

KMAT Quantitative Ability

Sample Paper – 2

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. In an examination, 65% of 400 students passed. How many students failed?

- (A) 260
- (B) 200
- (C) 180
- (D) 140

Q2. A number is increased by 25% and then decreased by 20%. What is the net change?

- (A) No net change (0%)



- (B) 5% increase
- (C) 5% decrease
- (D) 10% increase

Q3. If the price of a commodity increases by 25%, by what percentage must consumption be decreased to keep the expenditure unchanged?

- (A) 15%
- (B) 20%
- (C) 25%
- (D) 30%

Q4. An article is sold at a profit of 8%, realising Rs. 540. What is the cost price?

- (A) Rs. 480
- (B) Rs. 490
- (C) Rs. 500
- (D) Rs. 510

Q5. An article is bought for Rs. 400, marked up by 50%, and then sold at a 20% discount on the marked price. What is the profit percentage?



- (A) 15%
- (B) 18%
- (C) 22%
- (D) 20%

Q6. A train travelling at 72 km/h has a length of 200 m. How many seconds does it take to cross a stationary pole?

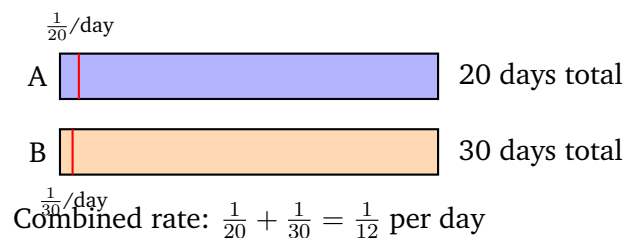


- (A) 10 seconds
- (B) 12 seconds
- (C) 15 seconds
- (D) 8 seconds

Q7. A boat's speed in still water is 15 km/h and the speed of the stream is 5 km/h. How long will the boat take to travel 40 km downstream?

- (A) 3 hours
- (B) 2 hours
- (C) 1.5 hours
- (D) 2.5 hours

Q8. A can complete a piece of work in 20 days and B can do it in 30 days. They work together for 6 days, after which A leaves. In how many additional days does B alone complete the remaining work?



- (A) 8 days
- (B) 12 days
- (C) 15 days
- (D) 10 days

Q9. Pipes A and B together fill a tank in 12 hours. Pipe A alone fills it in 20 hours. How long does Pipe B alone take to fill the tank?

- (A) 15 hours
- (B) 20 hours



- (C) 25 hours
- (D) 30 hours

Q10. A sum of Rs. 8,000 earns Rs. 2,400 as simple interest at 6% per annum. For how many years was the sum invested?

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

Q11. Find the compound interest on Rs. 10,000 at 5% per annum for 2 years.

- (A) Rs. 1,000
- (B) Rs. 1,025
- (C) Rs. 1,050
- (D) Rs. 1,100

Q12. A 30-litre solution has milk and water in the ratio 2 : 1. How many litres of water must be added to make the ratio 1 : 1?

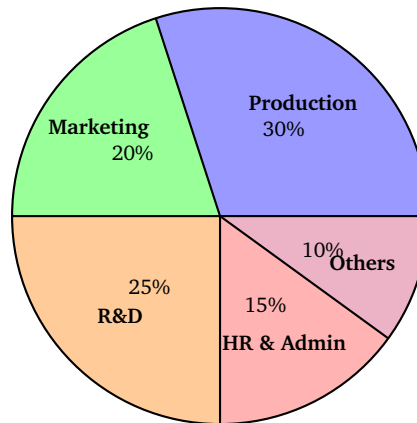
- (A) 5 litres
- (B) 8 litres
- (C) 10 litres
- (D) 15 litres

Q13. A shopkeeper marks goods 30% above cost price and then gives a 15% discount. What is the profit percentage?

- (A) 8%
- (B) 9%
- (C) 9.5%
- (D) 10.5%



Directions (Q14–Q17): The pie chart below shows the allocation of an annual budget of Rs. 120 crore across five departments. Study it carefully and answer the questions that follow.



Total Budget = Rs. 120 crore

- Q14.** What is the ratio of the Production budget to the R&D budget?
- (A) 6 : 5
(B) 5 : 6
(C) 3 : 2
(D) 2 : 3
- Q15.** By how many crores does the Marketing budget exceed the Others budget?
- (A) Rs. 8 crore
(B) Rs. 12 crore
(C) Rs. 16 crore
(D) Rs. 20 crore
- Q16.** If the R&D allocation is increased by 20%, what is the new R&D budget (in Rs. crore)?
- (A) Rs. 30 crore

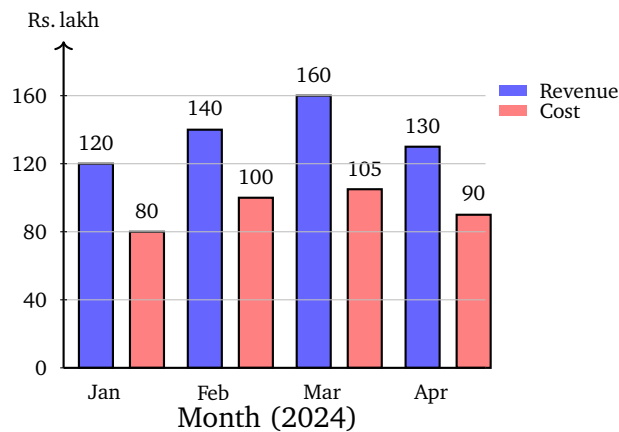


- (B) Rs. 33 crore
- (C) Rs. 36 crore
- (D) Rs. 42 crore

Q17. HR & Admin constitutes what percentage of the total budget?

