MAHCET Quantitative Aptitude

Sample Paper – 1

Duration: 38 Minutes **Maximum Marks: 50**

Instructions

- This paper contains **50** Multiple Choice Questions (Single Correct Answer), modelled on the Quantitative Aptitude section of **MAH-MBA CET**.
- Each correct answer carries **+1 mark**. There is **no negative marking** for incorrect or unattempted answers.
- Only **one** option is correct. Choose carefully.
- Syllabus: MAH-MBA CET Quantitative Aptitude — arithmetic, algebra, data interpretation, geometry & mensuration, number series, permutation & combination, and probability.
- This is a **CBT (Computer-Based Test)**. Personal calculators, mobile phones, and electronic gadgets are strictly prohibited. A simple on-screen calculator is provided in the test interface.

Q1. **Questions 1–5:** The following table shows the quarterly sales (in Rs. lakh) of five products of a company. Study the data carefully and answer the questions that follow.

Product	Q1	Q2	Q3	Q4
Alpha	120	150	180	200
Beta	80	100	90	120
Gamma	200	180	210	190
Delta	60	70	80	90
Epsilon	150	160	140	170

What is the total annual sales (in Rs. lakh) of the product Alpha?

(A) 650

(B) 620

(C) 680

(D) 600

Q2. In which quarter was the sales of Beta the highest?

(A) Q1

(B) Q4

(C) Q2

(D) Q3

Q3. By what percentage did the sales of Delta increase from Q1 to Q4?

(A) 33.3%

(B) 40%

(C) 50%

(D) 25%

Q4. What is the average quarterly sales (in Rs. lakh) of Gamma?

(A) 180

(B) 200

(C) 210

(D) 195

Q5. By how many lakh rupees do Epsilon's Q4 sales exceed its Q2 sales?

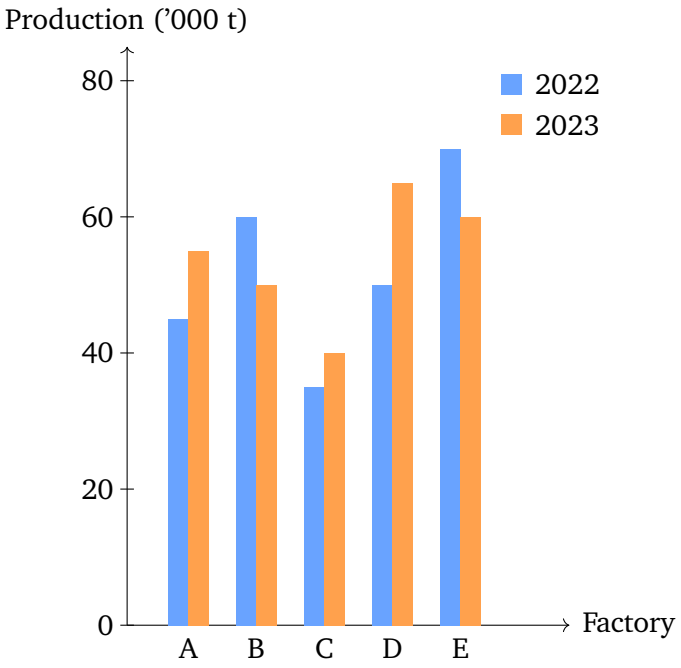
(A) 10

(B) 20

(C) 30

(D) 15

Q6. **Questions 6–10:** The grouped bar chart below shows the annual production (in thousand tonnes) of five factories (A–E) for the years 2022 and 2023.



What is the total production (in thousand tonnes) of all five factories in the year 2022?

(A) 280

(B) 260

(C) 270

(D) 250

Q7. Which factory showed the highest percentage increase in production from 2022 to 2023?

(A) Factory A

(B) Factory B

(C) Factory D

(D) Factory E

Q8. What is the ratio of total production in 2022 to total production in 2023?

(A) 27:26

(B) 13:14

(C) 25:27

(D) 26:27

Q9. What is the average production (in thousand tonnes) of Factory A over both years?

(A) 50

(B) 45

(C) 55

(D) 48

Q10. What is the combined production (in thousand tonnes) of Factories B and E in 2023?

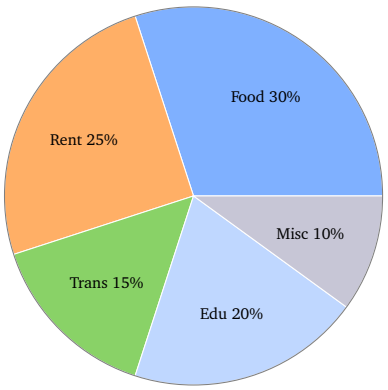
(A) 100

(B) 110

(C) 120

(D) 130

Q11. **Questions 11–15:** The pie chart below shows the monthly household expenditure of a family whose total monthly income is Rs. 60,000. Study the chart and answer the questions.



How much does the family spend on Food per month?

(A) Rs. 15,000

(B) Rs. 12,000

(C) Rs. 18,000

(D) Rs. 20,000

Q12. What is the ratio of expenditure on Transport to Education?

(A) 2:3

(B) 1:2

(C) 4:5

(D) 3:4

Q13. If the family's income increases by 20% and they maintain the same percentage distribution, what will be their monthly expenditure on Rent?

(A) Rs. 18,000

(B) Rs. 15,000

(C) Rs. 20,000

(D) Rs. 12,000

Q14. The Miscellaneous expenditure is what percentage less than Education expenditure?

(A) 40%

(B) 50%

(C) 33.3%

(D) 60%

Q15. The combined expenditure on Food and Transport is what fraction of the total expenditure?

(A) $\frac{3}{5}$

(B) $\frac{7}{20}$

(C) $\frac{9}{20}$

(D) $\frac{1}{2}$

Q16. A shopkeeper marks up the cost price of goods by 40% and then gives a discount of 20% on the marked price. What is the profit percentage?

(A) 8%

(B) 10%

(C) 15%

(D) 12%

Q17. Find the Simple Interest on Rs. 16,000 at the rate of 8% per annum for 5 years.

(A) Rs. 6,400

(B) Rs. 5,400

(C) Rs. 7,200

(D) Rs. 4,800

Q18. A train 240 m long crosses a pole in 12 seconds. How long will it take the same train to cross a platform 360 m long?

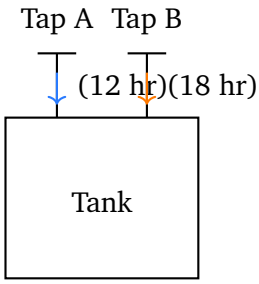
(A) 24 sec

(B) 30 sec

(C) 36 sec

(D) 18 sec

Q19. Tap A can fill a tank in 12 hours and Tap B can fill the same tank in 18 hours. If both taps are opened together, how long will they take to fill the tank?



(A) 6 hr 30 min

(B) 7 hr

(C) 7 hr 12 min

(D) 8 hr

Q20. A sum of Rs. 84,000 is to be divided among A, B, and C in the ratio 3:4:5. What is B's share?

