MAT Data Analysis & Sufficiency Sample Paper-4

Duration: 24 Minutes **Maximum Marks: 30**

Instructions

- This paper contains **30** Multiple Choice Questions from the **Data Analysis & Sufficiency** section of MAT.
- Each correct answer carries **+1 mark**. Incorrect answer: -0.25 marks. Only **one** correct option.
- There is **no** negative marking for unattempted questions.
- Suggested time for this section in the full MAT is **24 minutes**.
- Use of mobile phones, smartwatches, calculators, or any electronic gadgets is strictly prohibited.

SET 1 (Q1–Q5): Composite Table

Directions (Q1–Q5): The table below shows the quarterly sales (in Rs. lakh) of five product categories across four regional stores of a retail chain. Study it carefully and answer the questions.

Quarterly Sales by Product Category and Store (Rs. lakh)

Store	Electronics	Clothing	Grocery	Furniture	Sports
North	48	32	56	24	18
South	62	45	70	30	22
East	35	28	44	18	15
West	55	40	60	26	20
Total	**200**	**145**	**230**	**98**	**75**

Note: All figures represent net sales revenue in Rs. lakh for the quarter.

Q1. What is the total sales revenue (in Rs. lakh) of the South store across all five product categories?

(A) 219

(B) 224

(C) 229

(D) 234

Q2. Grocery sales of the West store is what percentage of total Grocery sales across all four stores? (Round to nearest whole number)

(A) 24%

(B) 26%

(C) 28%

(D) 30%

Q3. The ratio of total Electronics sales to total Sports sales across all stores is:

(A) $7 : 3$

(B) $8 : 3$

(C) $40 : 15$

(D) $200 : 75$

Q4. By how much (in Rs. lakh) does the combined revenue of South and West stores exceed the combined revenue of North and East stores?

(A) 104

(B) 108

(C) 112

(D) 116

Q5. Which product category contributes the highest percentage share to total sales across all stores combined?

(A) Electronics

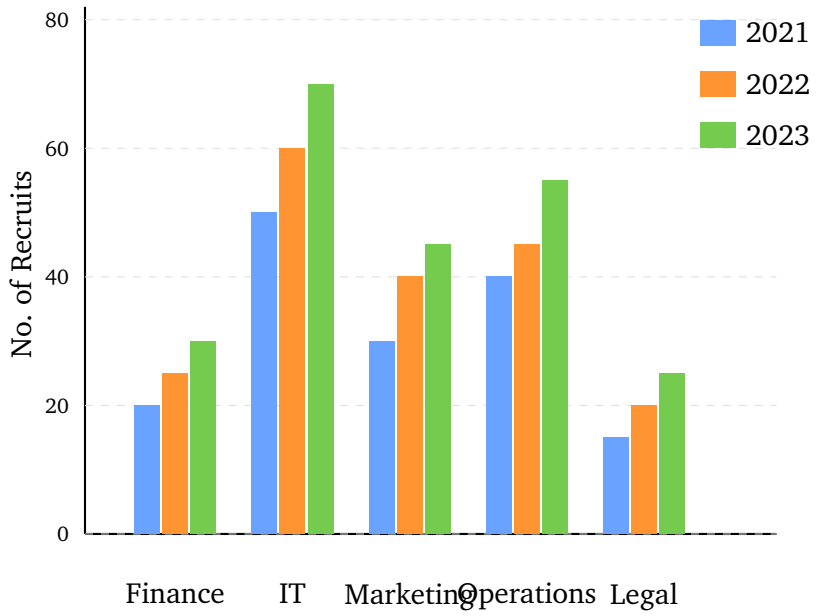
(B) Clothing

(C) Grocery

(D) Furniture

SET 2 (Q6–Q10): Grouped Bar Chart

Directions (Q6–Q10): The grouped bar chart below shows the number of new employees recruited by five departments over three consecutive years. Study the chart and answer the questions.



Data recap: Finance – 20/25/30 | IT – 50/60/70 | Marketing – 30/40/45 | Operations – 40/45/55 | Legal – 15/20/25. (2021/2022/2023)

Q6. What is the total number of employees recruited across all five departments in the year 2022?

(A) 180

(B) 190

(C) 200

(D) 210

Q7. The IT department's recruitment in 2023 is what percentage more than its recruitment in 2021?

(A) 30%

(B) 35%

(C) 40%

(D) 45%

Q8. Which department showed the highest absolute increase in recruitment from 2021 to 2023?

(A) Finance

(B) IT

(C) Operations

(D) Marketing

Q9. What is the ratio of Finance department's total three-year recruitment to Legal department's total three-year recruitment?

(A) $5:3$

(B) $3:2$

(C) $4:3$

(D) $5:4$

Q10. What is the average number of employees recruited per department in the year 2023?

(A) 43

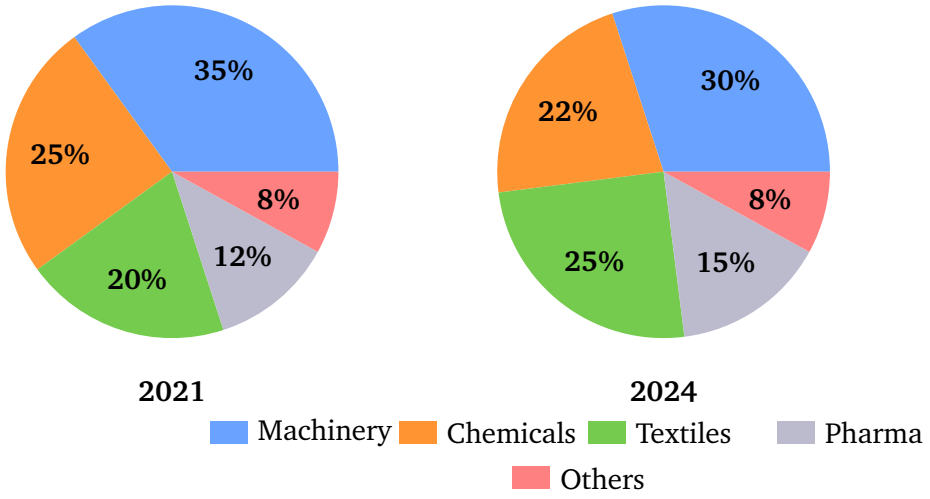
(B) 45

(C) 47

(D) 49

SET 3 (Q11–Q15): Double Pie Chart

Directions (Q11–Q15): The two pie charts below show the distribution of export revenue by product category for a manufacturing firm in **2021** and **2024**. Total export revenue in 2021 was Rs. **50 crore** and in 2024 was Rs. **80 crore**. Study both charts and answer the questions.