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

Directions (Q18–Q21): The bar chart below shows the monthly Revenue and Cost (in Rs. lakh) of a company for January through April 2024. Study it carefully and answer the questions that follow.



Q18. What is the average monthly revenue for the four months January to April?

- (A) Rs. 137.5 lakh
- (B) Rs. 140 lakh
- (C) Rs. 130 lakh
- (D) Rs. 145 lakh

Q19. In which month was the profit (Revenue – Cost) the highest?



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

Q20. What is the total cost incurred over the four months?

- (A) Rs. 350 lakh
- (B) Rs. 365 lakh
- (C) Rs. 375 lakh
- (D) Rs. 400 lakh

Q21. What is the percentage increase in Revenue from January to March?

- (A) 20%
- (B) 25%
- (C) 30%
- (D) 33.33%

Q22. What is the LCM of 4, 6, 8, and 12?

- (A) 24
- (B) 48
- (C) 36
- (D) 96

Q23. What is the HCF of 56 and 84?

- (A) 14
- (B) 28
- (C) 42
- (D) 56



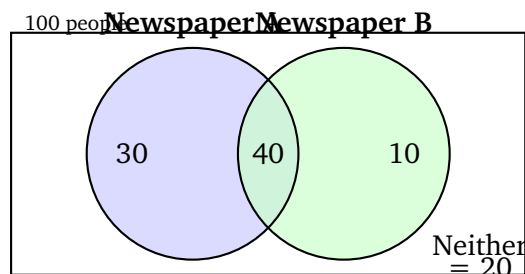
Q24. Two numbers are in the ratio 3 : 5 and their LCM is 75. Find their HCF.

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

Q25. How many prime numbers are there between 1 and 30?

- (A) 8
- (B) 9
- (C) 11
- (D) 10

Q26. Out of 100 people, 70 read Newspaper A, 50 read Newspaper B, and 40 read both. How many read neither?



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

Q27. If α and β are the roots of $x^2 - 7x + 12 = 0$, find $\alpha^2 + \beta^2$.

- (A) 37
- (B) 25
- (C) 49



(D) 12

Q28. The arithmetic mean of 10 numbers is 5. If one of the numbers (which equals 5) is replaced by 15, what is the new mean?

(A) 5.5

(B) 5.8

(C) 6

(D) 6.5

Q29. Find the 5th term of a geometric progression whose first term is 2 and common ratio is 3.

(A) 81

(B) 108

(C) 54

(D) 162

Q30. Solve the simultaneous equations $2x + y = 10$ and $x - y = 2$. Find the product xy .

(A) 8

(B) 12

(C) 6

(D) 10

Q31. Rs. 2,100 is divided among P, Q, and R in the ratio 3 : 4 : 7. What is Q's share?

(A) Rs. 450

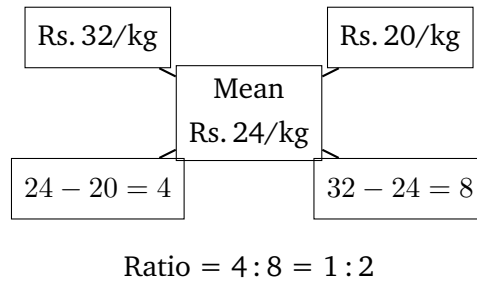
(B) Rs. 600

(C) Rs. 900

(D) Rs. 1,050



Q32. In what ratio should sugar at Rs. 32 per kg be mixed with sugar at Rs. 20 per kg to obtain a blend costing Rs. 24 per kg?



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

Q33. A, B, and C invest Rs. 2,000, Rs. 3,000, and Rs. 5,000 respectively in a business for equal periods. Total profit = Rs. 2,000. What is C's share?

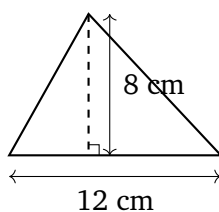
- (A) Rs. 500
- (B) Rs. 600
- (C) Rs. 800
- (D) Rs. 1,000

Q34. Present ages of A and B are 30 and 50 years respectively. After how many years will the ratio of their ages be 2 : 3?

- (A) 10 years
- (B) 12 years
- (C) 15 years
- (D) 20 years

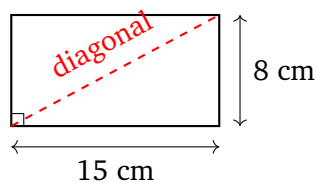
Q35. Find the area of a triangle with base 12 cm and height 8 cm.





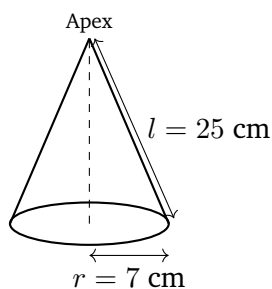
- (A) 96 cm^2
- (B) 48 cm^2
- (C) 72 cm^2
- (D) 36 cm^2

Q36. A rectangle has length 15 cm and breadth 8 cm. Find the length of its diagonal.



