

KMAT Quantitative Ability

Sample Paper – 3

Duration: 40 Minutes

Maximum Marks: 40

Instructions

- This paper contains **40 Multiple Choice Questions (Single Correct Answer)**, modelled on the Quantitative Ability section of the **KMAT Karnataka** entrance examination.
- Each correct answer carries **+1 mark**. There is **no negative marking** for incorrect or unattempted answers – attempt every question.
- Only **one** option is correct per question. Choose carefully.
- Syllabus level: **MBA entrance – Arithmetic, Data Interpretation, Number System, Algebra, Ratio & Proportion, Geometry, Modern Mathematics, Trigonometry & Statistics.**
- Personal calculators, mobile phones, and other electronic gadgets are strictly prohibited inside the examination hall.
- The full KMAT paper is 120 questions in 120 minutes across three sections; there are **no sectional time limits** – allocate approximately 40 minutes to this Quantitative Ability section.

Q1. A person spends 30% of his income on food, 25% on rent, and 20% on other expenses. What percentage of his income does he save?

- (A) 10%
- (B) 20%
- (C) 25%
- (D) 30%

Q2. The price of a commodity increases by 25%. By what percentage must consumption be reduced to keep expenditure the same?

- (A) 15%



- (B) 25%
- (C) 22%
- (D) 20%

Q3. Raju's score in an exam improved from 40 marks to 50 marks. What is the percentage increase?

- (A) 25%
- (B) 10%
- (C) 20%
- (D) 15%

Q4. A person sells an article at a 20% loss. Had he sold it for Rs. 200 more, he would have made a 5% gain. Find the cost price.

- (A) Rs. 600
- (B) Rs. 800
- (C) Rs. 1,000
- (D) Rs. 1,200

Q5. An item costs Rs. 1,500. At what price must it be sold to make a 10% profit?

- (A) Rs. 1,600
- (B) Rs. 1,620
- (C) Rs. 1,650
- (D) Rs. 1,700

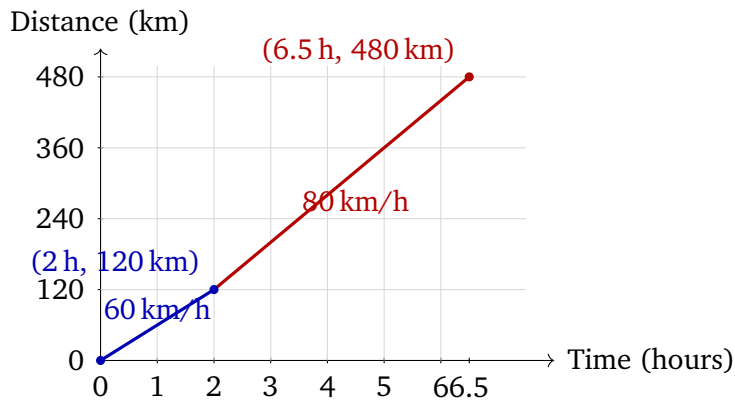
Q6. A man walks at 4 km/h. How long does he take to cover 10 km?

- (A) 2 hours
- (B) 2 hours 15 min
- (C) 2 hours 20 min



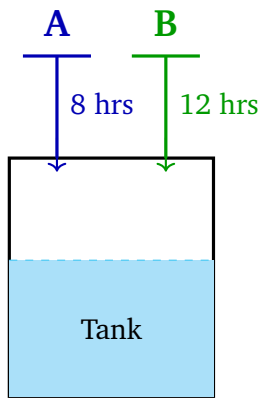
(D) 2 hours 30 min

- Q7.** The distance between two cities is 480 km. A train travels at 60 km/h. After 2 hours, the speed is increased to 80 km/h for the rest of the journey. What is the total travel time?



- (A) 6 hours 30 min
 (B) 7 hours
 (C) 7 hours 30 min
 (D) 6 hours
- Q8.** A and B together complete a work in 10 days. B and C together in 12 days. A and C together in 15 days. In how many days can all three working together complete it?
- (A) 6 days
 (B) 8 days
 (C) 9 days
 (D) 10 days
- Q9.** Pipe A fills a tank in 8 hours and Pipe B fills it in 12 hours. Both are opened for 3 hours, then Pipe A is closed. How many more hours does Pipe B take to finish filling the tank?





- (A) 3 hours
- (B) 4 hours
- (C) 4.5 hours
- (D) 5 hours

Q10. Find the simple interest on Rs. 12,000 at 12% per annum for 2.5 years.

- (A) Rs. 2,400
- (B) Rs. 2,880
- (C) Rs. 3,000
- (D) Rs. 3,600

Q11. Find the amount (principal + CI) on Rs. 8,000 at 10% per annum for 3 years (compounded annually).

- (A) Rs. 10,648
- (B) Rs. 10,400
- (C) Rs. 10,240
- (D) Rs. 11,000

Q12. A container holds 20 litres of a solution with alcohol and water in the ratio 3 : 1. If 5 litres of water are added, what is the new ratio of alcohol to water?

- (A) 2 : 1

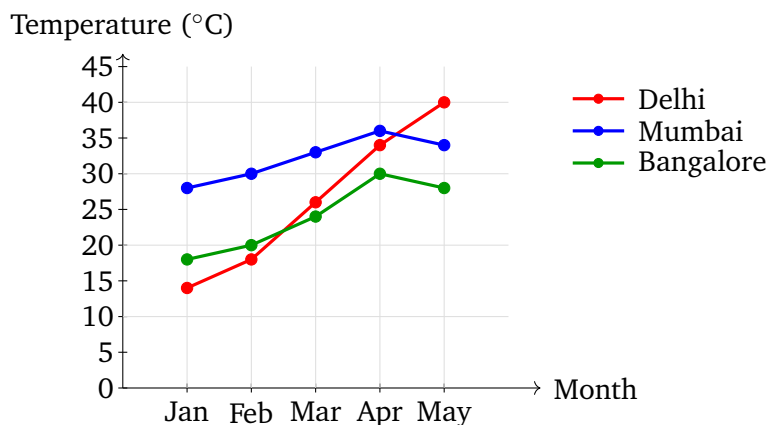


- (B) 3 : 2
- (C) 4 : 3
- (D) 5 : 2

Q13. A shopkeeper gains 20% by selling an article. If he sells it at twice the selling price, what would be the new profit percentage?