(A) Rs. 21,000

(B) Rs. 35,000

(C) Rs. 42,000

(D) Rs. 28,000

Q21. The average of 15 numbers is 42. If 5 is added to each of the numbers, what will be the new average?

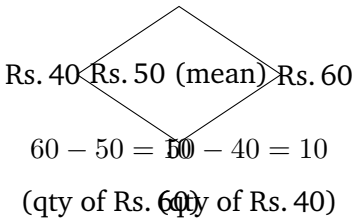
(A) 47

(B) 45

(C) 50

(D) 48

Q22. Rice costing Rs. 40 per kg is mixed with rice costing Rs. 60 per kg. In what ratio should they be mixed so that the blended mixture costs Rs. 50 per kg?



(A) 2:1

(B) 1:1

(C) 1:2

(D) 3:2

Q23. A invests Rs. 24,000 for 8 months and B invests Rs. 18,000 for 12 months in a business. In what ratio should they share the profit?

(A) 4:3

(B) 3:4

(C) 8:9

(D) 9:8

Q24. The population of a town grows by 10% in the first year and 20% in the second year. What is the net percentage increase in population over the two years?

(A) 30%

(B) 22%

(C) 28%

(D) 32%

Q25. A book is sold at Rs. 480 after a discount of 20%. What is the marked price of the book?

(A) Rs. 600

(B) Rs. 560

(C) Rs. 640

(D) Rs. 520

Q26. Find the Simple Interest on Rs. 8,000 at the rate of 5% per annum for 3 years.

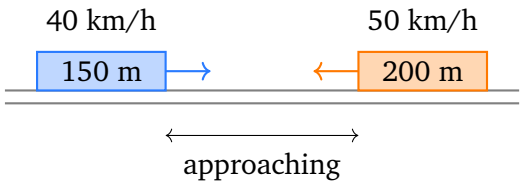
(A) Rs. 1,000

(B) Rs. 1,200

(C) Rs. 1,500

(D) Rs. 900

Q27. Two trains of lengths 150 m and 200 m are travelling towards each other at speeds of 40 km/h and 50 km/h respectively. How long will they take to cross each other completely?



(A) 12 sec

(B) 10 sec

(C) 14 sec

(D) 16 sec

Q28. 15 men can finish a job in 12 days. How many men are required to finish the same job in 9 days?

(A) 16

(B) 18

(C) 24

(D) 20

Q29. If $x - y = 3$ and $2x + y = 12$, find the value of $x + y$.

(A) 7

(B) 9

(C) 5

(D) 6

Q30. A person's monthly income and expenditure are in the ratio 5:4. If his monthly savings are Rs. 6,000, what is his monthly income?

(A) Rs. 24,000

(B) Rs. 30,000

(C) Rs. 36,000

(D) Rs. 25,000

Q31. The average age of 5 persons is 32 years. If a 6th person joins the group, the average age becomes 30 years. What is the age of the 6th person?

(A) 18

(B) 22

(C) 20

(D) 25

Q32. In an election, 2,200 votes were cast out of which 200 were declared invalid. Candidate A secured 55% of the valid votes. How many votes did Candidate A obtain?

(A) 1,000

(B) 1,050

(C) 1,210

(D) 1,100

Q33. A shopkeeper buys an article at 20% below its printed price and sells it at 10% above the printed price. What is his percentage profit?

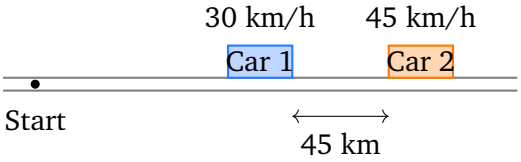
(A) 37.5%

(B) 30%

(C) 25%

(D) 32%

Q34. Two cars start from the same point at the same time and travel in the same direction at speeds of 30 km/h and 45 km/h respectively. What is the distance between them after 3 hours?



(A) 30 km

(B) 45 km

(C) 60 km

(D) 15 km

Q35. A can complete a work in 20 days and B can complete it in 30 days. They work together for 6 days and then A leaves. How many more days will B take to finish the remaining work?

(A) 12 days

(B) 10 days

(C) 15 days

(D) 18 days

Q36. Solve the equations $2x + 3y = 16$ and $3x + 2y = 14$. Find the value of x.

(A) 4

(B) 3

(C) 5

(D) 2

Q37. The sum of two numbers is 25 and their difference is 7. Find the product of the two numbers.

(A) 144

(B) 126

(C) 160

(D) 132

Q38. Find the roots of the quadratic equation $x^2 - 5x + 6 = 0$.

(A) 1 and 6

(B) 2 and 3

(C) 3 and 4

(D) 2 and 4

Q39. The length of a rectangle is 3 cm more than its width. If the area of the rectangle is 54 cm^2, find the perimeter of the rectangle.

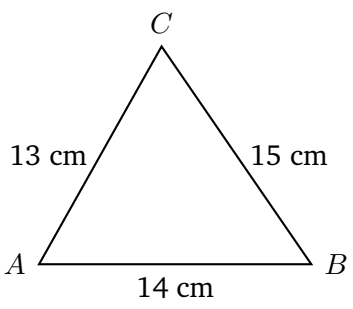
(A) 24 cm

(B) 27 cm

(C) 30 cm

(D) 36 cm

Q40. Find the area of a triangle whose sides are 13 cm, 14 cm, and 15 cm.



(A) 72 cm^2

(B) 78 cm^2

(C) 90 cm^2

(D) 84 cm^2

Q41. The circumference of a circle is 44 cm. Find the area of the circle. (Use $\pi = \frac{22}{7}$)

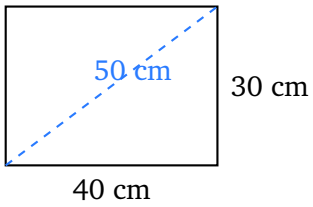
(A) 154 cm^2

(B) 132 cm^2

(C) 176 cm^2

(D) 144 cm^2

Q42. A rectangle has a length of 40 cm and a width of 30 cm. Find the length of its diagonal.



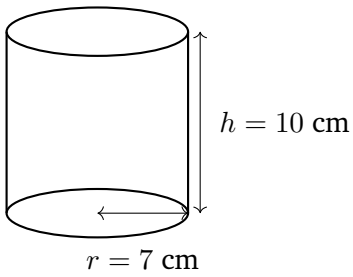
(A) 45 cm

(B) 50 cm

(C) 55 cm

(D) 60 cm

Q43. Find the volume of a cylinder with radius 7 cm and height 10 cm. (Use $\pi = \frac{22}{7}$)



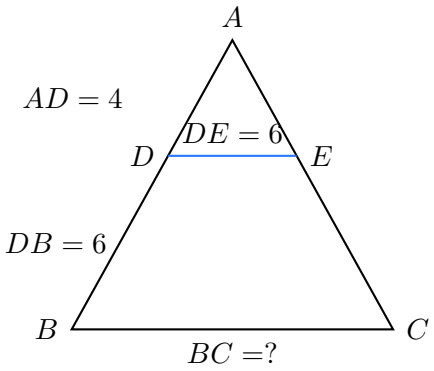
(A) 1,440 cm^3

(B) 1,320 cm^3

(C) 1,540 cm^3

(D) 1,650 cm^3

Q44. In $\triangle ABC$, $DE \parallel BC$ where D is on AB and E is on AC. If $AD = 4$ cm, $DB = 6$ cm and $DE = 6$ cm, find BC.