- (A) 12 cm
- (B) 14 cm
- (C) 17 cm
- (D) 20 cm

Q37. A cone has base radius 7 cm and slant height 25 cm. Find its total surface area. (Use $\pi = \frac{22}{7}$)

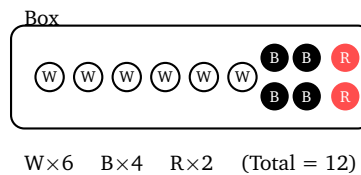


- (A) 440 cm^2
- (B) 616 cm^2
- (C) 528 cm^2
- (D) 704 cm^2

Q38. In how many ways can 3 students be selected from a group of 8 for a prize committee?

- (A) 56
- (B) 112
- (C) 336
- (D) 28

Q39. A box contains 6 white, 4 black, and 2 red balls. A ball is drawn at random. What is the probability that the ball is NOT black?



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

Q40. Find the median of the following data set: 5, 8, 2, 14, 11, 7, 3, 16.

- (A) 8
- (B) 9
- (C) 7.5
- (D) 11



Detailed Solutions

Q1.

Solution

Concept — Percentage: Number of students who failed = Total – Passed. **Step**

1 — Find students who passed: 65% of $400 = \frac{65}{100} \times 400 = 260$ students passed.

Step 2 — Find students who failed: Failed = $400 - 260 = 140$. **Why other**

options are wrong:

- Option A: 260 is the number who *passed*, not failed.
- Option B: 200 would imply 50% passed, not 65%.
- Option C: 180 would imply 55% passed.
- Option D: **Correct.** $400 - 260 = 140$.

Final Answer: 140 students failed $\Rightarrow$ D

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

Q2.

Solution

Concept — Successive Percentage Change: Net factor = $(1+r_1)(1+r_2) - 1$. **Step**

1 — Apply successive changes: Factor = $(1+0.25)(1-0.20) = 1.25 \times 0.80 = 1.00$.

Step 2 — Net change: Net change = $1.00 - 1 = 0$, i.e. no net change. **Why other**

options are wrong:

- Option A: **Correct.** The two changes exactly cancel.
- Option B: 5% increase would require factor 1.05.
- Option C: 5% decrease would require factor 0.95.
- Option D: 10% increase would require factor 1.10.

Final Answer: No net change (0%) $\Rightarrow$ A

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



Q3.

Solution

Concept — Percentage: If price increases by $r\%$, consumption must decrease by $\frac{r}{100 + r} \times 100\%$ to keep expenditure constant. **Step 1 — Apply formula:** Required

decrease = $\frac{25}{100 + 25} \times 100 = \frac{25}{125} \times 100 = 20\%$. **Why other options are wrong:**

- Option A: 15% is too low.
- Option B: **Correct.** 20% is the exact answer.
- Option C: 25% equals the price rise — this would over-compensate.
- Option D: 30% is excessive.

Final Answer: 20% decrease in consumption $\Rightarrow$ B

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

Q4.

Solution

Concept — Profit & Loss: $SP = CP \times \left(1 + \frac{\text{Profit}\%}{100}\right)$, so $CP = \frac{SP}{1 + \text{Profit}\%/100}$. **Step 1 —**

Compute CP: $CP = \frac{540}{1.08} = 500$. **Why other options are wrong:**

- Option A: Rs. 480 $\Rightarrow$ SP would be $480 \times 1.08 = 518.4 \neq 540$.
- Option B: Rs. 490 $\Rightarrow$ SP would be $490 \times 1.08 = 529.2 \neq 540$.
- Option C: **Correct.** $500 \times 1.08 = 540$.
- Option D: Rs. 510 $\Rightarrow$ SP would be $510 \times 1.08 = 550.8 \neq 540$.

Final Answer: Cost Price = Rs. 500 $\Rightarrow$ C

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

Q5.

Solution

Concept — Marked Price & Discount: $MP = CP \times (1 + \text{Markup}\%)$; $SP = MP \times (1 - \text{Discount}\%)$. **Step 1 — Find Marked Price:** $MP = 400 \times 1.50 = 600$. **Step 2**

— Find Selling Price: $SP = 600 \times 0.80 = 480$. **Step 3 — Find Profit %:** Profit = $480 - 400 = 80$. Profit% = $\frac{80}{400} \times 100 = 20\%$. **Why other options are wrong:**

- Option A: 15% would give $SP = \text{Rs. } 460$.



- Option B: 18% would give SP = Rs. 472.
- Option C: 22% would give SP = Rs. 488.
- Option D: **Correct.** SP = Rs. 480, profit = 20%.

Final Answer: Profit Percentage = 20% $\Rightarrow$ D

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

Q6.

Solution

Concept — Time Speed Distance: Time to cross a pole = $\frac{\text{Length of train}}{\text{Speed}}$. **Step**

1 — Convert speed: $72 \text{ km/h} = 72 \times \frac{5}{18} = 20 \text{ m/s}$. **Step 2 — Compute time:**

$t = \frac{200}{20} = 10 \text{ s}$. **Why other options are wrong:**

- Option A: **Correct.** 10 seconds.
- Option B: 12 s would imply speed = $200/12 \approx 16.7 \text{ m/s}$.
- Option C: 15 s would imply speed $\approx 13.3 \text{ m/s}$.
- Option D: 8 s would imply speed = $25 \text{ m/s} = 90 \text{ km/h}$.