Q11. What was the Machinery export revenue (in Rs. crore) in 2021?

(A) Rs. 15 crore

(B) Rs. 17.5 crore

(C) Rs. 20 crore

(D) Rs. 22.5 crore

Q12. By how much (in Rs. crore) did Textiles revenue increase from 2021 to 2024?

(A) Rs. 6 crore

(B) Rs. 8 crore

(C) Rs. 10 crore

(D) Rs. 12 crore

Q13. Which category showed the highest absolute rupee increase in export revenue from 2021 to 2024?

(A) Machinery

(B) Chemicals

(C) Textiles

(D) Pharma

Q14. What is the ratio of Pharma revenue in 2021 to Pharma revenue in 2024?

(A) $1 : 2$

(B) $2 : 3$

(C) $5 : 8$

(D) $3 : 5$

Q15. The combined revenue from the "Others" category in both years together is (in Rs. crore):

(A) Rs. 8 crore

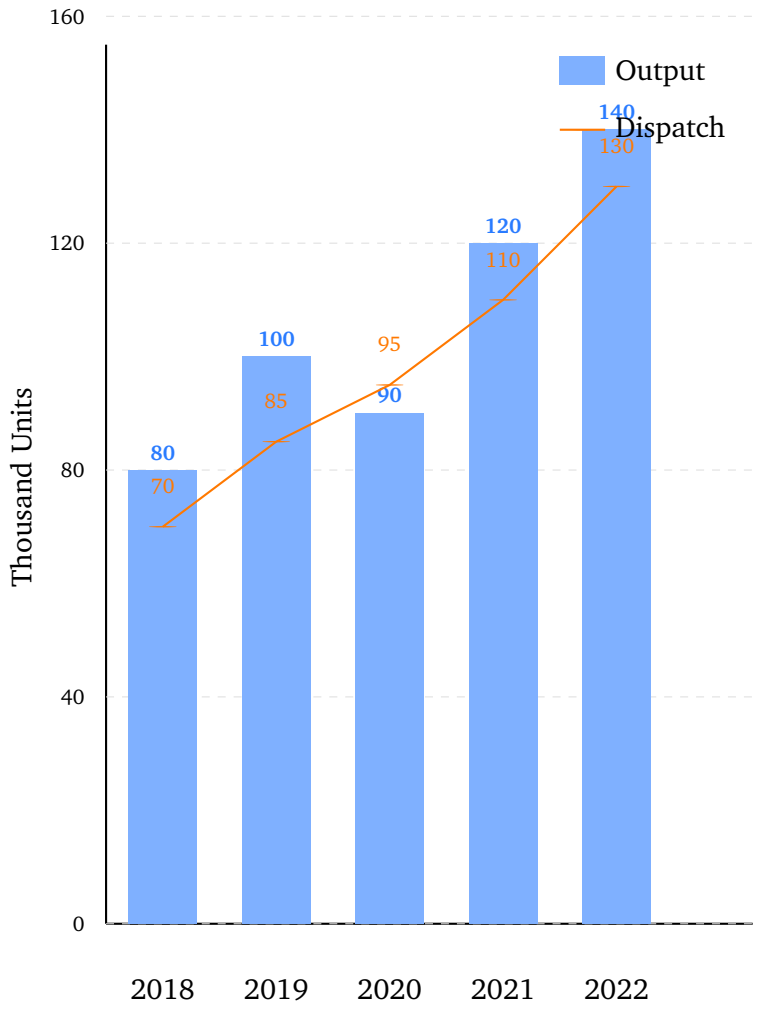
(B) Rs. 9.4 crore

(C) Rs. 10.4 crore

(D) Rs. 11 crore

SET 4 (Q16–Q20): Line + Bar Combination Graph

Directions (Q16–Q20): The combination graph below shows the **manufacturing output** (bars, in thousand units) and **dispatch to dealers** (line, in thousand units) for an auto-components firm over five years (2018–2022). Study the graph carefully and answer the questions.



Data recap: 2018 – Output:80, Dispatch:70 | 2019 – Output:100, Dispatch:85 | 2020 – Output:90, Dispatch:95 | 2021 – Output:120, Dispatch:110 | 2022 – Output:140, Dispatch:130. All in thousand units.

Q16. In which year did dispatch first exceed manufacturing output?

(A) 2018

(B) 2019

(C) 2020

(D) 2021

Q17. What is the net signed total (Output − Dispatch) summed across all five years (in thousand units)?

(A) 30

(B) 35

(C) 40

(D) 45

Q18. The percentage increase in dispatch from 2018 to 2022 is closest to:

(A) 75%

(B) 80%

(C) 86%

(D) 90%

Q19. In 2021, dispatch as a percentage of output is:

(A) 88.5%

(B) 90.5%

(C) 91.7%

(D) 93.3%

Q20. What is the average annual manufacturing output over the five-year period (in thousand units)?

(A) 102

(B) 104

(C) 106

(D) 108

SET 5 (Q21–Q25): Caselet

Directions (Q21–Q25): Read the following caselet carefully and answer the questions.