(A) 10 cm

(B) 12 cm

(C) 18 cm

(D) 15 cm

Q45. Find the next term in the series: $2,\ 6,\ 18,\ 54,\ \ldots$

(A) 162

(B) 108

(C) 144

(D) 180

Q46. Find the next term in the series: $3,\ 7,\ 13,\ 21,\ 31,\ \ldots$

(A) 41

(B) 43

(C) 45

(D) 47

Q47. Identify the wrong term in the series: $1,\ 4,\ 9,\ 16,\ 26,\ 36$

(A) 9

(B) 16

(C) 26

(D) 36

Q48. In how many ways can a committee of 3 persons be formed from a group of 8 persons?

(A) 42

(B) 48

(C) 24

(D) 56

Q49. A bag contains 4 red balls, 3 blue balls, and 2 green balls. If one ball is drawn at random, what is the probability that it is red?

(A) $\frac{4}{9}$

(B) $\frac{1}{3}$

(C) $\frac{2}{9}$

(D) $\frac{5}{9}$

Q50. How many 3-digit numbers can be formed using the digits $\{1, 2, 3, 4, 5\}$ without repetition?

(A) 120

(B) 60

(C) 24

(D) 48

Detailed Solutions

Q1.

Solution

Concept — Data Interpretation: Tables: Reading and summing column values from a data table.

Step 1 — Identify Alpha's quarterly sales: Q1 = Rs. 120 lakh, Q2 = Rs. 150 lakh, Q3 = Rs. 180 lakh, Q4 = Rs. 200 lakh.

Step 2 — Compute total:

$$\text{Total} = 120 + 150 + 180 + 200 = \textbf{650 lakh}$$

Why other options are wrong:

- Option B (620): Incorrectly omits or reduces Q4.
- Option C (680): Uses an inflated Q3 value.
- Option D (600): Undercounts two quarters.

Final Answer: Total annual sales of Alpha = Rs. 650 lakh $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q1

Q2.

Solution

Concept — Data Interpretation: Tables: Identifying the maximum value in a row.

Step 1 — Beta's quarterly sales: Q1 = 80, Q2 = 100, Q3 = 90, Q4 = 120.

Step 2 — Find the maximum: The highest value is **120** lakh, which occurs in **Q4**.

Why other options are wrong:

- Option A (Q1): Sales were only 80 lakh.
- Option C (Q2): Sales were 100 lakh, not the highest.
- Option D (Q3): Sales were only 90 lakh.

Final Answer: Beta's highest sales quarter = Q4 $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q2

Q3.

Solution

Concept — Percentage Change: $\%$ increase $= \dfrac{\text{New} - \text{Old}}{\text{Old}} \times 100$.

Step 1 — Delta's sales: Q1 $=$ Rs. 60 lakh, Q4 $=$ Rs. 90 lakh.

Step 2 — Calculate % increase:

$$\% \text{ increase} = \frac{90 - 60}{60} \times 100 = \frac{30}{60} \times 100 = \mathbf{50\%}$$

Why other options are wrong:

- Option A (33.3%): Would apply if increase were 20 on base 60, i.e., rise to 80.
- Option B (40%): Corresponds to a rise from 60 to 84.
- Option D (25%): Corresponds to a rise from 60 to 75.

Final Answer: Percentage increase in Delta's sales $= 50\% \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q3

Q4.

Solution

Concept — Arithmetic Mean: Average $= \dfrac{\text{Sum of values}}{\text{Number of values}}$.

Step 1 — Gamma's quarterly sales: Q1 $=$ 200, Q2 $=$ 180, Q3 $=$ 210, Q4 $=$ 190.

Step 2 — Compute average:

$$\text{Average} = \frac{200 + 180 + 210 + 190}{4} = \frac{780}{4} = \mathbf{195 \text{ lakh}}$$

Why other options are wrong:

- Option A (180): Only Q2 value; not the average.
- Option B (200): Only Q1 value.
- Option C (210): Only Q3 value (highest quarter).

Final Answer: Average quarterly sales of Gamma $=$ Rs. 195 lakh $\Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q4

Q5.

Solution

Concept — Data Interpretation: Difference: Subtracting two values from a table.

Step 1 — Epsilon's relevant sales: Q2 = Rs. 160 lakh, Q4 = Rs. 170 lakh.

Step 2 — Calculate difference:

$$170 - 160 = \textbf{10 lakh}$$

Why other options are wrong:

- Option B (20): Incorrect subtraction (e.g., confusing Q3 and Q1).
- Option C (30): Overestimates the gap.
- Option D (15): No such difference exists in the data.

Final Answer: Epsilon's Q4 exceeds Q2 by Rs. 10 lakh $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q5

Q6.

Solution

Concept — Data Interpretation: Bar Charts: Reading bar heights and summing.

Step 1 — 2022 production for each factory (thousand tonnes): A = 45, B = 60, C = 35, D = 50, E = 70.

Step 2 — Compute total:

$$45 + 60 + 35 + 50 + 70 = \textbf{260 thousand tonnes}$$

Why other options are wrong:

- Option A (280): Overestimates; possibly reads 2023 value for one factory.
- Option C (270): Total for 2023 (55+50+40+65+60).
- Option D (250): Undercounts by 10.

Final Answer: Total 2022 production = 260 thousand tonnes $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q6

Q7.

Solution

Concept — Percentage Increase: $\%$ increase $= \dfrac{\text{New} - \text{Old}}{\text{Old}} \times 100$.

Step 1 — Compute % increase for each factory:

- A: $(55-45)/45 \times 100 \approx 22.2\%$
- B: $(50-60)/60 \times 100 = -16.7\%$ (decrease)
- C: $(40-35)/35 \times 100 \approx 14.3\%$
- D: $(65-50)/50 \times 100 = 30\%$
- E: $(60-70)/70 \times 100 \approx -14.3\%$ (decrease)

Step 2 — Identify the highest: Factory D has the highest percentage increase at **30%**.

Why other options are wrong:

- Option A (Factory A): Only 22.2% increase.
- Option B (Factory B): Production decreased.
- Option D (Factory E): Production decreased.

Final Answer: Highest % increase = Factory D $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q7

Q8.

Solution

Concept — Ratio: Expressing two totals as a simplified ratio.

Step 1 — Total 2022 production: $45 + 60 + 35 + 50 + 70 = 260$ thousand tonnes.