- (A) 100%
- (B) 120%
- (C) 140%
- (D) 160%

Directions (Q14–Q17): The line graph below shows the average monthly temperature ($^{\circ}\text{C}$) in three cities — Delhi, Mumbai, and Bangalore — for January to May. Study it and answer questions 14 to 17.



Q14. In which month was the temperature difference between Delhi and Bangalore the greatest?

- (A) January
- (B) March
- (C) April
- (D) May

Q15. What is the average temperature of Mumbai over the five months?



- (A) 32.2°C
- (B) 33°C
- (C) 30°C
- (D) 31.5°C

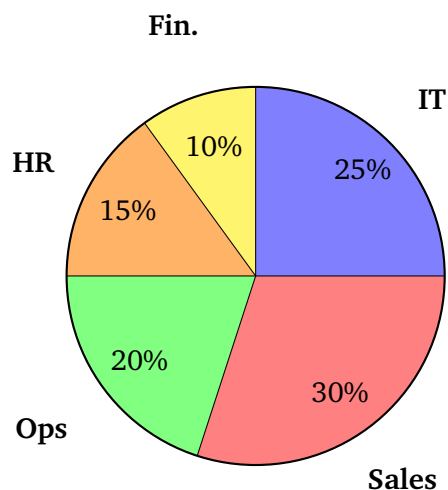
Q16. By how many degrees Celsius did Bangalore's temperature increase from January to April?

- (A) 10°C
- (B) 12°C
- (C) 14°C
- (D) 8°C

Q17. In how many months was Delhi's temperature above 25°C ?

- (A) 1
- (B) 2
- (C) 3
- (D) 4

Directions (Q18–Q21): The pie chart below shows the distribution of 240 employees across five departments of a company. Study it and answer questions 18 to 21.



- Q18.** What is the total number of employees in the IT and Sales departments combined?
- (A) 96
 - (B) 108
 - (C) 120
 - (D) 132
- Q19.** What percentage of employees work in HR and Finance combined?
- (A) 25%
 - (B) 20%
 - (C) 30%
 - (D) 10%
- Q20.** What is the ratio of IT department employees to Finance department employees?
- (A) 3 : 1
 - (B) 5 : 2
 - (C) 4 : 1
 - (D) 6 : 1
- Q21.** If 12 employees are transferred from Operations to IT, what is the new headcount in the IT department?
- (A) 68
 - (B) 70
 - (C) 72
 - (D) 75
- Q22.** What is the unit digit of 7^{100} ?
- (A) 7



- (B) 9
- (C) 3
- (D) 1

Q23. Find the GCD (HCF) of 180 and 252.

- (A) 36
- (B) 18
- (C) 72
- (D) 12

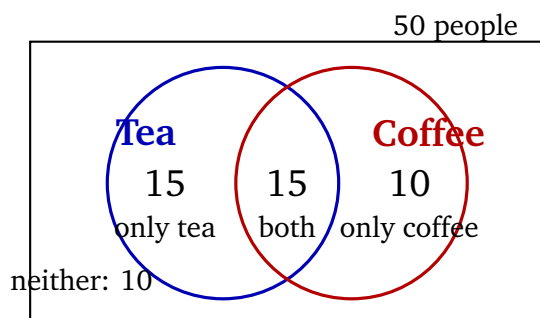
Q24. Find the sum of all odd integers from 11 to 29 (inclusive).

- (A) 180
- (B) 200
- (C) 220
- (D) 240

Q25. If $n! = 720$, find n .

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

Q26. In a survey of 50 people: 30 like tea, 25 like coffee, and 15 like both. How many people like *only* tea?



- (A) 20
- (B) 25
- (C) 10
- (D) 15

Q27. If $2^x = 64$, find x .

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

Q28. Find the value of k if $x = 2$ is a root of $2x^2 - kx + 6 = 0$.

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

Q29. Find the sum of the first 15 terms of the AP: 5, 8, 11, 14, ...

- (A) 360
- (B) 375
- (C) 390
- (D) 400

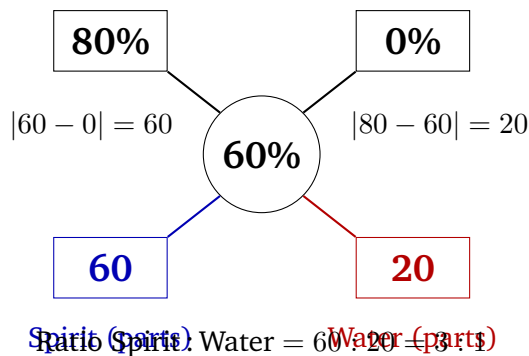
Q30. The product of two consecutive even integers is 168. Find their sum.

- (A) 22
- (B) 24
- (C) 28
- (D) 26



- Q31.** Rs. 2,520 is shared between P and Q in the ratio 5 : 4. What is P's share?
- (A) Rs. 1,400
 (B) Rs. 1,120
 (C) Rs. 1,260
 (D) Rs. 1,680

- Q32.** Spirit of 80% concentration is mixed with water (0%) to obtain a solution of 60% concentration. What is the ratio of spirit to water?

