NMAT Quantitative Skills

Sample Paper – 3

Duration: 52 Minutes **Maximum Marks: 108**

Instructions

- This paper contains **36** Multiple Choice Questions (Single Correct Answer), modelled on the Quantitative Skills section of **NMAT** by GMAC.
- Each correct answer carries **+3 marks**. There is **no negative marking** for incorrect or unattempted answers, so attempt every question.
- Only **one** option is correct. Choose the most appropriate answer.
- NMAT is a computer-based test with sectional time limits; attempt this practice paper in one timed sitting of about **52 minutes**.
- Use of mobile phones, dictionaries or electronic gadgets is prohibited; a basic on-screen calculator is allowed in NMAT, but practise mental methods.

Part A: Arithmetic

Q1. A shirt is marked at Rs. 800. During a sale it is offered at a discount of 20%. What is the price a customer pays after the discount?

(A) Rs. 600

(B) Rs. 620

(C) Rs. 640

(D) Rs. 680

Q2. A trader sells a wristwatch for Rs. 1080 and in doing so suffers a loss of 10%. What was the cost price of the watch?

(A) Rs. 1100

(B) Rs. 1200

(C) Rs. 1150

(D) Rs. 1300

Q3. A sum of Rs. 4200 is divided between X and Y in the ratio $3 : 4$. Find Y's share.

(A) Rs. 1800

(B) Rs. 2000

(C) Rs. 2100

(D) Rs. 2400

Q4. The average of 4 numbers is 21. When a fifth number is added, the average of all 5 numbers becomes 23. What is the fifth number?

(A) 31

(B) 29

(C) 25

(D) 33

Q5. A train travels a distance of 360 km in 5 hours. Find the average speed of the train in km/h.

(A) 60

(B) 68

(C) 72

(D) 75

Q6. P can complete a task in 12 days and Q can complete the same task in 24 days. Working together, in how many days will they finish the task?

(A) 6

(B) 16

(C) 8

(D) 36

Q7. Find the simple interest on Rs. 6000 at the rate of 5% per annum for 4 years.

(A) Rs. 1200

(B) Rs. 1500

(C) Rs. 1000

(D) Rs. 1320

Q8. Find the compound interest on Rs. 5000 at 20% per annum, compounded annually, for 2 years.

(A) Rs. 2000

(B) Rs. 2100

(C) Rs. 2400

(D) Rs. 2200

Q9. In what ratio must milk costing Rs. 20 per litre be mixed with milk costing Rs. 30 per litre so that the mixture is worth Rs. 24 per litre?

(A) $2:3$

(B) $4:3$

(C) $3:2$

(D) $1:1$

Q10. A invests Rs. 5000 and B invests Rs. 7000 in a business for the same period. If the total annual profit is Rs. 3600, find A's share of the profit.

(A) Rs. 2100

(B) Rs. 1800

(C) Rs. 1200

(D) Rs. 1500

Part B: Algebra and Number System

Q11. Solve for x: $5x - 3 = 17$.

(A) 3

(B) 4

(C) 5

(D) 2

Q12. The equation $x^2 - 9x + 20 = 0$ has two real roots. What is the larger of the two roots?

(A) 2

(B) 3

(C) 4

(D) 5

Q13. Simplify: $3^2 \times 3^3$.

(A) 81

(B) 243

(C) 729

(D) 27

Q14. Find the highest common factor (HCF) of 24 and 36.

(A) 12

(B) 6

(C) 72

(D) 18

Q15. Find the 8th term of the arithmetic progression $5,\ 9,\ 13,\ \ldots$

(A) 29

(B) 37

(C) 33

(D) 41

Q16. Simplify using the order of operations: $20 - 6 \div 2 + 4 \times 3$.

(A) 25

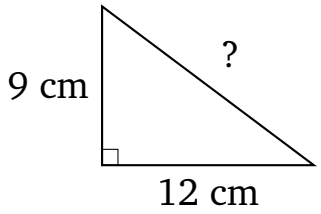
(B) 27

(C) 29

(D) 31

Part C: Geometry and Mensuration

Q17. In the right-angled triangle shown, the two legs measure 9 cm and 12 cm. Find the length of the hypotenuse.



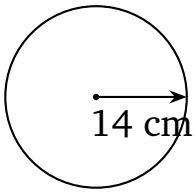
(A) 11 cm

(B) 21 cm

(C) 13 cm

(D) 15 cm

Q18. The circle shown has radius 14 cm. Find its circumference. (Take $\pi = \frac{22}{7}$.)