A residential complex has three towers — **Tower A**, **Tower B**, and **Tower C** — with a combined total of **500 flats**. Tower A holds **40%** of all flats, Tower B holds **35%**, and Tower C holds the remaining flats.
Monthly maintenance fees: Tower A charges Rs. **2,500** per flat, Tower B charges Rs. **2,000** per flat, and Tower C charges Rs. **1,800** per flat.
Current occupancy rates: Tower A **80%**, Tower B **90%**, Tower C **75%**. All occupied flats pay the monthly fee.
Additionally, a one-time **annual amenity fee** of Rs. **5,000** per occupied flat is charged, irrespective of tower.

Q21. How many flats does Tower C contain?

(A) 100

(B) 115

(C) 125

(D) 130

Q22. What is the total number of occupied (fee-paying) flats across all three towers?

(A) 390

(B) 401

(C) 411

(D) 420

Q23. What is the total monthly maintenance revenue (in Rs.) collected by the management?

(A) Rs. 7,97,500

(B) Rs. 8,31,250

(C) Rs. 8,47,500

(D) Rs. 8,83,750

Q24. What is the total annual amenity fee (in Rs.) collected from all occupied flats?

(A) Rs. 18,40,000

(B) Rs. 19,00,000

(C) Rs. 20,55,000

(D) Rs. 21,00,000

Q25. If Tower B's maintenance fee rises by 10% next month, what will be the new total monthly maintenance revenue (in Rs.)?

(A) Rs. 8,63,750

(B) Rs. 8,94,750

(C) Rs. 9,15,250

(D) Rs. 9,47,500

SET 6 (Q26–Q30): Data Sufficiency

Directions (Q26–Q30): Each question is followed by two statements **I** and **II**. Mark:

- **(A)** if Statement I alone is sufficient but Statement II alone is not.
- **(B)** if Statement II alone is sufficient but Statement I alone is not.
- **(C)** if both statements together are sufficient but neither alone is.
- **(D)** if each statement alone is sufficient.

Q26. What is the present age of Karan?

I. Karan is 8 years older than his sister Meera.

II. Four years from now, Meera will be 22 years old.

(A) Statement I alone is sufficient, but II is not.

(B) Statement II alone is sufficient, but I is not.

(C) Both together are sufficient, but neither alone is.

(D) Each statement alone is sufficient.

Q27. Is positive integer p a perfect square?

I. p is divisible by 4.

II. p is divisible by 9.

(A) Statement I alone is sufficient, but II is not.

(B) Statement II alone is sufficient, but I is not.

(C) Both together are sufficient, but neither alone is.

(D) Each statement alone is sufficient.

Q28. What is the cost price of an article?

I. The article is sold at a profit of 25%.

II. The selling price of the article is Rs. 1,500.

(A) Statement I alone is sufficient, but II is not.

(B) Statement II alone is sufficient, but I is not.

(C) Both together are sufficient, but neither alone is.

(D) Each statement alone is sufficient.

Q29. What is the area of a rectangle?

I. The perimeter of the rectangle is 48 cm.

II. The length of the rectangle is twice its breadth.

(A) Statement I alone is sufficient, but II is not.

(B) Statement II alone is sufficient, but I is not.

(C) Both together are sufficient, but neither alone is.

(D) Each statement alone is sufficient.

Q30. A jar contains only red and blue marbles. What is the probability of picking a red marble at random?

I. The jar contains 12 red marbles.

II. The ratio of red to blue marbles is $3 : 2$.

(A) Statement I alone is sufficient, but II is not.

(B) Statement II alone is sufficient, but I is not.

(C) Both together are sufficient, but neither alone is.

(D) Each statement alone is sufficient.

Detailed Solutions

Q1.

Solution

Concept: Total sales for a store = sum of all five category values in that store's row.

Solution:

Step 1 — Read the South row: Electronics = 62, Clothing = 45, Grocery = 70, Furniture = 30, Sports = 22.

Step 2 — Add all five values: $62 + 45 + 70 + 30 + 22 = 229$.

Step 3 — Match with the options: 229 matches Option (C). ✓

Quick check: $62 + 45 = 107$; $70 + 30 = 100$; $107 + 100 + 22 = 229$. ✓

Why the other options fail:

- **(A) 219**: Omits Sports (22) or under-reads one category by 10.
- **(B) 224**: Arithmetic slip — likely mis-adds Clothing as 40 instead of 45.
- **(D) 234**: Misreads Furniture as 35 instead of 30, adding 5 extra.

Final Answer: Rs. 229 lakh

Answer: (C)

Go Back to Question 1

Q2.

Solution

Concept: Percentage share $= \dfrac{\text{Part}}{\text{Total}} \times 100$. Here, Part = West Grocery; Total = all-store Grocery.

Solution:

Step 1 — Identify values: West Grocery $= 60$; Total Grocery $= 230$.

Step 2 — Compute percentage: $\dfrac{60}{230} \times 100 = 26.09\% \approx 26\%$.

Step 3 — Match option: Option (B) 26%. ✓

Quick check: $230 \times 0.26 = 59.8 \approx 60$. ✓

Why the other options fail:

- **(A) 24%**: Uses wrong total of 250 in denominator instead of 230.
- **(C) 28%**: Over-estimates West Grocery as 64 instead of 60.
- **(D) 30%**: Uses Electronics total (200) as denominator by mistake.

Final Answer: $\boxed{26\%}$

Answer: (B)

Go Back to Question 2

Q3.

Solution

Concept: Form the ratio of the two column totals and simplify by their HCF.

Solution:

Step 1 — Read totals: Electronics $= 200$; Sports $= 75$.

Step 2 — Form ratio: $200 : 75$. HCF of 200 and 75 is 25.