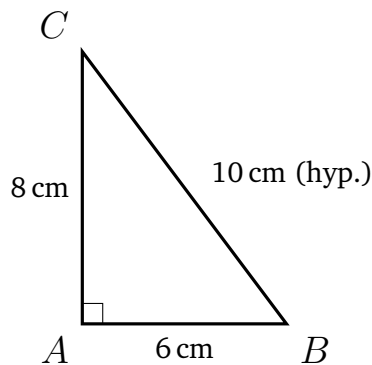


- (A) 1 : 3
 (B) 3 : 1
 (C) 2 : 1
 (D) 1 : 2
- Q33.** P and Q start a business with Rs. 7,000 and Rs. 9,000. After 6 months, R joins with Rs. 8,000. At year-end, total profit = Rs. 21,000. Find R's share.
- (A) Rs. 3,000
 (B) Rs. 3,600
 (C) Rs. 4,200
 (D) Rs. 5,000
- Q34.** Two numbers A and B are in the ratio 5 : 7. If A is increased by 18 and B is decreased by 10, the new ratio is 9 : 11. Find the original value of A.



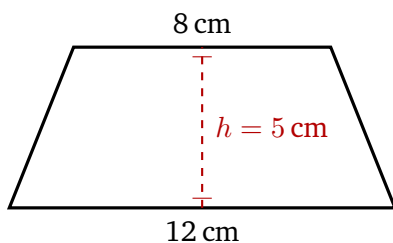
- (A) 90
- (B) 126
- (C) 150
- (D) 180

Q35. In a right-angled triangle, the hypotenuse is 10 cm and one leg is 6 cm. Find the area of the triangle.



- (A) 24 cm^2
- (B) 30 cm^2
- (C) 36 cm^2
- (D) 40 cm^2

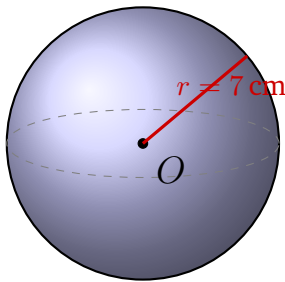
Q36. A trapezium has parallel sides of 12 cm and 8 cm and a height of 5 cm. Find its area.



- (A) 40 cm^2
- (B) 50 cm^2
- (C) 60 cm^2
- (D) 100 cm^2



Q37. Find the total surface area of a sphere with radius 7 cm. (Use $\pi = \frac{22}{7}$)



- (A) 154 cm^2
- (B) 308 cm^2
- (C) 616 cm^2
- (D) 1232 cm^2

Q38. In how many ways can 4 different books be arranged on a shelf?

- (A) 8
- (B) 12
- (C) 16
- (D) 24

Q39. Two dice are thrown simultaneously. What is the probability that the sum of the numbers shown is 7?

6	6	5	4	3	2	1
5	5	4	3	2	1	6
4	4	3	2	1	6	5
3	3	2	1	6	5	4
2	2	1	6	5	4	3
1	1	6	5	4	3	2
	1	2	3	4	5	6
	Die 2					

sum = 7

- (A) $\frac{1}{6}$
- (B) $\frac{1}{12}$
- (C) $\frac{1}{4}$



(D) $\frac{7}{36}$

Q40. Find the mode of the data: 4, 7, 2, 9, 4, 7, 4, 8, 3, 7, 4.

(A) 7

(B) 4

(C) 9

(D) 3



Detailed Solutions

Q1.

Solution

Concept — Percentage (Savings): Total spending + savings = 100% of income.

Step 1 — Add all expenditures: Food 30% + Rent 25% + Other 20% = 75%.

Step 2 — Find savings: Savings = 100% – 75% = 25%. **Why other options are wrong:**

- Option A: 10% — Misses the other-expenses component.
- Option B: 20% — Counts only food and rent as 80%, incorrect total.
- Option C: Correct.
- Option D: 30% — Confuses the food-spending share with savings.

Final Answer: Savings = 25% $\Rightarrow$ C

Answer: (C) [Go Back to Q1](#)

Q2.

Solution

Concept — Percentage (Inverse Reduction): If price increases by $r\%$, then consumption must decrease by $\frac{r}{100 + r} \times 100\%$. **Step 1 — Apply formula:** Reduction

$= \frac{25}{125} \times 100 = 20\%$. **Step 2 — Verify:** New expenditure = $1.25P \times 0.80Q = PQ$ (unchanged). **✓ Why other options are wrong:**

- Option A: 15% — Undercounts; does not neutralise the full 25% rise.
- Option B: 25% — Confuses the price-rise percentage with the consumption-cut percentage.
- Option C: 22% — Approximate/arbitrary, not derived from the formula.
- Option D: Correct (20%).

Final Answer: Consumption must be reduced by 20% $\Rightarrow$ D

Answer: (D) [Go Back to Q2](#)



Q3.

Solution

Concept — Percentage Increase: $\% \text{ increase} = \frac{\text{New} - \text{Old}}{\text{Old}} \times 100$. **Step 1 —**

Substitute values: $\% = \frac{50 - 40}{40} \times 100 = \frac{10}{40} \times 100 = 25\%$. **Why other options are wrong:**

- Option A: Correct.
- Option B: 10% — Uses absolute increase, not relative increase.
- Option C: 20% — Divides by 50 (new value) instead of 40 (old value).
- Option D: 15% — No valid derivation.

Final Answer: Percentage increase = 25% $\Rightarrow$ A

Answer: (A) [Go Back to Q3](#)

Q4.

Solution

Concept — Profit and Loss (Finding CP from Two Conditions): Difference in selling prices = difference in profit/loss amounts. **Step 1 — Express SP in terms of CP:** $SP_1 = 0.80 \text{ CP}$ (20% loss); $SP_2 = 1.05 \text{ CP}$ (5% gain). **Step 2 — Set up equation:** $SP_2 - SP_1 = 200 \Rightarrow 1.05 \text{ CP} - 0.80 \text{ CP} = 200 \Rightarrow 0.25 \text{ CP} = 200 \Rightarrow \text{CP} = 800$. **Why other options are wrong:**

- Option A: Rs. 600 — Results from using 33.3% difference, not 25%.
- Option B: Correct.
- Option C: Rs. 1,000 — Over-estimates CP.
- Option D: Rs. 1,200 — Uses an incorrect percentage gap.