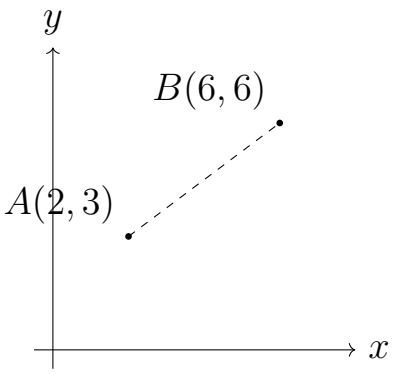
(A) 154 cm

(B) 44 cm

(C) 88 cm

(D) 616 cm

Q19. Find the distance between the points $A(2, 3)$ and $B(6, 6)$ shown on the coordinate plane.



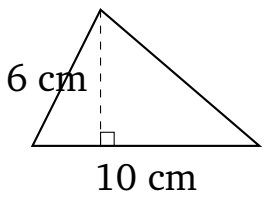
(A) 4

(B) 5

(C) 7

(D) 6

Q20. The triangle shown has base 10 cm and height 6 cm. Find its area.



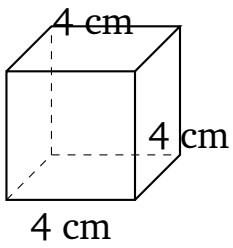
(A) 60 cm^2

(B) 30 cm^2

(C) 16 cm^2

(D) 45 cm^2

Q21. The cube shown has each edge equal to 4 cm. Find its volume.



(A) 64 cm^3

(B) 16 cm^3

(C) 48 cm^3

(D) 96 cm^3

Part D: Modern Maths

Q22. A bag contains 3 red balls and 5 blue balls, as shown. If one ball is drawn at random, what is the probability that it is red?

(A) $\frac{5}{8}$

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

(C) $\frac{3}{8}$

(D) $\frac{1}{4}$

Q23. In how many ways can a team of 3 members be chosen from a group of 5 people?

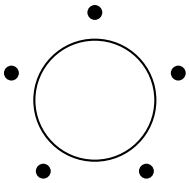
(A) 10

(B) 20

(C) 60

(D) 15

Q24. In how many ways can 5 friends be seated around a circular table, as shown? (Two arrangements are the same if one is a rotation of the other.)



(A) 120

(B) 60

(C) 12

(D) 24

Part E: Data Interpretation

Data Set I (Q25–Q28): The table below shows the number of units (in thousands) produced by four factories W, X, Y and Z in the years 2021, 2022 and 2023.

Factory	2021	2022	2023
W	40	55	65
X	60	50	70
Y	30	45	60
Z	50	60	55

Q25. What is the total number of units (in thousands) produced by all four factories together in the year 2023?

(A) 210

(B) 230

(C) 240

(D) 250

Q26. Which factory recorded the largest increase in units produced from 2021 to 2023?

(A) W

(B) Y

(C) X

(D) Z

Q27. What is the percentage increase in the units produced by factory Y from 2021 to 2023?

(A) 100%

(B) 50%

(C) 75%

(D) 40%

Q28. What is the ratio of factory W's production in 2021 to factory X's production in 2023?

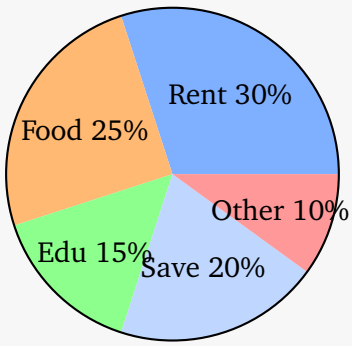
(A) $4 : 7$

(B) $7 : 4$

(C) $4 : 5$

(D) $5 : 7$

Data Set II (Q29–Q32): The pie chart below shows how a family's total monthly income of Rs. 40000 is split across five heads.



Q29. What amount does the family spend on Food each month?

(A) Rs. 12000

(B) Rs. 10000

(C) Rs. 8000

(D) Rs. 6000

Q30. What amount does the family save each month?

(A) Rs. 8000

(B) Rs. 6000

(C) Rs. 10000

(D) Rs. 4000

Q31. By how many rupees does the monthly spending on Rent exceed the monthly spending on Education?

(A) Rs. 4000

(B) Rs. 12000

(C) Rs. 4500

(D) Rs. 6000

Q32. What is the central angle of the sector representing Savings in the pie chart?