Final Answer: Time = 10 seconds $\Rightarrow$ A

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

Q7.

Solution

Concept — Boats & Streams: Downstream speed = Still water speed + Stream speed. **Step 1 — Find downstream speed:** $15 + 5 = 20 \text{ km/h}$. **Step 2 — Find**

time: $t = \frac{40}{20} = 2 \text{ hours}$. **Why other options are wrong:**

- Option A: 3 hours would require downstream speed $\approx 13.3 \text{ km/h}$.
- Option B: **Correct.** 2 hours at 20 km/h .
- Option C: 1.5 hours would require 26.7 km/h .
- Option D: 2.5 hours would require 16 km/h .

Final Answer: Time = 2 hours $\Rightarrow$ B

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



Q8.

Solution

Concept — Time & Work: Combined rate = sum of individual rates; track remaining work after partial completion. **Step 1 — Combined rate:** A does $\frac{1}{20}$ /day, B does $\frac{1}{30}$ /day. Together: $\frac{1}{20} + \frac{1}{30} = \frac{3+2}{60} = \frac{1}{12}$ /day. **Step 2 — Work done in 6 days (together):** $6 \times \frac{1}{12} = \frac{1}{2}$. Remaining work = $\frac{1}{2}$. **Step 3 — B alone for remaining:** $\frac{1}{2} \div \frac{1}{30} = 15$ days. **Why other options are wrong:**

- Option A: 8 days would leave $8 \times \frac{1}{30} = \frac{4}{15} \neq \frac{1}{2}$.
- Option B: 12 days gives $\frac{12}{30} = \frac{2}{5} \neq \frac{1}{2}$.
- Option C: **Correct.** $15 \times \frac{1}{30} = \frac{1}{2}$.
- Option D: 10 days gives $\frac{10}{30} = \frac{1}{3} \neq \frac{1}{2}$.

Final Answer: B needs 15 more days $\Rightarrow$ C

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

Q9.

Solution

Concept — Pipes & Cisterns: $\frac{1}{B} = \frac{1}{\text{Together}} - \frac{1}{A}$. **Step 1 — Find B's rate:** $\frac{1}{B} = \frac{1}{12} - \frac{1}{20} = \frac{5-3}{60} = \frac{2}{60} = \frac{1}{30}$. **Step 2 — B's time:** $B = 30$ hours. **Why other options are wrong:**

- Option A: 15 h $\Rightarrow$ combined = $\frac{1}{20} + \frac{1}{15} = \frac{7}{60} \neq \frac{1}{12}$.
- Option B: 20 h $\Rightarrow$ combined = $\frac{1}{20} + \frac{1}{20} = \frac{1}{10} \neq \frac{1}{12}$.
- Option C: 25 h $\Rightarrow$ combined $\approx \frac{9}{100} \neq \frac{1}{12}$.
- Option D: **Correct.** $\frac{1}{20} + \frac{1}{30} = \frac{5}{60} = \frac{1}{12}$.

Final Answer: Pipe B alone takes 30 hours $\Rightarrow$ D

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



Q10.

Solution

Concept — Simple Interest: $T = \frac{SI \times 100}{P \times R}$. **Step 1 — Substitute values:** $T =$

$$\frac{2400 \times 100}{8000 \times 6} = \frac{240000}{48000} = 5 \text{ years. Why other options are wrong:}$$

- Option A: **Correct.** $T = 5$ years.
- Option B: 4 years $\Rightarrow SI = 8000 \times 6 \times 4/100 = 1920 \neq 2400$.
- Option C: 3 years $\Rightarrow SI = 1440 \neq 2400$.
- Option D: 6 years $\Rightarrow SI = 2880 \neq 2400$.

Final Answer: Time = 5 years $\Rightarrow$ A

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

Q11.

Solution

Concept — Compound Interest: $A = P \left(1 + \frac{r}{100}\right)^n$; $CI = A - P$. **Step 1 —**

Find amount: $A = 10000 \times (1.05)^2 = 10000 \times 1.1025 = 11025$. **Step 2 — Find CI:**

$CI = 11025 - 10000 = 1025$. **Why other options are wrong:**

- Option A: Rs. 1000 is simple interest for 2 years.
- Option B: **Correct.** $CI = \text{Rs. } 1025$.
- Option C: Rs. 1050 would arise from 5% simple interest for 2 years on a different base.
- Option D: Rs. 1100 would require a higher rate.

Final Answer: Compound Interest = Rs. 1,025 $\Rightarrow$ B

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



Q12.

Solution

Concept — Mixture: Find current quantities; adding water increases the water part to equal milk. **Step 1 — Current quantities:** Total = 30 L; ratio 2:1. Milk = 20 L, Water = 10 L. **Step 2 — Find water to add:** For ratio 1:1, milk = water. Milk stays 20 L, so water must also be 20 L. Water to add = $20 - 10 = 10$ L. **Why other options are wrong:**

- Option A: Adding 5 L gives water = 15 L; ratio = $20:15 = 4:3$, not 1:1.
- Option B: Adding 8 L gives water = 18 L; not equal to 20 L.
- Option C: **Correct.** Adding 10 L gives water = 20 L = milk.
- Option D: Adding 15 L gives water = 25 L $>$ milk.