Final Answer: Cost price = Rs. 800 $\Rightarrow$ B

Answer: (B) [Go Back to Q4](#)



Q5.

Solution

Concept — Selling Price for Required Profit: $SP = CP \times \left(1 + \frac{\text{Profit}\%}{100}\right)$. **Step 1**

— Calculate SP: $SP = 1500 \times 1.10 = 1650$. **Why other options are wrong:**

- Option A: Rs. 1,600 — Adds Rs. 100 (6.67% profit), not 10%.
- Option B: Rs. 1,620 — Adds Rs. 120 (8% profit), not 10%.
- Option C: Correct.
- Option D: Rs. 1,700 — Adds Rs. 200 (13.3% profit), not 10%.

Final Answer: Selling price = Rs. 1,650 $\Rightarrow$ C

Answer: (C) [Go Back to Q5](#)

Q6.

Solution

Concept — Time, Speed and Distance: $\text{Time} = \frac{\text{Distance}}{\text{Speed}}$. **Step 1 — Calculate**

time: $\text{Time} = \frac{10}{4} = 2.5 \text{ hours} = 2 \text{ hours } 30 \text{ min}$. **Why other options are wrong:**

- Option A: 2 hours — Implies speed of 5 km/h, not 4 km/h.
- Option B: 2 hours 15 min — Implies 8 km covered, not 10 km.
- Option C: 2 hours 20 min — Implies fractional km, no clean derivation.
- Option D: Correct.

Final Answer: Time taken = 2 hours 30 min $\Rightarrow$ D

Answer: (D) [Go Back to Q6](#)

Q7.

Solution

Concept — Variable Speed Journey: Divide the journey into segments and add time for each. **Step 1 — Distance in first 2 hours:** $d_1 = 60 \times 2 = 120 \text{ km}$. **Step**

2 — Remaining distance: $d_2 = 480 - 120 = 360 \text{ km}$. **Step 3 — Time for second segment at 80 km/h:** $t_2 = \frac{360}{80} = 4.5 \text{ hours}$. **Step 4 — Total time:** $2 + 4.5 = 6.5 \text{ hours} = 6 \text{ hours } 30 \text{ min}$. **Why other options are wrong:**



- Option A: Correct.
- Option B: 7 hours — Adds 5 hours for second segment; uses wrong distance or speed.
- Option C: 7 hours 30 min — Overestimates second-segment time.
- Option D: 6 hours — Underestimates by ignoring initial segment time correctly.

Final Answer: Total travel time = 6 hours 30 min $\Rightarrow$ A

Answer: (A) [Go Back to Q7](#)

Q8.

Solution

Concept — Time and Work (Three Persons): Use unit-work (efficiency) method with pair-wise data. **Step 1 — Write pair-wise rates:** $A + B = \frac{1}{10}$; $B + C = \frac{1}{12}$; $A + C = \frac{1}{15}$. **Step 2 — Sum all three:** $2(A + B + C) = \frac{1}{10} + \frac{1}{12} + \frac{1}{15} = \frac{6+5+4}{60} = \frac{15}{60} = \frac{1}{4}$. **Step 3 — Combined rate:** $A + B + C = \frac{1}{8}$, so together they finish in 8 days. **Why other options are wrong:**

- Option A: 6 days — Overestimates combined efficiency.
- Option B: Correct.
- Option C: 9 days — Under-estimates combined efficiency.
- Option D: 10 days — Equals A+B's time only, ignores C.

Final Answer: All three together complete work in 8 days $\Rightarrow$ B

Answer: (B) [Go Back to Q8](#)

Q9.

Solution

Concept — Pipe and Cistern (Fractional Work): Work done = rate $\times$ time. **Step 1 — Rates:** A fills $\frac{1}{8}$ /hr; B fills $\frac{1}{12}$ /hr. Combined = $\frac{1}{8} + \frac{1}{12} = \frac{5}{24}$ /hr. **Step 2 — Work in 3 hours:** $3 \times \frac{5}{24} = \frac{15}{24} = \frac{5}{8}$. **Step 3 — Remaining work after A is closed:** $1 - \frac{5}{8} = \frac{3}{8}$. **Step 4 — Time for B alone:** $\frac{3/8}{1/12} = \frac{3}{8} \times 12 = 4.5$ hours. **Why other options are wrong:**

- Option A: 3 hours — Ignores what was already filled in the combined phase.



- Option B: 4 hours — Slightly underestimates; error in fraction arithmetic.
- Option C: Correct.
- Option D: 5 hours — Overestimates remaining work.

Final Answer: Pipe B needs 4.5 more hours $\Rightarrow$ C

Answer: (C) [Go Back to Q9](#)

Q10.

Solution

Concept — Simple Interest: $SI = \frac{P \times R \times T}{100}$. **Step 1 — Substitute:** $SI = \frac{12000 \times 12 \times 2.5}{100} = \frac{360000}{100} = 3600$. **Why other options are wrong:**

- Option A: Rs. 2,400 — Uses $T = 2$ years instead of 2.5.
- Option B: Rs. 2,880 — Applies 12% on only Rs. 12,000 for 2 years, then scales incorrectly.
- Option C: Rs. 3,000 — Uses rate 10% instead of 12%.
- Option D: Correct.

Final Answer: Simple Interest = Rs. 3,600 $\Rightarrow$ D

Answer: (D) [Go Back to Q10](#)

Q11.