(A) 90°

(B) 72°

(C) 108°

(D) 36°

Part F: Data Sufficiency

Directions (Q33–Q36): Each question below is followed by two statements, I and II. Decide whether the information in the statements is sufficient to answer the question and choose from the standard options given with each question.

Q33. What is the value of x?

I. $x + y = 10$.

II. $x - y = 4$.

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

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

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

(D) Each statement alone is sufficient.

Q34. What is the area of a rectangle?

I. The length is 8 cm and the breadth is 5 cm.

II. The perimeter of the rectangle is 26 cm.

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

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

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

(D) Each statement alone is sufficient.

Q35. Is the positive integer n divisible by 6?

I. n is divisible by 3.

II. n is divisible by 12.

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

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

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

(D) Each statement alone is sufficient.

Q36. What is the perimeter of a square?

I. The side of the square is 7 cm.

II. The area of the square is 49 cm^2.

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

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

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

(D) Each statement alone is sufficient.

Detailed Solutions

Q1.

Solution

Concept — Discount: The selling price after a discount is the marked price minus the discount, where the discount is that percentage of the marked price.

Step 1: Marked price $=$ Rs. 800, discount $= 20\%$.

Step 2: Discount amount $= \dfrac{20}{100} \times 800$.

Step 3: Discount amount $= 20 \times 8 = 160$.

Step 4: Price paid $= 800 - 160 = 640$.

Why other options are wrong:

- Option A (600): uses a discount of Rs. 200, i.e. 25%.
- Option B (620): uses a wrong discount of Rs. 180.
- Option D (680): uses only a 15% discount ($= 120$).

Final Answer: Rs. 640 $\Rightarrow$ C

Answer: (C) Go Back to Q1

Q2.

Solution

Concept — Loss: Selling price $=$ Cost price $\times(1 -$ Loss%$)$, so Cost price $= \dfrac{\text{Selling price}}{1 - \text{Loss\%}}$.

Step 1: Selling price $=$ Rs. 1080, Loss $= 10\%$.

Step 2: Selling price is $100\% - 10\% = 90\%$ of the cost price.

Step 3: So 90% of Cost price $= 1080$.

Step 4: Cost price $= \dfrac{1080}{90} \times 100$.

Step 5: $\dfrac{1080}{90} = 12$, so Cost price $= 12 \times 100 = 1200$.

Why other options are wrong:

- Option A (1100): does not satisfy a 10% loss.
- Option C (1150): a 10% loss on it gives Rs. 1035, not 1080.

- Option D (1300): a 10% loss on it gives Rs. 1170, not 1080.

Final Answer: Rs. 1200 $\Rightarrow$ B

Answer: (B) Go Back to Q2

Q3.

Solution

Concept — Ratio and Proportion: A share equals its ratio part divided by the sum of parts, times the total amount.

Step 1: Ratio $X : Y = 3 : 4$, so total parts $= 3 + 4 = 7$.

Step 2: Y's part $= 4$ out of 7.

Step 3: Y's share $= \frac{4}{7} \times 4200$.

Step 4: $\frac{4200}{7} = 600$.

Step 5: Y's share $= 4 \times 600 = 2400$.

Why other options are wrong:

- Option A (1800): this is X's share, not Y's.
- Option B (2000): ignores the exact ratio parts.
- Option C (2100): this is an equal half-split, ignoring the ratio.

Final Answer: Rs. 2400 $\Rightarrow$ D

Answer: (D) Go Back to Q3

Q4.

Solution

Concept — Averages: Sum $=$ Average $\times$ Count. The new number is the new sum minus the old sum.

Step 1: Sum of 4 numbers $= 21 \times 4 = 84$.

Step 2: Sum of 5 numbers $= 23 \times 5 = 115$.

Step 3: Fifth number $= 115 - 84$.

Step 4: Fifth number $= 31$.

Why other options are wrong:

- Option B (29): uses a wrong new sum.
- Option C (25): equals the average shift times count, not the number.
- Option D (33): an arithmetic slip on the subtraction.

Final Answer: 31 $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q4

Q5.

Solution

Concept — Speed, Time and Distance: Speed $= \dfrac{\text{Distance}}{\text{Time}}$.

Step 1: Distance $= 360$ km, Time $= 5$ hours.

Step 2: Speed $= \dfrac{360}{5}$.

Step 3: Speed $= 72$ km/h.

Why other options are wrong:

- Option A (60): would cover only $60 \times 5 = 300$ km.
- Option B (68): would cover only 340 km.
- Option D (75): would cover 375 km, too far.