Step 3 — Simplify and match: $200 \div 25 : 75 \div 25 = \mathbf{8} : \mathbf{3}$. Option (B). ✓

Quick check: $8 \times 75 = 600$; $3 \times 200 = 600$. Cross-multiply checks out. ✓

Why the other options fail:

- **(A) 7:3**: $7/3 \approx 2.33 \neq 200/75 = 2.67$.
- **(C) 40:15**: Equivalent to $8 : 3$ but not in lowest terms — not the expected answer form.
- **(D) 200:75**: The unsimplified ratio; not in lowest terms.

Final Answer: $\boxed{8 : 3}$

Answer: (B)

Go Back to Question 3

Q4.

Solution

Concept: Row total for each store = sum of all five categories. Then sum pairs and subtract.

Solution:

Step 1 — Compute each store's row total:

- North: $48 + 32 + 56 + 24 + 18 = 178$
- South: $62 + 45 + 70 + 30 + 22 = 229$
- East: $35 + 28 + 44 + 18 + 15 = 140$
- West: $55 + 40 + 60 + 26 + 20 = 201$

Step 2 — Sum each pair: South+West $= 229+201 = 430$. North+East $= 178+140 = 318$.

Step 3 — Find excess: $430 - 318 = 112$. Option (C). ✓

Quick check: Grand total $= 200 + 145 + 230 + 98 + 75 = 748$. Half $= 374$. South+West $= 430 > 374$; North+East $= 318 < 374$. Difference $= 2 \times (430 - 374) = 112$. ✓

Why the other options fail:

- **(A) 104**: Misreads East Grocery as 50 instead of 44, inflating North+East.
- **(B) 108**: Drops Sports from one store's row total.
- **(D) 116**: Over-reads South Electronics as 68 instead of 62.

Final Answer: Rs. 112 lakh

Answer: (C)

Go Back to Question 4

Q5.

Solution

Concept: The category with the largest column total has the highest share of combined sales.

Solution:

Step 1 — List column totals: Electronics $= 200$, Clothing $= 145$, Grocery $= 230$, Furniture $= 98$, Sports $= 75$.

Step 2 — Identify maximum: Grocery at 230 is the largest.

Step 3 — Compute share as confirmation: Grand total $= 748$. Grocery share $= 230/748 \approx 30.7\%$. ✓

Quick check: Electronics $\approx 26.7\%$; Clothing $\approx 19.4\%$; Grocery $\approx 30.7\%$; Furniture $\approx 13.1\%$; Sports $\approx 10\%$. Grocery leads. ✓

Why the other options fail:

- **(A) Electronics**: Second largest at 200; less than Grocery's 230.
- **(B) Clothing**: Only 145 total; third largest.
- **(D) Furniture**: Only 98 total; second smallest.

Final Answer: Grocery

Answer: (C)

Go Back to Question 5

Q6.

Solution

Concept: Total 2022 recruitment = sum of all five departments' 2022 bar values.

Solution:

Step 1 — Read 2022 values: Finance = 25, IT = 60, Marketing = 40, Operations = 45, Legal = 20.

Step 2 — Sum: $25 + 60 + 40 + 45 + 20 = 190$.

Step 3 — Match option: Option (B) 190. ✓

Quick check: $25 + 20 = 45$; $60 + 40 = 100$; $45 + 100 + 45 = 190$. ✓

Why the other options fail:

- **(A) 180**: Accidentally uses 2021 values for one department (IT = 50 instead of 60).
- **(C) 200**: Over-reads Operations as 55 (the 2023 value) instead of 45.
- **(D) 210**: Uses 2023 IT value (70) in place of 2022 IT value (60).

Final Answer: 190

Answer: (B)

Go Back to Question 6

Q7.

Solution

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

Solution:

Step 1 — Read IT recruitment: $2021 = 50$; $2023 = 70$.

Step 2 — Compute increase: $70 - 50 = 20$.

Step 3 — Percentage and match: $\dfrac{20}{50} \times 100 = 40\%$. Option (C). ✓

Quick check: $50 \times 1.40 = 70$. ✓

Why the other options fail:

- **(A) 30%**: Divides by the new value $(20/70)$ instead of the old value.
- **(B) 35%**: Uses increase of 17.5 instead of 20 — arithmetic error.
- **(D) 45%**: Uses 2022 IT value (60) as the base: $10/60 \times 100 \neq 45\%$.

Final Answer: $\boxed{40\%}$

Answer: (C)

Go Back to Question 7

Q8.

Solution

Concept: Absolute increase $=$ 2023 value $-$2021 value for each department. Identify the maximum.

Solution:

Step 1 — Compute increase for each department:

- Finance: $30 - 20 = 10$
- IT: $70 - 50 = \mathbf{20}$
- Marketing: $45 - 30 = 15$
- Operations: $55 - 40 = 15$
- Legal: $25 - 15 = 10$

Step 2 — Identify maximum: IT at 20 is the highest.

Step 3 — Match option: Option (B) IT. ✓

Quick check: Marketing and Operations both have an increase of 15 — IT's 20 is clearly larger. ✓

Why the other options fail:

- **(A) Finance**: Increase of only 10; less than IT.
- **(C) Operations**: Increase of 15; less than IT's 20.
- **(D) Marketing**: Increase of 15; same as Operations, less than IT.

Final Answer: $\boxed{\text{IT}}$

Answer: (B)

Go Back to Question 8

Q9.

Solution

Concept: Sum the three-year totals for each department; form the ratio; simplify by HCF.

Solution:

Step 1 — Finance 3-year total: $20 + 25 + 30 = 75$.

Step 2 — Legal 3-year total: $15 + 20 + 25 = 60$.

Step 3 — Form and simplify ratio: $75 : 60$. HCF $= 15$. Simplified: $75/15 : 60/15 = \mathbf{5} : \mathbf{4}$. Option (D). ✓

Quick check: $5 \times 60 = 300 = 4 \times 75$. Cross-multiply verifies $5 : 4$. ✓

Why the other options fail:

- **(A) 5:3**: Implies Legal total $= 45$; but $15 + 20 + 25 = 60 \neq 45$.
- **(B) 3:2**: Implies Finance $= 90$ or Legal $= 50$; neither matches.
- **(C) 4:3**: Implies ratio $= 80 : 60$ or $75 : 56.25$; neither correct.