Solution

Concept — Compound Interest: $\text{Amount} = P \left(1 + \frac{r}{100}\right)^n$. **Step 1 — Substitute:** $\text{Amount} = 8000 \times (1.1)^3 = 8000 \times 1.331 = 10648$. **Step 2 — Verify:** Year 1: 8800; Year 2: 9680; Year 3: 10648. ✓ **Why other options are wrong:**

- Option A: Correct.
- Option B: Rs. 10,400 — Uses simple interest for 3 years (8000×1.3).
- Option C: Rs. 10,240 — Applies only 2-year compounding.
- Option D: Rs. 11,000 — Overstates interest, uses $r > 10\%$.

Final Answer: Amount after 3 years = Rs. 10,648 $\Rightarrow$ A

Answer: (A) [Go Back to Q11](#)



Q12.

Solution

Concept — Mixture (Adding a Component): Find individual quantities, then recalculate ratio. **Step 1 — Find initial quantities:** Total = 20 L; ratio 3:1. Alcohol = 15 L; Water = 5 L. **Step 2 — Add 5 L water:** New water = 5 + 5 = 10 L. Alcohol unchanged = 15 L. **Step 3 — New ratio:** Alcohol : Water = 15 : 10 = 3 : 2.

Why other options are wrong:

- Option A: 2:1 — Ignores the additional water correctly.
- Option B: Correct.
- Option C: 4:3 — Miscalculates original water quantity.
- Option D: 5:2 — No valid derivation from given data.

Final Answer: New ratio = 3 : 2 $\Rightarrow$ **B**

Answer: (B) [Go Back to Q12](#)

Q13.

Solution

Concept — Profit on Modified Selling Price: New profit % = $\frac{\text{New SP} - \text{CP}}{\text{CP}} \times 100$. **Step 1 — Assign CP:** Let CP = 100. Then original SP = 120 (20% gain). **Step 2 —**

New SP: $2 \times 120 = 240$. **Step 3 — New profit %:** $\frac{240 - 100}{100} \times 100 = 140\%$. **Why**

other options are wrong:

- Option A: 100% — Assumes new SP = $2 \times \text{CP}$, not $2 \times \text{SP}$.
- Option B: 120% — Doubles original profit percentage only.
- Option C: Correct.
- Option D: 160% — Computational error in new SP calculation.

Final Answer: New profit = 140% $\Rightarrow$ **C**

Answer: (C) [Go Back to Q13](#)



Q14.

Solution

Concept — Data Interpretation (Line Graph): Compare temperature differences month by month. **Step 1 — Read differences:** Jan: $14 - 18 = -4$ (Bangalore >

Delhi, so Delhi - Bangalore = -4).

Mar: $26 - 24 = 2$.

Apr: $34 - 30 = 4$.

May: $40 - 28 = 12$. **Step 2 — Identify maximum:** May shows the largest difference of 12°C . **Why other options are wrong:**

- Option A: January — Bangalore is warmer; difference is only 4°C .
- Option B: March — Difference is only 2°C .
- Option C: April — Difference is 4°C , less than May.
- Option D: Correct.

Final Answer: Greatest difference in May $\Rightarrow$ **D**

Answer: (D) [Go Back to Q14](#)

Q15.

Solution

Concept — Average Temperature (DI): Average = $\frac{\text{Sum of values}}{\text{Number of values}}$. **Step 1 —**

Sum Mumbai temperatures: $28 + 30 + 33 + 36 + 34 = 161$. **Step 2 — Calculate**

average: $\frac{161}{5} = 32.2^\circ\text{C}$. **Why other options are wrong:**

- Option A: Correct.
- Option B: 33°C — Over-counts one month's value.
- Option C: 30°C — Equals Jan value; not the average.
- Option D: 31.5°C — Uses 4 months instead of 5.

Final Answer: Average Mumbai temperature = $32.2^\circ\text{C} \Rightarrow$ **A**

Answer: (A) [Go Back to Q15](#)



Q16.

Solution

Concept — Reading a Line Graph (Change): Change = Final value – Initial value. **Step 1 — Read values:** Bangalore Jan = 18°C; April = 30°C. **Step 2 —**

Calculate increase: $30 - 18 = 12^\circ\text{C}$. **Why other options are wrong:**

- Option A: 10°C — Reads April as 28°C (May value) by mistake.
- Option B: Correct.
- Option C: 14°C — Adds an extra 2°C in error.
- Option D: 8°C — Reads January as 22°C (incorrect).

Final Answer: Increase = $12^\circ\text{C} \Rightarrow \boxed{\text{B}}$

Answer: (B) [Go Back to Q16](#)

Q17.

Solution

Concept — Counting from Line Graph: Count months where Delhi's reading exceeds 25°C. **Step 1 — Check each month:** Jan = 14 (No); Feb = 18 (No); Mar = 26 (Yes); Apr = 34 (Yes); May = 40 (Yes). **Step 2 — Count:** 3 months (March, April, May). **Why other options are wrong:**

- Option A: 1 — Counts only May.
- Option B: 2 — Counts only April and May.
- Option C: Correct.
- Option D: 4 — Incorrectly includes February.

Final Answer: Delhi above 25°C in 3 months $\Rightarrow \boxed{\text{C}}$

Answer: (C) [Go Back to Q17](#)



Q18.

Solution

Concept — Pie Chart (Adding Sectors): Employees in a department = percentage $\times$ total. **Step 1 — IT employees:** $25\% \times 240 = 60$. **Step 2 — Sales employees:** $30\% \times 240 = 72$. **Step 3 — Combined:** $60 + 72 = 132$. **Why other options are wrong:**

- Option A: 96 — Uses only 40% share, wrong departments.
- Option B: 108 — Uses $45\% \times 240$, incorrect combined percentage.
- Option C: 120 — Uses 50% share, not the actual 55%.
- Option D: Correct.

Final Answer: IT + Sales = 132 employees $\Rightarrow$ D

Answer: (D) [Go Back to Q18](#)

Q19.