Step 2 — Total 2023 production: $55 + 50 + 40 + 65 + 60 = 270$ thousand tonnes.

Step 3 — Simplify the ratio:

$$260 : 270 = 26 : 27$$

Why other options are wrong:

- Option A (27:26): Inverted ratio (2023:2022).
- Option B (13:14): Incorrect simplification.
- Option C (25:27): Incorrect; 260 does not simplify to 25.

Final Answer: Ratio of 2022 to 2023 production $= 26 : 27 \Rightarrow$ D

Answer: (D) Go Back to Q8

Q9.

Solution

Concept — Arithmetic Mean: Average of two values.

Step 1 — Factory A's production: 2022 $= 45$ thousand tonnes, 2023 $= 55$ thousand tonnes.

Step 2 — Calculate average:

$$\text{Average} = \frac{45 + 55}{2} = \frac{100}{2} = \textbf{50 thousand tonnes}$$

Why other options are wrong:

- Option B (45): Only the 2022 value.
- Option C (55): Only the 2023 value.
- Option D (48): Not obtainable from the given data.

Final Answer: Average production of Factory A $= 50$ thousand tonnes $\Rightarrow$ A

Answer: (A) Go Back to Q9

Q10.

Solution

Concept — Data Interpretation: Addition: Summing two bar values.

Step 1 — 2023 production: Factory B $= 50$ thousand tonnes; Factory E $= 60$ thousand tonnes.

Step 2 — Combined total:

$$50 + 60 = \textbf{110 thousand tonnes}$$

Why other options are wrong:

- Option A (100): Uses 2022 value for Factory E (70) instead of 2023 (60), giving 50+50=100 if B is used twice.
- Option C (120): Possible confusion with 2022 values (60+60).

- Option D (130): Overstates one factory's production.

Final Answer: Combined 2023 production of B and E $= 110$ thousand tonnes $\Rightarrow$ B

Answer: (B) Go Back to Q10

Q11.

Solution

Concept — Data Interpretation: Pie Chart: Converting a percentage to a monetary amount.

Step 1 — Food percentage from chart: Food $= 30\%$.

Step 2 — Monthly Food expenditure:

$$30\% \times 60{,}000 = \frac{30}{100} \times 60{,}000 = \textbf{Rs. 18,000}$$

Why other options are wrong:

- Option A (Rs. 15,000): Corresponds to Rent (25%).
- Option B (Rs. 12,000): Corresponds to Education (20%).
- Option D (Rs. 20,000): No category has this value.

Final Answer: Monthly Food expenditure $=$ Rs. 18,000 $\Rightarrow$ C

Answer: (C) Go Back to Q11

Q12.

Solution

Concept — Ratio: Comparing two expenditure categories.

Step 1 — Expenditure values: Transport $=$ Rs. 9,000 (15%), Education $=$ Rs. 12,000 (20%).

Step 2 — Simplify the ratio:

$$9{,}000 : 12{,}000 = 9 : 12 = \textbf{3:4}$$

Why other options are wrong:

- Option A (2:3): Would require Transport = 8,000 and Education = 12,000.
- Option B (1:2): Would require Transport = 6,000, i.e., 10% (that is Misc).
- Option C (4:5): Would require Transport = 16,000 and Education = 20,000.

Final Answer: Ratio of Transport to Education $= 3 : 4 \Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q12

Q13.

Solution

Concept — Percentage of a new base: Apply the same percentage to the increased income.

Step 1 — New monthly income after 20% increase:

$$60{,}000 \times 1.20 = \text{Rs. } 72{,}000$$

Step 2 — Rent at 25% of new income:

$$25\% \times 72{,}000 = \frac{25}{100} \times 72{,}000 = \textbf{Rs. 18,000}$$

Why other options are wrong:

- Option B (Rs. 15,000): Old Rent value; does not account for income increase.
- Option C (Rs. 20,000): 25% of Rs. 80,000 (a 33% increase, not 20%).
- Option D (Rs. 12,000): 20% of Rs. 60,000 (applies Education % to old income).

Final Answer: New Rent expenditure $=$ Rs. 18,000 $\Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q13

Q14.

Solution

Concept — Percentage less than: $\%\ \text{less} = \dfrac{\text{Higher} - \text{Lower}}{\text{Higher}} \times 100.$

Step 1 — Values: Education $=$ Rs. 12,000; Misc $=$ Rs. 6,000.

Step 2 — Compute:

$$\%\ \text{less} = \frac{12{,}000 - 6{,}000}{12{,}000} \times 100 = \frac{6{,}000}{12{,}000} \times 100 = \mathbf{50\%}$$

Why other options are wrong:

- Option A (40%): Uses wrong denominator (base of 10,000).
- Option C (33.3%): This is $(6000/18000) \times 100$, using Food as denominator.
- Option D (60%): Overstates the difference.

Final Answer: Misc is 50% less than Education $\Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q14

Q15.

Solution

Concept — Fraction of total: Sum two parts and divide by whole.

Step 1 — Expenditure values: Food $=$ Rs. 18,000; Transport $=$ Rs. 9,000; Total $=$ Rs. 60,000.

Step 2 — Compute fraction:

$$\frac{18{,}000 + 9{,}000}{60{,}000} = \frac{27{,}000}{60{,}000} = \frac{27}{60} = \frac{9}{20}$$

Why other options are wrong:

- Option A $(3/5)$: Would be $36{,}000/60{,}000$; that is Food + Rent.
- Option B $(7/20)$: Corresponds to $21{,}000/60{,}000$ (Transport + Education).
- Option D $(1/2)$: Would require a combined total of Rs. 30,000.

Final Answer: Combined fraction $= \dfrac{9}{20} \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q15

Q16.

Solution

Concept — Profit and Loss with Mark-up and Discount:

$$\text{SP} = \text{MP} \times (1 - \text{discount\%}) \quad ; \quad \text{Profit\%} = \frac{\text{SP} - \text{CP}}{\text{CP}} \times 100$$

Step 1 — Let CP = Rs. 100. Mark-up $= 40\%$, so MP $= 100 \times 1.40 =$ Rs. 140.

Step 2 — Apply 20% discount:

$$\text{SP} = 140 \times 0.80 = \text{Rs. } 112$$

Step 3 — Profit percentage:

$$\text{Profit\%} = \frac{112 - 100}{100} \times 100 = \mathbf{12\%}$$

Why other options are wrong:

- Option A (8%): Incorrectly subtracts 40%−20%×40% on CP.
- Option B (10%): Applies a net discount of 20% to the mark-up percentage only.
- Option C (15%): Does not correctly account for the compounding of mark-up and discount.

Final Answer: Profit percentage $= 12\% \Rightarrow$ D

Answer: (D) Go Back to Q16

Q17.

Solution

Concept — Simple Interest:

$$\text{SI} = \frac{P \times R \times T}{100}$$

Given: $P =$ Rs. 16,000, $R = 8\%$ p.a., $T = 5$ years.