Final Answer: 10 litres of water must be added $\Rightarrow$ C

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

Q13.

Solution

Concept — Marked Price & Discount: Net factor = $(1 + M)(1 - D)$ where M = markup fraction, D = discount fraction. **Step 1 — Net selling factor on CP:** $(1.30) \times (0.85) = 1.105$. **Step 2 — Profit %:** $1.105 - 1 = 0.105 = 10.5\%$. **Why other options are wrong:**

- Option A: 8% would give factor 1.08.
- Option B: 9% would give factor 1.09.
- Option C: 9.5% would give factor 1.095.
- Option D: **Correct.** $1.30 \times 0.85 = 1.105$, profit = 10.5%.

Final Answer: Profit = 10.5% $\Rightarrow$ D

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



Q14.

Solution

Concept — Data Interpretation (Pie Chart): Budget of each department = Percentage $\times$ Total. **Step 1 — Find budgets:** Production = $30\% \times 120 = 36$ cr. R&D = $25\% \times 120 = 30$ cr. **Step 2 — Find ratio:** Production : R&D = $36 : 30 = 6 : 5$.

Why other options are wrong:

- Option A: **Correct.** 6:5.
- Option B: 5:6 is the inverse ratio.
- Option C: 3:2 equals ratio of 30%:20%, not 30%:25%.
- Option D: 2:3 is the inverse of 3:2.

Final Answer: Production : R&D = $6 : 5 \Rightarrow$ A

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

Q15.

Solution

Concept — Data Interpretation (Pie Chart): Compute individual budgets and find the difference. **Step 1 — Marketing budget:** $20\% \times 120 = 24$ cr. **Step 2 —**

Others budget: $10\% \times 120 = 12$ cr. **Step 3 — Difference:** $24 - 12 = 12$ cr. **Why**

other options are wrong:

- Option A: Rs. 8 cr — incorrect arithmetic.
- Option B: **Correct.** Rs. 12 cr.
- Option C: Rs. 16 cr — incorrect.
- Option D: Rs. 20 cr — incorrect.

Final Answer: Marketing exceeds Others by Rs. 12 crore $\Rightarrow$ B

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



Q16.

Solution

Concept — Data Interpretation (Pie Chart): New value = original value $\times$ (1 + increase%). **Step 1 — Current R&D budget:** $25\% \times 120 = 30$ cr. **Step 2 —**

New R&D budget after 20% increase: $30 \times 1.20 = 36$ cr. **Why other options are wrong:**

- Option A: Rs. 30 cr — unchanged amount.
- Option B: Rs. 33 cr — 10% increase, not 20%.
- Option C: **Correct.** $30 \times 1.2 = 36$ cr.
- Option D: Rs. 42 cr — 40% increase.

Final Answer: New R&D Budget = Rs. 36 crore $\Rightarrow$ **C**

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

Q17.

Solution

Concept — Data Interpretation (Pie Chart): Read percentage directly from pie chart. **Step 1 — Read HR & Admin sector:** The pie chart labels HR & Admin as

15% of the total budget. **Why other options are wrong:**

- Option A: 10% is Others.
- Option B: 20% is Marketing.
- Option C: 25% is R&D.
- Option D: **Correct.** 15% is HR & Admin.

Final Answer: HR & Admin = 15% $\Rightarrow$ **D**

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



Q18.

Solution

Concept — Data Interpretation (Bar Chart): Average = Total ÷ Number of months. **Step 1 — Sum of revenues:** $120 + 140 + 160 + 130 = 550$ lakh. **Step 2 —**

Average: $\frac{550}{4} = 137.5$ lakh. **Why other options are wrong:**

- Option A: **Correct.** Rs. 137.5 lakh.
- Option B: Rs. 140 lakh — this is only February's revenue.
- Option C: Rs. 130 lakh — this is only April's revenue.
- Option D: Rs. 145 lakh — overestimate.

Final Answer: Average monthly revenue = Rs. 137.5 lakh $\Rightarrow$ **A**

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

Q19.

Solution

Concept — Data Interpretation (Bar Chart): Profit = Revenue – Cost; compare across months. **Step 1 — Compute monthly profits:** Jan: $120 - 80 = 40$; Feb: $140 - 100 = 40$; Mar: $160 - 105 = 55$; Apr: $130 - 90 = 40$. **Step 2 — Identify maximum:** March has profit Rs. 55 lakh — highest. **Why other options are wrong:**

- Option A: January profit = Rs. 40 lakh.
- Option B: **Correct.** March profit = Rs. 55 lakh (highest).
- Option C: February profit = Rs. 40 lakh.
- Option D: April profit = Rs. 40 lakh.

Final Answer: Highest profit in March $\Rightarrow$ **B**

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



Q20.

Solution

Concept — Data Interpretation (Bar Chart): Total cost = sum of monthly costs.