Final Answer: 72 km/h $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q5

Q6.

Solution

Concept — Time and Work: Add the one-day work of each worker to get the combined one-day work, then take the reciprocal.

Step 1: P's one-day work $= \dfrac{1}{12}$.

Step 2: Q's one-day work $= \dfrac{1}{24}$.

Step 3: Combined one-day work $= \dfrac{1}{12} + \dfrac{1}{24}$.

Step 4: Take LCM of 12 and 24, which is 24: $\frac{2}{24} + \frac{1}{24} = \frac{3}{24}$.

Step 5: $\frac{3}{24} = \frac{1}{8}$.

Step 6: Time together $= \frac{1}{1/8} = 8$ days.

Why other options are wrong:

- Option A (6): less than the combined rate allows, does not match.
- Option B (16): this is the average of 12 and 24, not the work rule.
- Option D (36): sums the days, which is incorrect.

Final Answer: 8 days $\Rightarrow$ C

Answer: (C) Go Back to Q6

Q7.

Solution

Concept — Simple Interest: SI $= \frac{P \times R \times T}{100}$.

Step 1: $P = 6000$, $R = 5$, $T = 4$.

Step 2: SI $= \frac{6000 \times 5 \times 4}{100}$.

Step 3: Numerator $= 6000 \times 5 = 30000$.

Step 4: $30000 \times 4 = 120000$.

Step 5: SI $= \frac{120000}{100} = 1200$.

Why other options are wrong:

- Option B (1500): uses a wrong rate or time.
- Option C (1000): uses 5 years and a different rate mix.
- Option D (1320): uses an incorrect rate of 5.5%.

Final Answer: Rs. 1200 $\Rightarrow$ A

Answer: (A) Go Back to Q7

Q8.

Solution

Concept — Compound Interest: Amount $= P\left(1+\dfrac{R}{100}\right)^{T}$, and CI $=$ Amount $-P$.

Step 1: $P = 5000$, $R = 20$, $T = 2$.

Step 2: Growth factor per year $= 1 + \dfrac{20}{100} = 1.2$.

Step 3: Amount $= 5000 \times 1.2 \times 1.2$.

Step 4: $5000 \times 1.2 = 6000$.

Step 5: $6000 \times 1.2 = 7200$.

Step 6: CI $= 7200 - 5000 = 2200$.

Why other options are wrong:

- Option A (2000): this is only the simple interest.
- Option B (2100): uses a wrong second-year base.
- Option C (2400): overshoots the compounding.

Final Answer: Rs. 2200 $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q8

Q9.

Solution

Concept — Alligation: Ratio $= \dfrac{\text{Dearer price} - \text{Mean}}{\text{Mean} - \text{Cheaper price}}$ for (cheaper : dearer).

Step 1: Cheaper $= 20$, dearer $= 30$, mean $= 24$.

Step 2: Dearer $-$ Mean $= 30 - 24 = 6$.

Step 3: Mean $-$ Cheaper $= 24 - 20 = 4$.

Step 4: Ratio (cheaper : dearer) $= 6 : 4$.

Step 5: Divide both by 2: $6 : 4 = 3 : 2$.

Why other options are wrong:

- Option A (2:3): reverses the two milk types.

- Option B (4:3): comes from an incorrect subtraction.
- Option D (1:1): would give a mean of Rs. 25, not Rs. 24.

Final Answer: $3 : 2 \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q9

Q10.

Solution

Concept — Partnership: For equal time periods, profit is shared in the ratio of the amounts invested.

Step 1: A : B investments $= 5000 : 7000$.

Step 2: Divide both by 1000: $5000 : 7000 = 5 : 7$.

Step 3: Total parts $= 5 + 7 = 12$.

Step 4: A's part $= 5$ out of 12.

Step 5: A's share $= \frac{5}{12} \times 3600 = 5 \times 300 = 1500$.

Why other options are wrong:

- Option A (2100): this is B's share.
- Option B (1800): an equal split, ignoring the ratio.
- Option C (1200): uses a wrong ratio part.

Final Answer: Rs. 1500 $\Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q10

Q11.

Solution

Concept — Linear Equation: Isolate x by undoing subtraction first, then division.

Step 1: $5x - 3 = 17$.

Step 2: Add 3 to both sides: $5x = 17 + 3$.

Step 3: $5x = 20$.

Step 4: Divide both sides by 5: $x = \frac{20}{5}$.

Step 5: $x = 4$.