Calculation:

$$\text{SI} = \frac{16{,}000 \times 8 \times 5}{100} = \frac{6{,}40{,}000}{100} = \mathbf{Rs.\ 6{,}400}$$

Why other options are wrong:

- Option B (Rs. 5,400): Uses $R = 6.75\%$ or incorrect values.
- Option C (Rs. 7,200): Uses $T = 6$ years instead of 5.
- Option D (Rs. 4,800): Uses $T = 3.75$ years or a lower rate.

Final Answer: Simple Interest $=$ Rs. 6,400 $\Rightarrow$ A

Answer: (A) Go Back to Q17

Q18.

Solution

Concept — Trains and Speed:

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} \quad ; \quad \text{Time} = \frac{\text{Length of train} + \text{Length of obstacle}}{\text{Speed}}$$

Step 1 — Find the speed of the train: The train (240 m) crosses a pole in 12 sec, so:

$$\text{Speed} = \frac{240}{12} = 20 \text{ m/s}$$

Step 2 — Time to cross a 360 m platform:

$$\text{Time} = \frac{240 + 360}{20} = \frac{600}{20} = \textbf{30 seconds}$$

Why other options are wrong:

- Option A (24 sec): Only accounts for the train's length (240/20+240/20 arithmetic error).
- Option C (36 sec): Adds an extra incorrect length to the numerator.
- Option D (18 sec): Uses only the platform length (360/20).

Final Answer: Time to cross the platform $= 30$ seconds $\Rightarrow$ B

Answer: (B) Go Back to Q18

Q19.

Solution

Concept — Pipes and Cisterns: Work done per hour = sum of individual rates.

Step 1 — Individual rates: Tap A fills $\frac{1}{12}$ of the tank per hour; Tap B fills $\frac{1}{18}$ per hour.

Step 2 — Combined rate:

$$\frac{1}{12}+\frac{1}{18}=\frac{3}{36}+\frac{2}{36}=\frac{5}{36}\text{ tank per hour}$$

Step 3 — Time to fill the tank:

$$\text{Time}=\frac{36}{5}=7.2\text{ hours}=\textbf{7 hours 12 minutes}$$

Why other options are wrong:

- Option A (6 hr 30 min): Uses an incorrect combined rate.
- Option B (7 hr): Rounds down incorrectly.
- Option D (8 hr): Overestimates the time.

Final Answer: Time to fill the tank = 7 hr 12 min $\Rightarrow$ C

Answer: (C) Go Back to Q19

Q20.

Solution

Concept — Ratio and Proportion: Share $=\frac{\text{person's ratio part}}{\text{total parts}}\times$ total sum.

Step 1 — Total parts: $3+4+5=12$ parts.

Step 2 — B's share (4 parts):

$$B=\frac{4}{12}\times 84{,}000=\frac{1}{3}\times 84{,}000=\textbf{Rs. 28,000}$$

Why other options are wrong:

- Option A (Rs. 21,000): A's share (3 parts).
- Option B (Rs. 35,000): C's share (5 parts).
- Option C (Rs. 42,000): Half of the total, not B's share.

Final Answer: B's share $=$ Rs. 28,000 $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q20

Q21.

Solution

Concept — Effect on Average: If a constant is added to every number in a set, the average increases by the same constant.

Given: Average of 15 numbers $= 42$. Each number increased by 5.

New average:

$$42 + 5 = \mathbf{47}$$

Why other options are wrong:

- Option B (45): Adds only 3 instead of 5.
- Option C (50): Adds 8 incorrectly.
- Option D (48): Adds 6 incorrectly.

Final Answer: New average $= 47 \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q21

Q22.

Solution

Concept — Alligation Rule:

$$\text{Ratio} = \frac{\text{Costlier price} - \text{Mean price}}{\text{Mean price} - \text{Cheaper price}}$$

Step 1 — Apply alligation: Cheaper (Rs. 40), Costlier (Rs. 60), Mean (Rs. 50).

$$\text{Deviation of cheaper from mean} = 50 - 40 = 10$$

$$\text{Deviation of costlier from mean} = 60 - 50 = 10$$

Step 2 — Required ratio (cheaper : costlier):

$$= 10 : 10 = \mathbf{1:1}$$

Why other options are wrong:

- Option A (2:1): The mean is not equidistant from the two prices if ratio is 2:1.
- Option C (1:2): Inverted logic applied incorrectly.
- Option D (3:2): Not derivable from these values.

Final Answer: Mixing ratio $= 1 : 1 \Rightarrow$ B

Answer: (B) Go Back to Q22

Q23.

Solution

Concept — Partnership Profit Ratio:

$$\text{Profit ratio} = \text{Capital}_A \times \text{Time}_A : \text{Capital}_B \times \text{Time}_B$$

Step 1 — Compute equivalent capitals:

$$A = 24{,}000 \times 8 = 1{,}92{,}000$$

$$B = 18{,}000 \times 12 = 2{,}16{,}000$$

Step 2 — Simplify ratio:

$$1{,}92{,}000 : 2{,}16{,}000 = 192 : 216 = \mathbf{8:9}$$

Why other options are wrong:

- Option A (4:3): Ratio of capitals alone $(24{,}000 : 18{,}000)$, ignoring time.
- Option B (3:4): Inverted capital ratio.
- Option D (9:8): Inverted correct ratio.

Final Answer: Profit ratio of A to B $= 8 : 9 \Rightarrow$ C

Answer: (C) Go Back to Q23

Q24.

Solution

Concept — Successive Percentage Increase:

$$\text{Net \% increase} = \left(1+\frac{r_1}{100}\right)\left(1+\frac{r_2}{100}\right) - 1 \text{ (expressed as \%)}$$

Step 1 — Apply successive growth:

$$1.10 \times 1.20 = 1.32$$

Step 2 — Net percentage increase:

$$(1.32 - 1) \times 100 = \mathbf{32\%}$$

Why other options are wrong:

- Option A (30%): Simple addition of 10% + 20% (ignores compounding).
- Option B (22%): Incorrect calculation.
- Option C (28%): Off by the compounding cross-term $10\% \times 20\% = 2\%$.

Final Answer: Net percentage increase $= 32\% \Rightarrow$ D

Answer: (D) Go Back to Q24

Q25.

Solution

Concept — Marked Price from Selling Price and Discount:

$$\text{SP} = \text{MP} \times \left(1 - \frac{\text{Discount\%}}{100}\right) \implies \text{MP} = \frac{\text{SP}}{1 - \text{Discount\%}/100}$$

Given: SP $=$ Rs. 480, Discount $= 20\%$.

Calculation:

$$\text{MP} = \frac{480}{0.80} = \mathbf{Rs.\ 600}$$

Why other options are wrong:

- Option B (Rs. 560): Incorrectly adds 20% of 480 to 480 ($480 \times 1.20 = 576$; not matching either).

