ of } 2,50,000 = \text{Rs. } 12,500.$

Tax on income above Rs. 5,00,000 at 20%:

Taxable amount $= 5,80,000 - 5,00,000 = \text{Rs. } 80,000.$
 $= 20\% \text{ of } 80,000 = \text{Rs. } 16,000.$

Total income tax $= 12,500 + 16,000 = \text{Rs. } 28,500.$

Answer: (D) [Go Back to Q 1](#)

Sol. 2.

Solution**Topic: Statistics / Combined Mean**

Total score of Group X $= 20 \times 70 = 1400.$

Total score of Group Y $= 30 \times 80 = 2400.$

Combined mean $= \frac{1400 + 2400}{20 + 30} = \frac{3800}{50} = 76.$

Answer: (A) [Go Back to Q 2](#)

Sol. 3.

Solution**Topic: Compound Interest / Half-Yearly Compounding**

Half-yearly rate $= \frac{10\%}{2} = 5\%;$ number of periods $= 2.$

Amount $= 8000 \times (1.05)^2 = 8000 \times 1.1025 = \text{Rs. } 8,820.$

Compound Interest $= 8820 - 8000 = \text{Rs. } 820.$

Answer: (B) [Go Back to Q 3](#)

Sol. 4.

Solution**Topic: Time, Speed and Distance / Train crossing Platform**

Total distance to be covered $= \text{length of train} + \text{length of platform}$
 $= 150 + 250 = 400 \text{ m.}$



$$\text{Speed} = 72 \text{ km/h} = 72 \times \frac{1000}{3600} = 20 \text{ m/s.}$$

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{400}{20} = 20 \text{ seconds.}$$

Answer: (C) [Go Back to Q 4](#)

Sol. 5.

Solution

Topic: Number System / HCF and LCM

For any two numbers: $\text{Number}_1 \times \text{Number}_2 = \text{HCF} \times \text{LCM}$.

Product of numbers = $12 \times 180 = 2160$.

Other number = $\frac{2160}{36} = 60$.

Answer: (D) [Go Back to Q 5](#)

Sol. 6.

Solution

Topic: Algebra / Quadratic Roots — Vieta's Formulas

For $2x^2 - 5x + 3 = 0$: by Vieta's formulas,

$$\alpha + \beta = \frac{5}{2}, \quad \alpha\beta = \frac{3}{2}.$$

$$\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta = \frac{25}{4} - 2 \cdot \frac{3}{2} = \frac{25}{4} - 3 = \frac{25}{4} - \frac{12}{4} = \frac{13}{4}.$$

Answer: (A) [Go Back to Q 6](#)

Sol. 7.

Solution

Topic: Mensuration / Total Surface Area of Solid Hemisphere

TSA of a solid hemisphere = curved surface area + flat base

$$= 2\pi r^2 + \pi r^2 = 3\pi r^2.$$

$$= 3 \times \frac{22}{7} \times 7^2 = 3 \times \frac{22}{7} \times 49 = 3 \times 22 \times 7 = 462 \text{ cm}^2.$$

Answer: (B) [Go Back to Q 7](#)

Sol. 8.



Solution**Topic: Data Interpretation / Bar Chart — Percentage Share**

Sales: P = 40, Q = 25, R = 55, S = 30 (all in thousands of units).

Total sales = 40 + 25 + 55 + 30 = 150 thousand units.

$$R's \text{ percentage} = \frac{55}{150} \times 100 = 36.\bar{6}\% \approx 37\%.$$

Answer: (C) [Go Back to Q 8](#)

Sol. 9.

Solution**Topic: Pipes and Cisterns / Net Drain Rate**Fill rate of Pipe A = $\frac{1}{12}$ tank/hour.Drain rate of Pipe B = $\frac{1}{8}$ tank/hour.

$$\text{Net drain rate (both open)} = \frac{1}{8} - \frac{1}{12} = \frac{3}{24} - \frac{2}{24} = \frac{1}{24} \text{ tank/hour.}$$

$$\text{Time to empty the full tank} = \frac{1}{1/24} = 24 \text{ hours.}$$

Answer: (A) [Go Back to Q 9](#)

Sol. 10.

Solution**Topic: Linear Equations / Age Problems**Let A's age = x years.Then B's age = $3x$ and C's age = $x + 10$.

$$\text{Sum: } x + 3x + (x + 10) = 90 \Rightarrow 5x + 10 = 90 \Rightarrow 5x = 80 \Rightarrow x = 16.$$

$$B's \text{ age} = 3 \times 16 = 48 \text{ years.}$$

Answer: (B) [Go Back to Q 10](#)

Sol. 11.

Solution**Topic: Work and Efficiency / Comparative Efficiency**A's rate = $\frac{1}{15}$ work/day.

$$B \text{ is } 50\% \text{ more efficient than A, so B's rate} = \frac{3}{2} \times \frac{1}{15} = \frac{3}{30} = \frac{1}{10} \text{ work/day.}$$

$$B \text{ alone completes the work in } \frac{1}{1/10} = 10 \text{ days.}$$



Answer: (C) [Go Back to Q 11](#)

Sol. 12.

Solution

Topic: Linear Equations / Coin Denomination Problem

Let number of Rs. 5 coins = x .

Then number of Rs. 2 coins = $35 - x$.

Total value: $5x + 2(35 - x) = 100$

$5x + 70 - 2x = 100$

$3x = 30 \Rightarrow x = 10$.

Number of Rs. 5 coins = 10.

Answer: (D) [Go Back to Q 12](#)

Sol. 13.

Solution

Topic: Geometry / Chord Length using Pythagoras

The perpendicular from the centre bisects the chord.

In right triangle OMA: $OM = 5$ cm (given), $OA = r = 13$ cm.

By Pythagoras:

$$AM = \sqrt{OA^2 - OM^2} = \sqrt{13^2 - 5^2} = \sqrt{169 - 25} = \sqrt{144} = 12 \text{ cm.}$$

Full chord length = $2 \times AM = 2 \times 12 = 24$ cm.

Answer: (A) [Go Back to Q 13](#)

Sol. 14.

Solution

Topic: Probability / Complementary Events

Total cards in deck = 52.

Face cards (J, Q, K) per suit = 3; total face cards = $3 \times 4 = 12$.

Non-face cards = $52 - 12 = 40$.

$$P(\text{not a face card}) = \frac{40}{52} = \frac{10}{13} = \frac{10}{13}.$$

Answer: (B) [Go Back to Q 14](#)

Sol. 15.



Solution**Topic: Profit and Loss / Successive Discounts**

Marked price = Rs. 1,200.

After first discount of 20%: $1200 \times 0.80 = \text{Rs. } 960$.

After second discount of 10%: $960 \times 0.90 = \text{Rs. } 864$.

Answer: (C) [Go Back to Q 15](#)

Sol. 16.

Solution**Topic: Geometry / Diagonals of a Polygon**

Number of diagonals in an n -sided polygon = $\frac{n(n-3)}{2}$.

For an octagon ($n = 8$):

$$\frac{8 \times (8-3)}{2} = \frac{8 \times 5}{2} = \frac{40}{2} = 20.$$

Answer: (D) [Go Back to Q 16](#)

ANSWER KEY

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

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