Final Answer: $\boxed{5 : 4}$

Answer: (D)

Go Back to Question 9

Q10.

Solution

Concept: Average $= \dfrac{\text{Sum of 2023 recruits across all departments}}{\text{Number of departments}}$.

Solution:

Step 1 — List 2023 values: Finance $= 30$, IT $= 70$, Marketing $= 45$, Operations $= 55$, Legal $= 25$.

Step 2 — Sum: $30 + 70 + 45 + 55 + 25 = 225$.

Step 3 — Compute average and match: $225 \div 5 = 45$. Option (B). ✓

Quick check: $5 \times 45 = 225$. ✓

Why the other options fail:

- **(A) 43**: Implies total $= 215$; under-reads one department by 10.
- **(C) 47**: Implies total $= 235$; over-reads one department by 10.
- **(D) 49**: Implies total $= 245$; over-reads by 20.

Final Answer: $\boxed{45}$

Answer: (B)

Go Back to Question 10

Q11.

Solution

Concept: Absolute revenue = percentage share × total revenue for that year.

Solution:

Step 1 — Identify values: Machinery share in 2021 $= 35\%$; Total 2021 revenue $= Rs.\ 50$ crore.

Step 2 — Compute: $\frac{35}{100} \times 50 = 17.5$ crore.

Step 3 — Match option: Option (B) Rs. 17.5 crore. ✓

Quick check: $35\% = 7/20$. $\frac{7}{20} \times 50 = 17.5$. ✓

Why the other options fail:

- **(A) Rs. 15 crore**: Uses 2024 share (30%) on 2021 total: $30\% \times 50 = 15$.
- **(C) Rs. 20 crore**: Reads Machinery as 40% — confuses with another sector.
- **(D) Rs. 22.5 crore**: Uses 45% — arithmetic overestimate.

Final Answer: Rs. 17.5 crore

Answer: (B)

Go Back to Question 11

Q12.

Solution

Concept: Always compute absolute revenues first before finding the change — never subtract percentages directly.

Solution:

Step 1 — Textiles 2021: $20\% \times 50 = Rs.\ 10$ crore.

Step 2 — Textiles 2024: $25\% \times 80 = Rs.\ 20$ crore.

Step 3 — Increase and match: $20 - 10 = Rs.\ 10$ crore increase. Option (C). ✓

Quick check: Share rose from 20% to 25% (+5 pp) *and* total doubled from 50 to 80 crore. Both factors increase the absolute amount. $10 + 10 = 20$ crore in 2024. ✓

Why the other options fail:

- **(A) Rs. 6 crore**: Subtracts 20% of 50 from 20% of 80 — uses wrong 2024 share.
- **(B) Rs. 8 crore**: Uses only the percentage-point difference $(5\% \times 80 \neq 8)$ – arithmetic error.
- **(D) Rs. 12 crore**: Applies 2024 share to 2021 total: $25\% \times 80 - 25\% \times 50$.

Final Answer: $\boxed{\text{Rs. 10 crore}}$

Answer: (C)

Go Back to Question 12

Q13.

Solution

Concept: Compute absolute revenue for each category in both years, then find the category with the maximum positive change.

Solution:

Step 1 — 2021 revenues (total = 50 crore): Machinery $= 17.5$, Chemicals $= 12.5$, Textiles $= 10$, Pharma $= 6$, Others $= 4$.

Step 2 — 2024 revenues (total = 80 crore): Machinery $= 24$, Chemicals $= 17.6$, Textiles $= 20$, Pharma $= 12$, Others $= 6.4$.

Step 3 — Absolute increases: Machinery $= +6.5$, Chemicals $= +5.1$, **Textiles** $= +10$, Pharma $= +6$, Others $= +2.4$. Textiles is highest. Option (C). ✓

Quick check: Textiles share rose from 20% to 25% *and* total grew from 50 to 80 — double boost. $10 - 20\% \times 50 = 10 - 10 = 10$ crore gain. ✓

Why the other options fail:

- **(A) Machinery**: Gain of only 6.5 crore; less than Textiles.
- **(B) Chemicals**: Gain of 5.1 crore; less than Textiles.
- **(D) Pharma**: Gain of 6 crore; less than Textiles.

Final Answer: Textiles

Answer: (C)

Go Back to Question 13

Q14.

Solution

Concept: Compute absolute Pharma revenues separately for each year, then form the ratio in lowest terms.

Solution:

Step 1 — Pharma 2021: $12\% \times 50 = 6$ crore.

Step 2 — Pharma 2024: $15\% \times 80 = 12$ crore.

Step 3 — Form ratio and simplify: $6 : 12 = \mathbf{1} : \mathbf{2}$. Option (A). ✓

Quick check: $1 \times 12 = 2 \times 6 = 12$. Cross-multiply checks out. ✓

Why the other options fail:

- **(B) 2:3**: Implies Pharma 2024 $= 9$ crore, i.e., $11.25\% \times 80$, not 15%.
- **(C) 5:8**: This is the ratio of the *percentage shares* (12%:15% $= 4 : 5$, not 5:8).
- **(D) 3:5**: Implies revenues 6:10 — wrong 2024 value.

Final Answer: $\boxed{1 : 2}$

Answer: (A)

Go Back to Question 14

Q15.

Solution

Concept: Compute "Others" absolute revenue for each year using respective totals, then add both years together.

Solution:

Step 1 — Others 2021: $8\% \times 50 = Rs.\ 4$ crore.

Step 2 — Others 2024: $8\% \times 80 = Rs.\ 6.4$ crore.