- Option C (Rs. 640): Applies incorrect fraction ($480/0.75$).
- Option D (Rs. 520): Adds a fixed Rs. 40 discount amount.

Final Answer: Marked price = Rs. 600 $\Rightarrow$ A

Answer: (A) Go Back to Q25

Q26.

Solution

Concept — Simple Interest:

$$\text{SI} = \frac{P \times R \times T}{100}$$

Given: P = Rs. 8,000, $R = 5\%$ p.a., $T = 3$ years.

Calculation:

$$\text{SI} = \frac{8{,}000 \times 5 \times 3}{100} = \frac{1{,}20{,}000}{100} = \textbf{Rs. 1,200}$$

Why other options are wrong:

- Option A (Rs. 1,000): Uses $T = 2.5$ years.
- Option C (Rs. 1,500): Uses $R = 6.25\%$ or $T = 3.75$ years.
- Option D (Rs. 900): Uses $R = 3.75\%$ or $T = 2.25$ years.

Final Answer: Simple Interest = Rs. 1,200 $\Rightarrow$ B

Answer: (B) Go Back to Q26

Q27.

Solution

Concept — Relative Speed (Opposite Directions):

$$\text{Relative speed} = v_1 + v_2 \quad ; \quad \text{Time} = \frac{L_1 + L_2}{\text{Relative speed}}$$

Step 1 — Relative speed:

$$40 + 50 = 90 \text{ km/h} = 90 \times \frac{1000}{3600} = 25 \text{ m/s}$$

Step 2 — Total distance to cover: $L_1 + L_2 = 150 + 200 = 350$ m.

Step 3 — Time:

$$\text{Time} = \frac{350}{25} = \textbf{14 seconds}$$

Why other options are wrong:

- Option A (12 sec): Uses only 300 m total length.
- Option B (10 sec): Uses only 250 m or a higher relative speed.
- Option D (16 sec): Uses 400 m as total length.

Final Answer: Time to cross $= 14$ seconds $\Rightarrow$ C

Answer: (C) Go Back to Q27

Q28.

Solution

Concept — Work and Men (Inverse Proportion):

$$M_1 \times D_1 = M_2 \times D_2$$

Given: $M_1 = 15$, $D_1 = 12$, $D_2 = 9$.

Calculation:

$$M_2 = \frac{M_1 \times D_1}{D_2} = \frac{15 \times 12}{9} = \frac{180}{9} = \textbf{20 men}$$

Why other options are wrong:

- Option A (16): Incorrect arithmetic.
- Option B (18): Applies an incorrect ratio.
- Option C (24): Uses $D_2 = 7.5$ (wrong target days).

Final Answer: Men required $= 20 \Rightarrow$ D

Answer: (D) Go Back to Q28

Q29.

Solution

Concept — Simultaneous Linear Equations: Solve by addition or substitution.

Step 1 — Given equations:

$$x - y = 3 \quad \cdots(1)$$

$$2x + y = 12 \quad \cdots(2)$$

Step 2 — Add (1) and (2):

$$3x = 15 \implies x = 5$$

Step 3 — Find y: From (1): $y = x - 3 = 5 - 3 = 2$.

Step 4 — Find $x + y$:

$$x + y = 5 + 2 = \mathbf{7}$$

Why other options are wrong:

- Option B (9): Incorrect; $x + y = 9$ would require $x = 6, y = 3$, which does not satisfy both equations.
- Option C (5): That is only x.
- Option D (6): Off by one; does not satisfy the system.

Final Answer: $x + y = 7 \Rightarrow$ A

Answer: (A) Go Back to Q29

Q30.

Solution

Concept — Ratio and Savings: Income − Expenditure = Savings = 1 part of ratio.

Step 1 — Identify the ratio: Income : Expenditure $= 5 : 4$, so savings $= 5 - 4 = 1$ part.

Step 2 — Value of 1 part: Savings = Rs. 6,000, so 1 part = Rs. 6,000.

Step 3 — Monthly income:

$$\text{Income} = 5 \times 6{,}000 = \textbf{Rs. 30,000}$$

Why other options are wrong:

- Option A (Rs. 24,000): That is the expenditure ($4 \times 6{,}000$).
- Option C (Rs. 36,000): Would imply savings $= 6{,}000$ with a 6:5 ratio.
- Option D (Rs. 25,000): Does not align with the given ratio.

Final Answer: Monthly income $=$ Rs. 30,000 $\Rightarrow$ B

Answer: (B) Go Back to Q30

Q31.

Solution

Concept — Average and New Member:

$$\text{Age of 6th person} = (\text{New average} \times \text{New count}) - (\text{Old average} \times \text{Old count})$$

Calculation:

$$= (30 \times 6) - (32 \times 5) = 180 - 160 = \textbf{20 years}$$

Why other options are wrong:

- Option A (18): Would give a new average of $(160 + 18)/6 = 29.67$.
- Option B (22): Would give a new average of $(160 + 22)/6 = 30.33$.
- Option D (25): Would give a new average of $(160 + 25)/6 = 30.83$.

Final Answer: Age of 6th person $= 20$ years $\Rightarrow$ C

Answer: (C) Go Back to Q31

Q32.

Solution

Concept — Percentage of Valid Votes:

Step 1 — Compute valid votes: Total $= 2{,}200$; Invalid $= 200$; Valid $= 2{,}200 - 200 = 2{,}000$.

Step 2 — Candidate A's votes:

$$55\% \times 2{,}000 = \frac{55}{100} \times 2{,}000 = \mathbf{1{,}100}$$

Why other options are wrong:

- Option A (1,000): 50% of valid votes.
- Option B (1,050): 52.5% of valid votes.
- Option C (1,210): 55% of total votes including invalid (2200).

Final Answer: Candidate A's votes $= 1{,}100 \Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q32

Q33.

Solution

Concept — Profit Percentage when CP and SP are relative to printed price:

Step 1 — Let printed price = Rs. 100 (base). CP $= 100 - 20\% =$ Rs. 80 (bought at 20% below printed price). SP $= 100 + 10\% =$ Rs. 110 (sold at 10% above printed price).

Step 2 — Profit percentage:

$$\text{Profit\%} = \frac{110 - 80}{80} \times 100 = \frac{30}{80} \times 100 = \mathbf{37.5\%}$$

Why other options are wrong:

- Option B (30%): Simple addition of 20% and 10%, not on the correct base.
- Option C (25%): Uses wrong CP or SP values.
- Option D (32%): Incorrect calculation of the profit base.

Final Answer: Profit percentage $= 37.5\% \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q33

Q34.

Solution

Concept — Relative Speed (Same Direction):

$$\text{Distance apart} = (\text{Faster speed} - \text{Slower speed}) \times \text{Time}$$

Calculation:

$$\text{Distance} = (45 - 30) \times 3 = 15 \times 3 = \mathbf{45\ km}$$

Why other options are wrong:

- Option A (30 km): 15×2 hours (uses $T = 2$).
- Option C (60 km): 15×4 hours (uses $T = 4$).
- Option D (15 km): Only the speed difference, not multiplied by time.