Solution

Concept — Pie Chart (Reading Percentages): Simply add the given sector percentages. **Step 1 — HR percentage:** 15%. **Step 2 — Finance percentage:** 10%. **Step 3 — Combined:** $15 + 10 = 25\%$. **Why other options are wrong:**

- Option A: Correct.
- Option B: 20% — Counts only one of the two departments.
- Option C: 30% — Confuses Operations (20%) + Finance, or similar error.
- Option D: 10% — Counts only Finance.

Final Answer: HR + Finance = 25% $\Rightarrow$ A

Answer: (A) [Go Back to Q19](#)



Q20.

Solution

Concept — Ratio from Pie Chart: Use employee counts to form ratio. **Step 1 — IT employees:** 60. Finance employees: 24. **Step 2 — Ratio:** $60 : 24 = 5 : 2$. **Why other options are wrong:**

- Option A: 3:1 — Implies Finance = 20 employees, incorrect.
- Option B: Correct.
- Option C: 4:1 — Implies Finance = 15 employees, incorrect.
- Option D: 6:1 — Implies Finance = 10 employees, incorrect.

Final Answer: IT : Finance = 5 : 2 $\Rightarrow$ **B**

Answer: (B) [Go Back to Q20](#)

Q21.

Solution

Concept — Pie Chart (Transfer of Employees): Add transferred employees to the receiving department. **Step 1 — Current IT headcount:** $25\% \times 240 = 60$. **Step 2 — After transfer:** $60 + 12 = 72$. **Why other options are wrong:**

- Option A: 68 — Adds only 8 instead of 12.
- Option B: 70 — Adds only 10 instead of 12.
- Option C: Correct.
- Option D: 75 — Adds 15 instead of 12.

Final Answer: New IT headcount = 72 $\Rightarrow$ **C**

Answer: (C) [Go Back to Q21](#)

Q22.

Solution

Concept — Cyclicity of Unit Digits: Unit digit of powers of 7 follows cycle: 7, 9, 3, 1 (period 4). **Step 1 — Find position in cycle:** $100 \div 4 = 25$ remainder 0. Remainder 0 corresponds to the 4th position in the cycle. **Step 2 — Unit digit:** 4th position $\rightarrow$ unit digit = 1. **Why other options are wrong:**



- Option A: 7 — Corresponds to 7^1 (remainder 1).
- Option B: 9 — Corresponds to 7^2 (remainder 2).
- Option C: 3 — Corresponds to 7^3 (remainder 3).
- Option D: Correct.

Final Answer: Unit digit of $7^{100} = 1 \Rightarrow \boxed{\text{D}}$

Answer: (D) [Go Back to Q22](#)

Q23.

Solution

Concept — HCF by Prime Factorisation: HCF = product of common prime factors (lowest powers). **Step 1 — Factorise:** $180 = 2^2 \times 3^2 \times 5$; $252 = 2^2 \times 3^2 \times 7$.

Step 2 — Common factors: $2^2 \times 3^2 = 4 \times 9 = 36$. **Why other options are wrong:**

- Option A: Correct.
- Option B: 18 — Only uses 2×3^2 ; misses the factor of 2.
- Option C: 72 — Equals $2^3 \times 3^2$; takes higher power of 2, not valid for HCF.
- Option D: 12 — Only $2^2 \times 3$; misses one factor of 3.

Final Answer: $\text{HCF}(180, 252) = 36 \Rightarrow \boxed{\text{A}}$

Answer: (A) [Go Back to Q23](#)

Q24.

Solution

Concept — Sum of Odd Integers (AP): Identify the AP; use $S = \frac{n}{2}(a + l)$. **Step 1 — Identify series:** 11, 13, 15, 17, 19, 21, 23, 25, 27, 29. Number of terms $n = \frac{29 - 11}{2} + 1 = 10$. **Step 2 — Sum:** $S = \frac{10}{2}(11 + 29) = 5 \times 40 = 200$. **Why other options are wrong:**

- Option A: 180 — Miscounts as 9 terms.
- Option B: Correct.
- Option C: 220 — Includes 31 or uses $n = 11$.
- Option D: 240 — Uses incorrect first term or extra terms.

Final Answer: Sum of odd integers 11 to 29 = 200 $\Rightarrow \boxed{\text{B}}$

Answer: (B) [Go Back to Q24](#)



Q25.

Solution

Concept — Factorial: $n! = n \times (n - 1) \times \dots \times 1$. **Step 1 — Check factorials:** $5! = 120$; $6! = 720$; $7! = 5040$. **Step 2 — Match:** $n! = 720 \Rightarrow n = 6$. **Why other options are wrong:**

- Option A: 5 — $5! = 120 \neq 720$.
- Option B: 7 — $7! = 5040 \neq 720$.
- Option C: Correct.
- Option D: 8 — $8! = 40320 \neq 720$.

Final Answer: $n = 6 \Rightarrow \boxed{C}$

Answer: (C) [Go Back to Q25](#)

Q26.

Solution

Concept — Venn Diagram / Set Theory: Only Tea = Total Tea – Both. **Step 1 — Apply formula:** Only Tea = $30 - 15 = 15$. **Step 2 — Verify total:** Only Tea (15) + Both (15) + Only Coffee (10) + Neither (10) = 50. ✓ **Why other options are wrong:**

- Option A: 20 — Subtracts nothing from 35 incorrectly.
- Option B: 25 — Uses total-coffee value instead of computing only-tea.
- Option C: 10 — Gives only-coffee value, not only-tea.
- Option D: Correct.

Final Answer: Only tea = 15 people $\Rightarrow \boxed{D}$

Answer: (D) [Go Back to Q26](#)



Q27.

Solution

Concept — Exponential Equation (Same Base): $2^x = 64 = 2^6 \Rightarrow x = 6$. **Step 1**

— Express 64 as power of 2: $2^1 = 2, 2^2 = 4, 2^3 = 8, 2^4 = 16, 2^5 = 32, 2^6 = 64$.