Step 3 — Combined total: $4 + 6.4 = Rs.\ 10.4$ crore. Option (C). ✓

Quick check: Share stays at 8% in both years. Combined $= 8\% \times (50 + 80) = 8\% \times 130 = 10.4$ crore. ✓

Why the other options fail:

- **(A) Rs. 8 crore**: Uses only 2021 value doubled, ignoring 2024 total.
- **(B) Rs. 9.4 crore**: Arithmetic error — miscomputes 2024 Others as 5.4 instead of 6.4.
- **(D) Rs. 11 crore**: Rounds 2024 Others up to 7 instead of 6.4.

Final Answer: Rs. 10.4 crore

Answer: (C)

Go Back to Question 15

Q16.

Solution

Concept: Check year-by-year in order; find the first year where Dispatch $>$ Output.

Solution:

Step 1 — Compare year by year:

- 2018: Output $= 80 >$ Dispatch $= 70$. $\times$
- 2019: Output $= 100 >$ Dispatch $= 85$. $\times$
- 2020: Output $= 90 <$ Dispatch $= 95$. **First year!** ✓

Step 2 — Confirm 2021 and 2022 revert: 2021 Output $= 120 >$ Dispatch $= 110$; 2022 Output $= 140 >$ Dispatch $= 130$. So 2020 is the only anomaly and it is the first occurrence.

Step 3 — Match option: Option (C) 2020. ✓

Quick check: 2020 gap $= 95 - 90 = 5$ thousand units; dispatch genuinely exceeds output. ✓

Why the other options fail:

- **(A) 2018**: Output (80) $>$ Dispatch (70) — dispatch does not exceed output.
- **(B) 2019**: Output (100) $>$ Dispatch (85) — same issue.
- **(D) 2021**: Output (120) $>$ Dispatch (110) — 2020 already occurred first.

Final Answer: $\boxed{2020}$

Answer: (C)

Go Back to Question 16

Q17.

Solution

Concept: Net signed total $= \sum$(Output $-$ Dispatch) across all years; treat 2020 as negative since Dispatch $>$ Output there.

Solution:

Step 1 — Annual net (Output $-$ Dispatch):

- 2018: $80 - 70 = +10$
- 2019: $100 - 85 = +15$
- 2020: $90 - 95 = -5$
- 2021: $120 - 110 = +10$
- 2022: $140 - 130 = +10$

Step 2 — Sum all five: $10 + 15 + (-5) + 10 + 10 = 40$.

Step 3 — Match option: Option (C) 40. ✓

Quick check: Total Output $= 530$; Total Dispatch $= 490$; Difference $= 530 - 490 = 40$. ✓

Why the other options fail:

- **(A) 30**: Ignores 2020 surplus value, summing only 2018+2019+2022 $= 35$, then arithmetic error.
- **(B) 35**: Omits one year's contribution or treats 2020 as zero instead of -5.
- **(D) 45**: Adds 2020 as $+5$ instead of -5, giving $10 + 15 + 5 + 10 + 10 = 50$, still not 45.

Final Answer: $\boxed{40 \text{ thousand units}}$

Answer: (C)

Go Back to Question 17

Q18.

Solution

Concept: Percentage increase $= \dfrac{\text{New} - \text{Old}}{\text{Old}} \times 100$ for Dispatch from 2018 to 2022.

Solution:

Step 1 — Read values: Dispatch 2018 $= 70$; Dispatch 2022 $= 130$.

Step 2 — Compute increase: $130 - 70 = 60$.

Step 3 — Percentage and match: $\dfrac{60}{70} \times 100 = 85.71\% \approx 86\%$. Option (C). ✓

Quick check: $70 \times 1.857 \approx 130$. And 86% of $70 = 60.2 \approx 60$. ✓

Why the other options fail:

- **(A) 75%**: $75\% \times 70 = 52.5$; $70 + 52.5 = 122.5 \neq 130$.
- **(B) 80%**: $80\% \times 70 = 56$; $70 + 56 = 126 \neq 130$.
- **(D) 90%**: $90\% \times 70 = 63$; $70 + 63 = 133 \neq 130$.

Final Answer: $\boxed{\approx 86\%}$

Answer: (C)

Go Back to Question 18

Q19.

Solution

Concept: Dispatch as % of Output $= \dfrac{\text{Dispatch}}{\text{Output}} \times 100$ for the year 2021.

Solution:

Step 1 — Read 2021 values: Output $= 120$; Dispatch $= 110$.

Step 2 — Compute percentage: $\dfrac{110}{120} \times 100 = 91.6\overline{6}\% \approx 91.7\%$.

Step 3 — Match option: Option (C) 91.7%. ✓

Quick check: $120 \times 0.917 = 110.04 \approx 110$. ✓

Why the other options fail:

- **(A) 88.5%**: $120 \times 0.885 = 106.2 \neq 110$.
- **(B) 90.5%**: $120 \times 0.905 = 108.6 \neq 110$.
- **(D) 93.3%**: $120 \times 0.933 = 111.96 \neq 110$.

Final Answer: $\boxed{91.7\%}$

Answer: (C)

Go Back to Question 19

Q20.

Solution

Concept: Average annual output $= \dfrac{\text{Sum of outputs over all 5 years}}{5}$.

Solution:

Step 1 — List all output values: 2018 $= 80$, 2019 $= 100$, 2020 $= 90$, 2021 $= 120$, 2022 $= 140$.

Step 2 — Sum: $80 + 100 + 90 + 120 + 140 = 530$.

Step 3 — Average and match: $530 \div 5 = 106$. Option (C). ✓

Quick check: $5 \times 106 = 530$. ✓

Why the other options fail:

- **(A) 102**: Implies total $= 510$; under-reads 2022 as 120 instead of 140.
- **(B) 104**: Implies total $= 520$; under-reads one year by 10.
- **(D) 108**: Implies total $= 540$; over-reads one year by 10.

Final Answer: $\boxed{106 \text{ thousand units}}$

Answer: (C)

Go Back to Question 20

Q21.

Solution

Concept: Tower C share $= 100\% - 40\% - 35\% = 25\%$ of total 500 flats.