Final Answer: Distance between the cars $= 45$ km $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q34

Q35.

Solution

Concept — Work Together Then One Leaves:

Step 1 — Combined work rate of A and B:

$$\frac{1}{20} + \frac{1}{30} = \frac{3}{60} + \frac{2}{60} = \frac{5}{60} = \frac{1}{12} \text{ per day}$$

Step 2 — Work done in 6 days together:

$$6 \times \frac{1}{12} = \frac{1}{2}$$

Step 3 — Remaining work after A leaves:

$$1 - \frac{1}{2} = \frac{1}{2}$$

Step 4 — Days for B alone to finish:

$$\frac{1/2}{1/30} = \frac{1}{2} \times 30 = \mathbf{15\ days}$$

Why other options are wrong:

- Option A (12 days): Ignores the initial 6 days of joint work properly.
- Option B (10 days): Assumes less remaining work.
- Option D (18 days): Overestimates remaining work.

Final Answer: B takes **15 more days** to finish $\Rightarrow$ C

Answer: (C) Go Back to Q35

Q36.

Solution

Concept — Simultaneous Equations (Elimination Method):

Given:

$$2x + 3y = 16 \quad \cdots (1)$$

$$3x + 2y = 14 \quad \cdots (2)$$

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

$$4x + 6y = 32 \quad \cdots (3)$$

$$9x + 6y = 42 \quad \cdots (4)$$

Step 2 — Subtract (3) from (4):

$$5x = 10 \implies x = \mathbf{2}$$

Step 3 — Find y (verify): From (1): $4 + 3y = 16 \implies y = 4$. Check in (2): $6 + 8 = 14$. ✓

Why other options are wrong:

- Option A (4): That is the value of y, not x.
- Option B (3): Does not satisfy either equation consistently.
- Option C (5): $x = 5$ gives $10 + 3y = 16 \Rightarrow y = 2$; check (2): $15 + 4 = 19 \neq 14$.

Final Answer: $x = 2 \Rightarrow$ D

Answer: (D) Go Back to Q36

Q37.

Solution

Concept — Sum and Difference to find two numbers:

$$a+b=S,\quad a-b=D \implies a=\frac{S+D}{2},\quad b=\frac{S-D}{2}$$

Step 1 — Find the two numbers:

$$a=\frac{25+7}{2}=16,\quad b=\frac{25-7}{2}=9$$

Step 2 — Compute the product:

$$a\times b=16\times 9=\mathbf{144}$$

Why other options are wrong:

- Option B (126): Could result from 14×9 or 18×7 (wrong pair).
- Option C (160): Could result from 16×10 (wrong second number).
- Option D (132): Could result from 12×11 (does not satisfy sum/diff conditions).

Final Answer: Product $=144 \Rightarrow$ A

Answer: (A) Go Back to Q37

Q38.

Solution

Concept — Quadratic Equation by Factorisation:

$$x^2-5x+6=0$$

Step 1 — Factorise: Find two numbers that multiply to 6 and add to -5: these are -2 and -3.

$$(x-2)(x-3)=0$$

Step 2 — Roots:

$$x=2 \quad \text{or} \quad x=3$$

Why other options are wrong:

- Option A (1 and 6): $1 + 6 = 7 \neq 5$ and $1 \times 6 = 6$ ✓for product but not sum.
- Option C (3 and 4): $3 + 4 = 7 \neq 5$.
- Option D (2 and 4): $2 + 4 = 6 \neq 5$.

Final Answer: Roots are 2 and 3 $\Rightarrow$ B

Answer: (B) Go Back to Q38

Q39.

Solution

Concept — Rectangle: Area leads to dimensions, then Perimeter:

Step 1 — Set up the equation. Let width $= w$ cm. Then length $= w + 3$ cm.

$$w(w + 3) = 54$$

$$w^2 + 3w - 54 = 0$$

Step 2 — Solve by factorisation: $(w + 9)(w - 6) = 0 \implies w = 6$ cm (taking positive value). Length $= 6 + 3 = 9$ cm.

Step 3 — Perimeter:

$$P = 2(l + w) = 2(9 + 6) = 2 \times 15 = \mathbf{30\ cm}$$

Why other options are wrong:

- Option A (24 cm): Uses incorrect dimensions (e.g., $w = 5, l = 8$: area=40, not 54).
- Option B (27 cm): Non-standard perimeter value.
- Option D (36 cm): Would give dimensions of $l = 10, w = 8$ (area=80, not 54).

Final Answer: Perimeter $= 30$ cm $\Rightarrow$ C

Answer: (C) Go Back to Q39

Q40.

Solution

Concept — Heron's Formula:

$$s = \frac{a+b+c}{2}, \quad \text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

Step 1 — Semi-perimeter:

$$s = \frac{13+14+15}{2} = 21$$

Step 2 — Area:

$$\text{Area} = \sqrt{21 \times (21-13) \times (21-14) \times (21-15)} = \sqrt{21 \times 8 \times 7 \times 6} = \sqrt{7056} = \mathbf{84\ cm^2}$$

Verification: $21 \times 8 = 168$; $7 \times 6 = 42$; $168 \times 42 = 7056$; $\sqrt{7056} = 84$.

Why other options are wrong:

- Option A (72 cm^2): Uses incorrect semi-perimeter or factors.
- Option B (78 cm^2): Common arithmetic error in Heron's formula.
- Option C (90 cm^2): Overestimates; assumes a right triangle with legs 12 and 15.

Final Answer: Area $= 84\ cm^2 \Rightarrow$ D

Answer: (D) Go Back to Q40

Q41.

Solution

Concept — Circle: Circumference to Radius to Area:

$$C = 2\pi r \implies r = \frac{C}{2\pi} \quad ; \quad \text{Area} = \pi r^2$$

Step 1 — Find radius:

$$44 = 2 \times \frac{22}{7} \times r \implies r = \frac{44 \times 7}{2 \times 22} = \frac{308}{44} = 7\ \text{cm}$$

Step 2 — Calculate area:

$$\text{Area} = \frac{22}{7} \times 7^2 = \frac{22}{7} \times 49 = 22 \times 7 = \mathbf{154\ cm^2}$$

Why other options are wrong:

- Option B (132 cm^2): Uses $r = 6$ cm (wrong radius).
- Option C (176 cm^2): Uses $r = 8$ cm (wrong radius).
- Option D (144 cm^2): Uses $\pi \approx 3$ instead of $22/7$.

Final Answer: Area $= 154\ cm^2 \Rightarrow \boxed{A}$

Answer: (A) Go Back to Q41

Q42.

Solution

Concept — Rectangle Diagonal (Pythagoras Theorem):

$$d = \sqrt{l^2 + w^2}$$

Calculation:

$$d = \sqrt{40^2 + 30^2} = \sqrt{1{,}600 + 900} = \sqrt{2{,}500} = \mathbf{50\ cm}$$

Why other options are wrong:

- Option A (45 cm): Not derivable from 30 and 40.
- Option C (55 cm): $\sqrt{40^2 + 39^2} \approx 55$ (wrong width).
- Option D (60 cm): $\sqrt{48^2 + 36^2} = 60$ but dimensions differ from the question.