Step 1 — Sum of costs: $80 + 100 + 105 + 90 = 375$ lakh. **Why other options are**

wrong:

- Option A: Rs. 350 lakh — undercount.
- Option B: Rs. 365 lakh — arithmetic error.
- Option C: **Correct.** $80 + 100 + 105 + 90 = 375$ lakh.
- Option D: Rs. 400 lakh — overcount.

Final Answer: Total Cost = Rs. 375 lakh $\Rightarrow$ C

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

Q21.

Solution

Concept — Data Interpretation (Bar Chart): % increase = $\frac{\text{New} - \text{Old}}{\text{Old}} \times 100$.

Step 1 — Compute: January revenue = 120; March revenue = 160. Increase = $160 - 120 = 40$. **Step 2 — Percentage:** $\frac{40}{120} \times 100 = 33.\bar{3}\%$. **Why other options**

are wrong:

- Option A: 20% would give increase of 24, not 40.
- Option B: 25% would give increase of 30.
- Option C: 30% would give increase of 36.
- Option D: **Correct.** $\frac{40}{120} \times 100 = 33.33\%$.

Final Answer: Revenue increase Jan to Mar = 33.33% $\Rightarrow$ D

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



Q22.

Solution

Concept — LCM: LCM is the smallest number divisible by all given numbers. **Step**

1 — Prime factorisation: $4 = 2^2$; $6 = 2 \times 3$; $8 = 2^3$; $12 = 2^2 \times 3$. **Step 2 — LCM:**

Take highest powers: $2^3 \times 3 = 24$. **Why other options are wrong:**

- Option A: **Correct.** LCM = 24.
- Option B: 48 is a common multiple but not the *least*.
- Option C: 36 is not divisible by 8.
- Option D: 96 is a common multiple but not the least.

Final Answer: LCM = 24 $\Rightarrow$ A

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

Q23.

Solution

Concept — HCF: HCF is the greatest number that divides all given numbers. **Step**

1 — Prime factorisation: $56 = 2^3 \times 7$; $84 = 2^2 \times 3 \times 7$. **Step 2 — HCF:** Take

lowest powers of common factors: $2^2 \times 7 = 28$. **Why other options are wrong:**

- Option A: 14 divides both but is not the *greatest*.
- Option B: **Correct.** HCF = 28.
- Option C: 42 does not divide 56.
- Option D: 56 does not divide 84.

Final Answer: HCF of 56 and 84 = 28 $\Rightarrow$ B

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

Q24.

Solution

Concept — HCF & LCM: If two numbers are $3k$ and $5k$, their LCM = $15k$ and HCF = k . **Step 1 — Find k from LCM:** LCM = $15k = 75 \Rightarrow k = 5$. **Step 2 — HCF =**

$k = 5$. **Verification:** Numbers are 15 and 25. HCF(15, 25) = 5, LCM(15, 25) = 75.

✓ **Why other options are wrong:**



- Option A: 3 gives numbers 9,15; $\text{LCM} = 45 \neq 75$.
- Option B: 4 gives numbers 12,20; $\text{LCM} = 60 \neq 75$.
- Option C: **Correct.** $\text{HCF} = 5$.
- Option D: 6 gives numbers 18,30; $\text{LCM} = 90 \neq 75$.

Final Answer: $\text{HCF} = 5 \Rightarrow \boxed{\text{C}}$

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

Q25.

Solution

Concept — Prime Numbers: A prime number has exactly two distinct factors: 1 and itself. **Step 1 — List primes between 1 and 30:** 2, 3, 5, 7, 11, 13, 17, 19, 23, 29. **Step 2 — Count:** There are 10 primes. **Why other options are wrong:**

- Option A: 8 — misses some primes.
- Option B: 9 — misses one prime.
- Option C: 11 — includes 1, which is not prime.
- Option D: **Correct.** 10 primes.

Final Answer: 10 prime numbers between 1 and 30 $\Rightarrow \boxed{\text{D}}$

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

Q26.

Solution

Concept — Set Theory (Venn Diagram): $n(A \cup B) = n(A) + n(B) - n(A \cap B)$; $\text{Neither} = n(U) - n(A \cup B)$. **Step 1 — Compute union:** $n(A \cup B) = 70 + 50 - 40 = 80$.

Step 2 — Find neither: $100 - 80 = 20$. **Why other options are wrong:**

- Option A: **Correct.** $\text{Neither} = 20$.
- Option B: 15 — arithmetic error.
- Option C: 25 — uses wrong inclusion-exclusion.
- Option D: 10 — takes only the intersection as neither.

Final Answer: 20 people read neither newspaper $\Rightarrow \boxed{\text{A}}$

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



Q27.

Solution

Concept — Quadratic Equations: For roots α, β : sum = $-b/a = 7$, product = $c/a = 12$. $\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta$. **Step 1 — Identify sums and products:**

$\alpha + \beta = 7$, $\alpha\beta = 12$. **Step 2 — Compute:** $\alpha^2 + \beta^2 = 7^2 - 2(12) = 49 - 24 = 25$.

Why other options are wrong:

- Option A: $37 = 49 - 12$ (subtracts product once instead of twice).
- Option B: **Correct.** $49 - 24 = 25$.
- Option C: $49 = (\alpha + \beta)^2$ without subtracting $2\alpha\beta$.
- Option D: 12 is just the product of the roots.