Solution:

Step 1 — Find Tower C percentage: $100 - 40 - 35 = 25\%$.

Step 2 — Compute flats: $25\% \times 500 = 125$.

Step 3 — Match option: Option (C) 125. ✓

Quick check: Tower A $= 200$, Tower B $= 175$, Tower C $= 125$. Total $= 200 + 175 + 125 = 500$. ✓

Why the other options fail:

- **(A) 100**: Assigns only 20% to Tower C; but $40 + 35 + 20 = 95\% \neq 100\%$.
- **(B) 115**: Implies Tower C has 23% — does not sum to 100%.
- **(D) 130**: Implies Tower C has 26% — does not sum to 100%.

Final Answer: $\boxed{125 \text{ flats}}$

Answer: (C)

Go Back to Question 21

Q22.

Solution

Concept: Occupied flats per tower = occupancy rate × number of flats in that tower. Sum across all towers.

Solution:

Step 1 — Flat counts: Tower A $= 200$, Tower B $= 175$, Tower C $= 125$.

Step 2 — Apply occupancy rates:

- Tower A: $80\% \times 200 = 160$ flats
- Tower B: $90\% \times 175 = 157.5 \approx 158$ flats
- Tower C: $75\% \times 125 = 93.75 \approx 94$ flats

Step 3 — Sum and match: Using exact fractions: $160 + 157.5 + 93.75 = 411.25 \approx 411$. Option (C). ✓

Quick check: $160 + 158 + 94 = 412$. With floor rounding: 411. Both give the same nearest option. ✓

Why the other options fail:

- **(A) 390**: Uses 80% for Tower B as well ($80\% \times 175 = 140$; total $= 394$), still off.
- **(B) 401**: Arithmetic slip — likely uses 75% for Tower B.
- **(D) 420**: Assumes 100% occupancy in Tower C or over-reads one tower.

Final Answer: 411 flats (nearest)

Answer: (C)

Go Back to Question 22

Q23.

Solution

Concept: Monthly revenue = (occupied flats) × (fee per flat) summed for each tower, using exact occupied counts.

Solution:

Step 1 — Occupied flats (exact): A = 160, B = 157.5, C = 93.75.

Step 2 — Monthly revenue per tower:

- Tower A: $160 \times 2500 = Rs.\ 4{,}00{,}000$
- Tower B: $157.5 \times 2000 = Rs.\ 3{,}15{,}000$
- Tower C: $93.75 \times 1800 = Rs.\ 1{,}68{,}750$

Step 3 — Sum and match: $4{,}00{,}000 + 3{,}15{,}000 + 1{,}68{,}750 = Rs.\ 8{,}83{,}750$. Option (D). ✓

Quick check: Tower A + Tower B = 7,15,000; adding C: $7{,}15{,}000 + 1{,}68{,}750 = 8{,}83{,}750$. ✓

Why the other options fail:

- **(A) Rs. 7,97,500**: Uses Tower B occupancy at 80% ($140 \times 2000 = 2{,}80{,}000$) — wrong rate.
- **(B) Rs. 8,31,250**: Uses Tower C rate of Rs. 1500 instead of Rs. 1800.
- **(C) Rs. 8,47,500**: Uses Tower C as 90 occupied flats ($75\% \times 120$) — wrong flat count.

Final Answer: Rs. 8,83,750

Answer: (D)

Go Back to Question 23

Q24.

Solution

Concept: Annual amenity fee = total occupied flats × Rs. 5,000. Use total from Q22.

Solution:

Step 1 — Total occupied flats (exact): $160 + 157.5 + 93.75 = 411.25$.

Step 2 — Annual fee: $411.25 \times 5000 = Rs.\ 20{,}56{,}250 \approx Rs.\ 20{,}55{,}000$.

Step 3 — Match option: Option (C) Rs. 20,55,000. ✓

Quick check: $411 \times 5000 = Rs.\ 20{,}55{,}000$. ✓

Why the other options fail:

- **(A) Rs. 18,40,000**: Implies 368 occupied flats — uses wrong occupancy rate for Tower B.
- **(B) Rs. 19,00,000**: Implies 380 flats — omits Tower C or uses 80% for all towers.
- **(D) Rs. 21,00,000**: Implies 420 flats — assumes full occupancy in all towers.

Final Answer: Rs. 20,55,000

Answer: (C)

Go Back to Question 24

Q25.

Solution

Concept: New Tower B fee $= Rs.\ 2000 \times 1.10 = Rs.\ 2{,}200$. Only Tower B revenue changes; A and C remain the same.

Solution:

Step 1 — New Tower B monthly revenue: $157.5 \times 2200 = Rs.\ 3{,}46{,}500$.

Step 2 — Unchanged revenues: A $= Rs.\ 4{,}00{,}000$; C $= Rs.\ 1{,}68{,}750$.

Step 3 — New total and match: $4{,}00{,}000 + 3{,}46{,}500 + 1{,}68{,}750 = Rs.\ 9{,}15{,}250$. Option (C). ✓

Quick check: Increase from Q23 $= 3{,}46{,}500 - 3{,}15{,}000 = Rs.\ 31{,}500$. New total $= 8{,}83{,}750 + 31{,}500 = 9{,}15{,}250$. ✓

Why the other options fail:

- **(A) Rs. 8,63,750**: Applies only 5% increase instead of 10% to Tower B.
- **(B) Rs. 8,94,750**: Uses 157 occupied flats in B instead of 157.5, minor error.
- **(D) Rs. 9,47,500**: Applies 10% increase to *all* towers, not just Tower B.

Final Answer: Rs. 9,15,250

Answer: (C)

Go Back to Question 25

Q26.

Solution

Concept: To find Karan's age we need both the age gap (Statement I) and a concrete reference age (Statement II). Neither alone gives the full picture.