Step 2 — Equate exponents: $x = 6$. **Why other options are wrong:**

- Option A: Correct.
- Option B: $7 \rightarrow 2^7 = 128 \neq 64$.
- Option C: $5 \rightarrow 2^5 = 32 \neq 64$.
- Option D: $8 \rightarrow 2^8 = 256 \neq 64$.

Final Answer: $x = 6 \Rightarrow \boxed{A}$

Answer: (A) [Go Back to Q27](#)

Q28.

Solution

Concept — Root of Quadratic Equation: If $x = 2$ is a root, substitute and solve for k . **Step 1 — Substitute $x = 2$:** $2(2)^2 - k(2) + 6 = 0 \Rightarrow 8 - 2k + 6 = 0 \Rightarrow 14 = 2k$.

Step 2 — Solve: $k = 7$. **Why other options are wrong:**

- Option A: 5 — Results from $10 - 2k + 6 = 0$, uses $x = 2$ in first term incorrectly.
- Option B: Correct.
- Option C: 8 — Results from dropping the constant term.
- Option D: 6 — Sets $8 - 2k = 0$ only, ignores the $+6$ term.

Final Answer: $k = 7 \Rightarrow \boxed{B}$

Answer: (B) [Go Back to Q28](#)

Q29.

Solution

Concept — Sum of AP: $S_n = \frac{n}{2}[2a + (n - 1)d]$. **Step 1 — Identify parameters:**

$a = 5, d = 3, n = 15$. **Step 2 — Calculate:** $S_{15} = \frac{15}{2}[2(5) + (14)(3)] = \frac{15}{2}[10 + 42] =$

$\frac{15}{2} \times 52 = 15 \times 26 = 390$. **Why other options are wrong:**



- Option A: 360 — Uses $n = 14$ or wrong common difference.
- Option B: 375 — Off by one term in the formula.
- Option C: Correct.
- Option D: 400 — Uses $d = 4$ instead of $d = 3$.

Final Answer: $S_{15} = 390 \Rightarrow$ C

Answer: (C) [Go Back to Q29](#)

Q30.

Solution

Concept — Product of Consecutive Even Integers: Let the integers be n and $n + 2$; solve $n(n + 2) = 168$. **Step 1 — Set up equation:** $n^2 + 2n - 168 = 0$. **Step**

2 — Factorise: $(n + 14)(n - 12) = 0 \Rightarrow n = 12$ (taking positive value). **Step 3 —**

Find sum: $12 + 14 = 26$. **Why other options are wrong:**

- Option A: 22 — Corresponds to integers 10 and 12; $10 \times 12 = 120 \neq 168$.
- Option B: 24 — Corresponds to integers 11 and 13 (odd); not even integers.
- Option C: 28 — Corresponds to integers 13 and 15 (odd); not even integers.
- Option D: Correct.

Final Answer: Sum = 26 $\Rightarrow$ D

Answer: (D) [Go Back to Q30](#)

Q31.

Solution

Concept — Ratio Division: P's share = $\frac{5}{5+4} \times 2520$. **Step 1 — Calculate:** P's

share = $\frac{5}{9} \times 2520 = 5 \times 280 = 1400$. **Why other options are wrong:**

- Option A: Correct.
- Option B: Rs. 1,120 — This is Q's share ($\frac{4}{9} \times 2520$), not P's.
- Option C: Rs. 1,260 — Divides equally (50:50), ignoring the 5:4 ratio.
- Option D: Rs. 1,680 — Uses ratio 6:3 instead of 5:4.

Final Answer: P's share = Rs. 1,400 $\Rightarrow$ A

Answer: (A) [Go Back to Q31](#)



Q32.

Solution

Concept — Alligation Rule: Ratio of components = (desired – cheaper) : (dearer – desired). **Step 1 — Apply alligation:** Spirit (80%), Water (0%), Desired (60%).

Step 2 — Differences: Spirit takes: $|60 - 0| = 60$ parts. Water takes: $|80 - 60| = 20$

parts. **Step 3 — Ratio:** Spirit : Water = $60 : 20 = 3 : 1$. **Why other options are wrong:**

- Option A: 1:3 — Inverts the ratio (confuses which diagonal belongs to which ingredient).
- Option B: Correct.
- Option C: 2:1 — Uses difference values $40 : 20$; incorrect lower value.
- Option D: 1:2 — Further inversion error.

Final Answer: Spirit : Water = $3 : 1 \Rightarrow$ **B**

Answer: (B) [Go Back to Q32](#)

Q33.

Solution

Concept — Partnership (Capital $\times$ Time): Profit is shared in proportion to capital $\times$ time invested. **Step 1 — Compute capital-time:** P: $7000 \times 12 = 84000$; Q:

$9000 \times 12 = 108000$; R: $8000 \times 6 = 48000$. **Step 2 — Total:** $84000 + 108000 + 48000 = 240000$. **Step 3 — Ratio:** P:Q:R = $84 : 108 : 48 = 7 : 9 : 4$. **Step 4 — R's share:**

$\frac{4}{20} \times 21000 = \text{Rs. } 4,200$. **Why other options are wrong:**

- Option A: Rs. 3,000 — Uses R's capital alone without time factor.
- Option B: Rs. 3,600 — Assumes R invested for 9 months, not 6.
- Option C: Correct.
- Option D: Rs. 5,000 — Miscalculates ratio or total.

Final Answer: R's share = Rs. 4,200 $\Rightarrow$ **C**

Answer: (C) [Go Back to Q33](#)



Q34.

Solution

Concept — Ratio and Linear Equations: Let $A = 5k$ and $B = 7k$; form equation from new ratio. **Step 1 — Set up equation:** $\frac{5k + 18}{7k - 10} = \frac{9}{11}$. **Step 2 — Cross**

multiply: $11(5k + 18) = 9(7k - 10) \Rightarrow 55k + 198 = 63k - 90 \Rightarrow 8k = 288 \Rightarrow k = 36$.