Final Answer: $\alpha^2 + \beta^2 = 25 \Rightarrow$ B

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

Q28.

Solution

Concept — Arithmetic Mean: Total sum = Mean $\times$ Count; update sum then recompute mean. **Step 1 — Original total sum:** $5 \times 10 = 50$. **Step 2 — New sum**

after replacement: Remove 5, add 15. New sum = $50 - 5 + 15 = 60$. **Step 3 —**

New mean: $60 \div 10 = 6$. **Why other options are wrong:**

- Option A: 5.5 would require new sum = 55.
- Option B: 5.8 would require new sum = 58.
- Option C: **Correct.** New mean = 6.
- Option D: 6.5 would require new sum = 65.

Final Answer: New mean = 6 $\Rightarrow$ C

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



Q29.

Solution

Concept — Geometric Progression: $T_n = a \cdot r^{n-1}$. **Step 1 — Apply formula:**

$T_5 = 2 \times 3^{5-1} = 2 \times 3^4 = 2 \times 81 = 162$. **Why other options are wrong:**

- Option A: $81 = 3^4$ (misses multiplying by $a = 2$).
- Option B: $108 = 4 \times 27$ (wrong term calculation).
- Option C: $54 = 2 \times 27 = T_4$, the 4th term not the 5th.
- Option D: **Correct.** $T_5 = 162$.

Final Answer: 5th term = 162 $\Rightarrow$ D

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

Q30.

Solution

Concept — Simultaneous Equations: Solve by elimination or substitution; find xy . **Step 1 — Add the equations:** $(2x + y) + (x - y) = 10 + 2 \Rightarrow 3x = 12 \Rightarrow x = 4$.

Step 2 — Find y: $x - y = 2 \Rightarrow 4 - y = 2 \Rightarrow y = 2$. **Step 3 — Find product:**

$xy = 4 \times 2 = 8$. **Why other options are wrong:**

- Option A: **Correct.** $xy = 8$.
- Option B: 12 — wrong value of x or y .
- Option C: 6 — arithmetic error.
- Option D: 10 — arithmetic error.

Final Answer: $xy = 8 \Rightarrow$ A

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

Q31.

Solution

Concept — Ratio & Proportion: Each share = $\frac{\text{individual ratio}}{\text{total ratio}} \times \text{total amount}$.

Step 1 — Total ratio parts: $3 + 4 + 7 = 14$. **Step 2 — Q's share:** $\frac{4}{14} \times 2100 =$

$\frac{4 \times 2100}{14} = \frac{8400}{14} = 600$. **Why other options are wrong:**



- Option A: Rs. 450 = P's share ($\frac{3}{14} \times 2100 = 450$).
- Option B: **Correct.** Q's share = Rs. 600.
- Option C: Rs. 900 corresponds to 6 parts, not 4.
- Option D: Rs. 1050 = R's share ($\frac{7}{14} \times 2100$).

Final Answer: Q's share = Rs. 600 $\Rightarrow$ **B**

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

Q32.

Solution

Concept — Alligation: The mixing ratio = (Mean price – Cheaper price) : (Costlier price – Mean price). **Step 1 — Apply alligation rule:** Ratio of Rs. 32 sugar : Rs. 20 sugar = $(24 - 20) : (32 - 24) = 4 : 8 = 1 : 2$. **Why other options are wrong:**

- Option A: 2:1 is the inverse; would give mean = $(2 \times 32 + 1 \times 20) / 3 = 28 \neq 24$.
- Option B: 3:2 gives mean = $(3 \times 32 + 2 \times 20) / 5 = (96 + 40) / 5 = 27.2 \neq 24$.
- Option C: **Correct.** 1:2 gives mean = $(1 \times 32 + 2 \times 20) / 3 = 72 / 3 = 24$.
- Option D: 2:3 gives mean = $(2 \times 32 + 3 \times 20) / 5 = (64 + 60) / 5 = 24.8 \neq 24$.

Final Answer: Required ratio = 1 : 2 $\Rightarrow$ **C**

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

Q33.

Solution

Concept — Partnership: Profit is shared in ratio of investments (equal time periods). **Step 1 — Investment ratio:** A:B:C = 2000 : 3000 : 5000 = 2 : 3 : 5. **Step 2**

— Total parts: $2 + 3 + 5 = 10$. **Step 3 — C's share:** $\frac{5}{10} \times 2000 = 1000$. **Why other**

options are wrong:

- Option A: Rs. 500 = A's share ($\frac{2}{10} \times 2000$).
- Option B: Rs. 600 = B's share ($\frac{3}{10} \times 2000$).
- Option C: Rs. 800 — no ratio part equals 4.
- Option D: **Correct.** C's share = Rs. 1,000.

Final Answer: C's share = Rs. 1,000 $\Rightarrow$ **D**



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

Q34.