Final Answer: Diagonal $= 50$ cm $\Rightarrow \boxed{B}$

Answer: (B) Go Back to Q42

Q43.

Solution

Concept — Volume of a Cylinder:

$$V = \pi r^2 h$$

Given: $r = 7$ cm, $h = 10$ cm, $\pi = \dfrac{22}{7}$.

Calculation:

$$V = \frac{22}{7} \times 7^2 \times 10 = \frac{22}{7} \times 49 \times 10 = 22 \times 7 \times 10 = \textbf{1,540 cm}^3$$

Why other options are wrong:

- Option A (1,440 cm^3): Uses $r = 6$ (wrong radius: $\pi \times 36 \times 10 \times 22/7 \approx 1{,}131$; or another error).
- Option B (1,320 cm^3): Incorrect substitution.
- Option D (1,650 cm^3): Uses $r = 7, h = 10.7$ or approximate π.

Final Answer: Volume $= 1{,}540$ cm$^3 \Rightarrow$ C

Answer: (C) Go Back to Q43

Q44.

Solution

Concept — Similar Triangles (Basic Proportionality Theorem): When $DE \parallel BC$ in $\triangle ABC$, then $\triangle ADE \sim \triangle ABC$, giving:

$$\frac{DE}{BC} = \frac{AD}{AB}$$

Step 1 — Find AB:

$$AB = AD + DB = 4 + 6 = 10 \text{ cm}$$

Step 2 — Apply the ratio:

$$\frac{6}{BC} = \frac{4}{10} \implies BC = \frac{6 \times 10}{4} = \frac{60}{4} = \textbf{15 cm}$$

Why other options are wrong:

- Option A (10 cm): Equals AB; misreads the question.

- Option B (12 cm): Uses $DB/AB = 6/10$; applies ratio to DB instead of AD.
- Option C (18 cm): Uses $AB/AD \times DE = 10/4 \times 6 = 15$... same as correct; possibly a reversal error.

Final Answer: $BC = 15$ cm $\Rightarrow$ D

Answer: (D) Go Back to Q44

Q45.

Solution

Concept — Geometric Progression: Each term is obtained by multiplying the previous term by a constant ratio.

Step 1 — Identify the pattern:

$$2,\ 6,\ 18,\ 54,\ \ldots$$

Common ratio $r = 6/2 = 3$.

Step 2 — Next term:

$$54 \times 3 = \mathbf{162}$$

Why other options are wrong:

- Option B (108): 54×2 (uses ratio 2 instead of 3).
- Option C (144): Not part of this geometric series.
- Option D (180): $54 + 126$ (no clear pattern logic).

Final Answer: Next term $= 162 \Rightarrow$ A

Answer: (A) Go Back to Q45

Q46.

Solution

Concept — Arithmetic Difference Series: The differences between consecutive terms form an arithmetic progression.

Step 1 — Find differences:

$$7 - 3 = 4, \quad 13 - 7 = 6, \quad 21 - 13 = 8, \quad 31 - 21 = 10$$

Differences: 4, 6, 8, 10, ... (increasing by 2).

Step 2 — Next difference: $10 + 2 = 12$.

Step 3 — Next term:

$$31 + 12 = \mathbf{43}$$

Why other options are wrong:

- Option A (41): Uses next difference of 10 (not 12).
- Option C (45): Uses next difference of 14 (skips one step).
- Option D (47): Uses next difference of 16.

Final Answer: Next term $= 43 \Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q46

Q47.

Solution

Concept — Perfect Square Series: The series should follow $1^2, 2^2, 3^2, 4^2, 5^2, 6^2$.

Step 1 — Expected series:

$$1,\ 4,\ 9,\ 16,\ 25,\ 36$$

Step 2 — Compare with given series:

$$1,\ 4,\ 9,\ 16,\ \mathbf{26},\ 36$$

The 5th term should be $5^2 = 25$, but **26** is given.

Step 3 — Wrong term: 26 (should be 25).

Why other options are wrong:

- Option A (9): $3^2 = 9$ is correct.
- Option B (16): $4^2 = 16$ is correct.
- Option D (36): $6^2 = 36$ is correct.

Final Answer: Wrong term $= 26 \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q47

Q48.

Solution

Concept — Combinations:

$$\binom{n}{r} = \frac{n!}{r!\,(n-r)!}$$

Given: $n = 8$, $r = 3$.

Calculation:

$$\binom{8}{3} = \frac{8!}{3! \times 5!} = \frac{8 \times 7 \times 6}{3 \times 2 \times 1} = \frac{336}{6} = \mathbf{56}$$

Why other options are wrong:

- Option A (42): $\binom{7}{3} = 35$ or wrong factorial.
- Option B (48): Not a valid combination result for this problem.
- Option C (24): $4! = 24$; confuses factorials.

Final Answer: Number of ways $= 56 \Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q48

Q49.

Solution

Concept — Basic Probability:

$$P(\text{event}) = \frac{\text{Number of favourable outcomes}}{\text{Total number of outcomes}}$$

Step 1 — Total balls: $4 + 3 + 2 = 9$.

Step 2 — Probability of drawing a red ball:

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

Why other options are wrong:

- Option B $(1/3)$: Probability of drawing a blue ball $(3/9)$.
- Option C $(2/9)$: Probability of drawing a green ball.
- Option D $(5/9)$: Probability of drawing a non-red ball.

Final Answer: $P(\text{red}) = \frac{4}{9} \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q49

Q50.

Solution

Concept — Permutations (without repetition):

$$P(n, r) = \frac{n!}{(n-r)!}$$

Given: 5 digits, forming 3-digit numbers without repetition. $n = 5$, $r = 3$.

Calculation:

$$P(5, 3) = \frac{5!}{(5-3)!} = \frac{5!}{2!} = \frac{120}{2} = 5 \times 4 \times 3 = \mathbf{60}$$

Why other options are wrong:

- Option A (120): $5! = 120$; counts all arrangements of all 5 digits (5-digit numbers).
- Option C (24): $4! = 24$ or $P(4, 3)$; uses wrong n.
- Option D (48): Not a standard permutation result for this scenario.

Final Answer: Total 3-digit numbers $= 60 \Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q50

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	A	2	B	3	C	4	D	5	A
6	B	7	C	8	D	9	A	10	B
11	C	12	D	13	A	14	B	15	C
16	D	17	A	18	B	19	C	20	D
21	A	22	B	23	C	24	D	25	A
26	B	27	C	28	D	29	A	30	B
31	C	32	D	33	A	34	B	35	C
36	D	37	A	38	B	39	C	40	D
41	A	42	B	43	C	44	D	45	A
46	B	47	C	48	D	49	A	50	B