Step 3 — Find A: $A = 5 \times 36 = 180$. **Why other options are wrong:**

- Option A: 90 — Uses $k = 18$ from a sign error.
- Option B: 126 — Computes $B = 7k$, not A .
- Option C: 150 — Derives $k = 30$, from incorrect cross multiplication.
- Option D: Correct.

Final Answer: Original value of $A = 180 \Rightarrow \boxed{D}$

Answer: (D) [Go Back to Q34](#)

Q35.

Solution

Concept — Right Triangle Area (Pythagoras + Area): First find the missing leg, then compute area. **Step 1 — Find other leg:** By Pythagoras: $\text{leg}^2 = 10^2 - 6^2 =$

$100 - 36 = 64 \Rightarrow \text{leg} = 8 \text{ cm}$. **Step 2 — Calculate area:** $\text{Area} = \frac{1}{2} \times 6 \times 8 = 24 \text{ cm}^2$.

Why other options are wrong:

- Option A: Correct.
- Option B: 30 cm^2 — Uses $\frac{1}{2} \times 6 \times 10$ (base $\times$ hypotenuse, not base $\times$ height).
- Option C: 36 cm^2 — Uses 6×6 or similar error.
- Option D: 40 cm^2 — Uses $\frac{1}{2} \times 8 \times 10$ (hypotenuse as height).

Final Answer: $\text{Area} = 24 \text{ cm}^2 \Rightarrow \boxed{A}$

Answer: (A) [Go Back to Q35](#)



Q36.

Solution

Concept — Area of Trapezium: $\text{Area} = \frac{1}{2} \times (\text{sum of parallel sides}) \times \text{height}$. **Step**

1 — Substitute values: $\text{Area} = \frac{1}{2} \times (12 + 8) \times 5 = \frac{1}{2} \times 20 \times 5 = 50 \text{ cm}^2$. **Why other options are wrong:**

- Option A: 40 cm^2 — Uses only one parallel side: $\frac{1}{2} \times 16 \times 5 = 40$, or 8×5 .
- Option B: Correct.
- Option C: 60 cm^2 — Uses 12×5 , forgetting the half and omitting the smaller side.
- Option D: 100 cm^2 — Omits the $\frac{1}{2}$ factor entirely: $20 \times 5 = 100$.

Final Answer: Area of trapezium = $50 \text{ cm}^2 \Rightarrow \boxed{\text{B}}$

Answer: (B) [Go Back to Q36](#)

Q37.

Solution

Concept — Total Surface Area of Sphere: $\text{TSA} = 4\pi r^2$. **Step 1 — Substitute values:** $\text{TSA} = 4 \times \frac{22}{7} \times 7^2 = 4 \times \frac{22}{7} \times 49 = 4 \times 22 \times 7 = 4 \times 154 = 616 \text{ cm}^2$. **Why other options are wrong:**

- Option A: 154 cm^2 — Area of a circle with $r = 7$; uses πr^2 instead of $4\pi r^2$.
- Option B: 308 cm^2 — Uses $2\pi r^2$; formula for hemisphere TSA without base.
- Option C: Correct.
- Option D: 1232 cm^2 — Doubles the correct answer; uses $8\pi r^2$ in error.

Final Answer: TSA of sphere = $616 \text{ cm}^2 \Rightarrow \boxed{\text{C}}$

Answer: (C) [Go Back to Q37](#)



Q38.

Solution

Concept — Permutation (Linear Arrangement): Number of arrangements of n distinct objects $= n!$. **Step 1 — Calculate:** $4! = 4 \times 3 \times 2 \times 1 = 24$. **Why other**

options are wrong:

- Option A: 8 — Computes 2^3 or assumes only 3 positions matter.
- Option B: 12 — Computes 4×3 (permutation of 2 from 4), not all 4.
- Option C: 16 — Computes 4^2 ; treats each position independently with replacement.
- Option D: Correct.

Final Answer: Number of arrangements $= 24 \Rightarrow$ D

Answer: (D) [Go Back to Q38](#)

Q39.

Solution

Concept — Probability with Two Dice: Favourable outcomes for sum $= 7$ out of total 36. **Step 1 — List favourable outcomes:**

$(1, 6), (2, 5), (3, 4), (4, 3), (5, 2), (6, 1)$ — 6 outcomes. **Step 2 — Calculate proba-**

bility: $P = \frac{6}{36} = \frac{1}{6}$. **Why other options are wrong:**

- Option A: Correct.
- Option B: $\frac{1}{12}$ — Counts only 3 outcomes (halves the favourable count).
- Option C: $\frac{1}{4}$ — Counts 9 outcomes; over-counts the favourable pairs.
- Option D: $\frac{7}{36}$ — Counts 7 pairs instead of 6; includes an extra pair by error.

Final Answer: $P(\text{sum} = 7) = \frac{1}{6} \Rightarrow$ A

Answer: (A) [Go Back to Q39](#)



Q40.

Solution

Concept — Mode of a Data Set: Mode is the value that appears most frequently.

Step 1 — Count frequencies: Data: 4, 7, 2, 9, 4, 7, 4, 8, 3, 7, 4.

- 4 appears: 4 times
- 7 appears: 3 times
- Others (2, 3, 8, 9): 1 time each

Step 2 — Identify mode: 4 has the highest frequency (4 times). **Why other options are wrong:**

- Option A: 7 — Second most frequent (3 times), not the mode.
- Option B: Correct.
- Option C: 9 — Appears only once.
- Option D: 3 — Appears only once.

Final Answer: Mode = 4 $\Rightarrow$ B

Answer: (B) [Go Back to Q40](#)



Answer Key

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