Solution

Concept — Ages: Let x years pass. Set up equation $\frac{30+x}{50+x} = \frac{2}{3}$. **Step 1 — Solve:**
 $3(30+x) = 2(50+x) \Rightarrow 90+3x = 100+2x \Rightarrow x = 10$. **Verification:** Ages after 10 years: A = 40, B = 60. Ratio = 40 : 60 = 2 : 3. ✓ **Why other options are wrong:**

- Option A: **Correct.** 10 years.
- Option B: After 12 years: 42:62 $\neq$ 2:3.
- Option C: After 15 years: 45:65 = 9:13 $\neq$ 2:3.
- Option D: After 20 years: 50:70 = 5:7 $\neq$ 2:3.

Final Answer: After 10 years $\Rightarrow$ **A**

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

Q35.

Solution

Concept — Area of Triangle: Area = $\frac{1}{2} \times \text{base} \times \text{height}$. **Step 1 — Substitute:**
 Area = $\frac{1}{2} \times 12 \times 8 = 48 \text{ cm}^2$. **Why other options are wrong:**

- Option A: $96 \text{ cm}^2 = 12 \times 8$ (forgot the $\frac{1}{2}$).
- Option B: **Correct.** 48 cm^2 .
- Option C: 72 cm^2 — uses wrong fraction or dimensions.
- Option D: 36 cm^2 — uses wrong dimensions.

Final Answer: Area = $48 \text{ cm}^2 \Rightarrow$ **B**

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



Q36.

Solution

Concept — Diagonal of Rectangle: By Pythagoras: $d = \sqrt{l^2 + b^2}$. **Step 1 —**

Substitute: $d = \sqrt{15^2 + 8^2} = \sqrt{225 + 64} = \sqrt{289} = 17$ cm. **Why other options are wrong:**

- Option A: 12 cm — too short; $12^2 = 144 \neq 289$.
- Option B: 14 cm — $14^2 = 196 \neq 289$.
- Option C: **Correct.** $\sqrt{289} = 17$ cm.
- Option D: 20 cm — $20^2 = 400 \neq 289$.

Final Answer: Diagonal = 17 cm $\Rightarrow$ C

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

Q37.

Solution

Concept — Total Surface Area of Cone: $TSA = \pi r(r + l)$ where r = radius, l = slant height. **Step 1 — Substitute:** $TSA = \frac{22}{7} \times 7 \times (7 + 25) = 22 \times 32 = 704$ cm².

Why other options are wrong:

- Option A: 440 cm² = $\pi r l$ (curved surface only, not total).
- Option B: 616 cm² = $\pi r^2 \times 4$ (area of base circle with wrong multiplier).
- Option C: 528 cm² — arithmetic error.
- Option D: **Correct.** $TSA = 22 \times 32 = 704$ cm².

Final Answer: Total Surface Area = 704 cm² $\Rightarrow$ D

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

Q38.

Solution

Concept — Combinations: ${}^nC_r = \frac{n!}{r!(n-r)!}$. **Step 1 — Apply formula:** ${}^8C_3 =$

$\frac{8!}{3! \times 5!} = \frac{8 \times 7 \times 6}{3 \times 2 \times 1} = \frac{336}{6} = 56$. **Why other options are wrong:**

- Option A: **Correct.** ${}^8C_3 = 56$.
- Option B: $112 = 2 \times 56$ — incorrectly doubled.



- Option C: $336 = {}^8P_3$ (permutation, not combination).
- Option D: $28 = {}^8C_2$ (selecting 2, not 3).

Final Answer: Number of ways = 56 $\Rightarrow$ A

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

Q39.

Solution

Concept — Probability: $P(\text{not black}) = 1 - P(\text{black}) = \frac{\text{non-black balls}}{\text{total balls}}$. **Step 1 — Total balls:** $6 + 4 + 2 = 12$. **Step 2 — Non-black balls:** $6 + 2 = 8$. **Step 3 —**

Probability: $P(\text{not black}) = \frac{8}{12} = \frac{2}{3}$. **Why other options are wrong:**

- Option A: $\frac{1}{3} = \frac{4}{12}$ is the probability of drawing a *black* ball.
- Option B: **Correct.** $\frac{8}{12} = \frac{2}{3}$.
- Option C: $\frac{1}{4}$ would require 3 non-black out of 12.
- Option D: $\frac{3}{4}$ would require 9 non-black out of 12.

Final Answer: $P(\text{not black}) = \frac{2}{3} \Rightarrow$ B

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

Q40.

Solution

Concept — Median: Arrange data in ascending order; median = average of the two middle values for even-count data. **Step 1 — Sort the data:** 2, 3, 5, 7, 8, 11, 14, 16. **Step 2 — Find middle values:** 8 values $\Rightarrow$ middle positions are 4th and 5th: values 7 and 8. **Step 3 — Compute median:** $\frac{7+8}{2} = 7.5$. **Why other options are wrong:**

- Option A: 8 — only the 5th value, not the average of 4th and 5th.
- Option B: 9 — arithmetic error in averaging.
- Option C: **Correct.** Median = $\frac{7+8}{2} = 7.5$.
- Option D: 11 — the 6th value in sorted order.

Final Answer: Median = 7.5 $\Rightarrow$ C



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



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	D	10	A
11	B	12	C	13	D	14	A	15	B
16	C	17	D	18	A	19	B	20	C
21	D	22	A	23	B	24	C	25	D
26	A	27	B	28	C	29	D	30	A
31	B	32	C	33	D	34	A	35	B
36	C	37	D	38	A	39	B	40	C