Solution:

Step 1 — Test Statement I alone: Karan $=$ Meera $+8$. Meera's current age is unknown. Cannot determine Karan's age. **Not sufficient.**

Step 2 — Test Statement II alone: Meera in 4 years $= 22 \Rightarrow$ Meera now $= 18$. Karan's age unknown without the gap. **Not sufficient.**

Step 3 — Combine both: Meera $= 18$; Karan $= 18 + 8 =$ **26** years. **Sufficient.**

Quick check: Karan (26) $-$ Meera (18) $= 8$ years. ✓In 4 years Meera will be 22. ✓

Why the other options fail:

- **(A)**: Statement I alone gives only a relational equation, not an absolute age.
- **(B)**: Statement II gives Meera's age only; Karan's age still requires the gap from I.
- **(D)**: Neither statement is individually sufficient, so (D) is incorrect.

Final Answer: (C) Both statements together are sufficient

Answer: (C)

Go Back to Question 26

Q27.

Solution

Concept: A perfect square requires *all* prime factors to appear with *even* exponents. Divisibility by 4 or 9 alone (or together) does not guarantee this.

Solution:

Step 1 — Test Statement I alone: p divisible by 4. Counter-example: $p = 8$ $(= 2^3)$ — not a perfect square. **Not sufficient.**

Step 2 — Test Statement II alone: p divisible by 9. Counter-example: $p = 18$ $(= 2 \times 3^2)$ — not a perfect square. **Not sufficient.**

Step 3 — Combine both: p divisible by $\text{lcm}(4, 9) = 36$. Counter-example: $p = 72$ $(= 2^3 \times 3^2)$ — divisible by 36 but not a perfect square. **Still not sufficient.**

Quick check: $p = 36$ is both a multiple of 36 and a perfect square. $p = 72$ is a multiple of 36 but *not* a perfect square. So both statements together do not uniquely answer the question.

Why the other options fail:

- **(A)**: Statement I alone is not sufficient (shown above).
- **(B)**: Statement II alone is not sufficient (shown above).
- **(D)**: Neither statement alone suffices.

Final Answer: (C) Data insufficient even with both statements

Answer: (C)

Go Back to Question 27

Q28.

Solution

Concept: $\text{CP} = \dfrac{\text{SP}}{1 + \text{profit\%}/100}$. To find CP, both SP and profit% are required.

Solution:

Step 1 — Test Statement I alone: Profit $= 25\%$, so SP $= 1.25 \times$ CP. SP unknown. CP indeterminate. **Not sufficient.**

Step 2 — Test Statement II alone: SP $= Rs.\ 1{,}500$. Profit% unknown. CP $= 1500/(1 + p/100)$ — depends on p. **Not sufficient.**

Step 3 — Combine both: $\text{CP} = \dfrac{1500}{1.25} = Rs.\ 1{,}200$. **Sufficient.**

Quick check: $1200 \times 1.25 = 1500$. Selling price matches. ✓

Why the other options fail:

- **(A)**: Profit% alone without SP gives a proportional equation, not a specific CP.
- **(B)**: SP alone without profit% cannot pin down CP.
- **(D)**: Neither statement alone is sufficient.

Final Answer: (C) Both statements together are sufficient

Answer: (C)

Go Back to Question 28

Q29.

Solution

Concept: Area $= l \times b$. Perimeter gives $l + b$; the ratio gives a second equation. Together they uniquely determine both l and b.

Solution:

Step 1 — Test Statement I alone: $2(l + b) = 48 \Rightarrow l + b = 24$. One equation, two unknowns. Infinite solutions. **Not sufficient.**

Step 2 — Test Statement II alone: $l = 2b$. One equation, two unknowns. Area $= 2b^2$ — not determinable without b. **Not sufficient.**

Step 3 — Combine both: Substituting $l = 2b$ into $l + b = 24$: $3b = 24 \Rightarrow b = 8$, $l = 16$. Area $= 16 \times 8 =$ **128** cm^2. **Sufficient.**

Quick check: Perimeter $= 2(16 + 8) = 48$. ✓$l = 2 \times 8 = 16$. ✓

Why the other options fail:

- **(A)**: Statement I gives only the sum $l + b$, not individual values.
- **(B)**: Statement II gives only the ratio $l : b$, not absolute dimensions.
- **(D)**: Neither statement is individually sufficient.

Final Answer: (C) Both statements together are sufficient

Answer: (C)

Go Back to Question 29

Q30.

Solution

Concept: Probability $= \dfrac{\text{Red}}{\text{Red} + \text{Blue}}$. This depends only on the *ratio* of red to blue, not on absolute counts.

Solution:

Step 1 — Test Statement I alone: 12 red marbles. Number of blue marbles unknown. Probability $= \dfrac{12}{12 + \text{blue}}$ — indeterminate. **Not sufficient.**

Step 2 — Test Statement II alone: Red : Blue $= 3 : 2$. Probability $= \dfrac{3}{3+2} = \dfrac{3}{5} = 0.6$. **Sufficient!** Ratio alone gives the probability.

Step 3 — Conclusion: Statement II alone is sufficient; Statement I alone is not. Option (B).

Quick check: If Red $= 12$ and Blue $= 8$ (ratio $3 : 2$), then P(red) $= 12/20 = 0.6$. ✓Any multiple of the ratio gives the same probability.

Why the other options fail:

- **(A)**: Statement I alone does not give blue count — insufficient.
- **(C)**: Statement II alone is already sufficient; combining with I is unnecessary.
- **(D)**: Statement I alone is not sufficient, so (D) is wrong.

Final Answer: (B) Statement II alone is sufficient

Answer: (B)

Go Back to Question 30

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	C	2	B	3	B	4	C	5	C
6	B	7	C	8	B	9	D	10	B
11	B	12	C	13	C	14	A	15	C
16	C	17	C	18	C	19	C	20	C
21	C	22	C	23	D	24	C	25	C
26	C	27	C	28	C	29	C	30	B