Why other options are wrong:

- Option A (3): gives $5(3) - 3 = 12$, not 17.
- Option C (5): gives $5(5) - 3 = 22$, not 17.
- Option D (2): gives $5(2) - 3 = 7$, not 17.

Final Answer: $x = 4 \Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q11

Q12.

Solution

Concept — Quadratic Equation: Factorise into two brackets whose product is the constant and sum is the middle coefficient.

Step 1: $x^2 - 9x + 20 = 0$.

Step 2: Find two numbers with product 20 and sum 9: these are 4 and 5.

Step 3: Factorise: $(x - 4)(x - 5) = 0$.

Step 4: So $x = 4$ or $x = 5$.

Step 5: The larger root is 5.

Why other options are wrong:

- Option A (2) and Option B (3): are not roots of the equation.
- Option C (4): is a root, but it is the smaller one.

Final Answer: Larger root $= 5 \Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q12

Q13.

Solution

Concept — Indices: When multiplying powers with the same base, add the exponents: $a^m \times a^n = a^{m+n}$.

Step 1: $3^2 \times 3^3 = 3^{2+3}$.

Step 2: $3^{2+3} = 3^5$.

Step 3: $3^5 = 243$.

Why other options are wrong:

- Option A (81): equals 3^4, from adding wrongly.
- Option C (729): equals 3^6.
- Option D (27): equals 3^3.

Final Answer: $243 \Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q13

Q14.

Solution

Concept — HCF: The HCF is found by taking the lowest power of each prime common to both numbers.

Step 1: Prime factorise: $24 = 2^3 \times 3$.

Step 2: Prime factorise: $36 = 2^2 \times 3^2$.

Step 3: Lowest power of 2 common to both is 2^2; lowest power of 3 is 3^1.

Step 4: HCF $= 2^2 \times 3 = 4 \times 3$.

Step 5: HCF $= 12$.

Why other options are wrong:

- Option B (6): a common factor, but not the highest.
- Option C (72): this is the LCM, not the HCF.
- Option D (18): does not divide 24 exactly.

Final Answer: $12 \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q14

Q15.

Solution

Concept — Arithmetic Progression: The nth term is $a_n = a + (n-1)d$, where a is the first term and d is the common difference.

Step 1: First term $a = 5$.

Step 2: Common difference $d = 9 - 5 = 4$.

Step 3: For the 8th term, $n = 8$: $a_8 = 5 + (8 - 1) \times 4$.

Step 4: $a_8 = 5 + 7 \times 4$.

Step 5: $a_8 = 5 + 28 = 33$.

Why other options are wrong:

- Option A (29): this is the 7th term.
- Option B (37): this is the 9th term.
- Option D (41): this is the 10th term.

Final Answer: 33 $\Rightarrow$ C

Answer: (C) Go Back to Q15

Q16.

Solution

Concept — Order of Operations (BODMAS): Do multiplication and division before addition and subtraction.

Step 1: Expression: $20 - 6 \div 2 + 4 \times 3$.

Step 2: Divide first: $6 \div 2 = 3$.

Step 3: Multiply next: $4 \times 3 = 12$.

Step 4: Rewrite: $20 - 3 + 12$.

Step 5: Add and subtract left to right: $20 - 3 = 17$, then $17 + 12 = 29$.

Why other options are wrong:

- Option A (25): from ignoring the multiplication.
- Option B (27): from a wrong order of operations.
- Option D (31): from adding before dividing.

Final Answer: 29 $\Rightarrow$ C

Answer: (C) Go Back to Q16

Q17.

Solution

Concept — Pythagoras Theorem: In a right triangle, $(\text{hypotenuse})^2 = (\text{leg})^2 + (\text{leg})^2$.

Step 1: The legs are 9 cm and 12 cm.

Step 2: $\text{Hypotenuse}^2 = 9^2 + 12^2$.

Step 3: $9^2 = 81$ and $12^2 = 144$.

Step 4: $\text{Hypotenuse}^2 = 81 + 144 = 225$.

Step 5: $\text{Hypotenuse} = \sqrt{225} = 15$ cm.

Why other options are wrong:

- Option A (11): too small; its square is only 121.
- Option B (21): comes from adding the legs $9 + 12$, which is wrong.
- Option C (13): its square 169 does not equal 225.

Final Answer: 15 cm $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q17

Q18.

Solution

Concept — Circumference of a Circle: Circumference $= 2\pi r$.

Step 1: Radius $r = 14$ cm, and $\pi = \dfrac{22}{7}$.

Step 2: $\text{Circumference} = 2 \times \dfrac{22}{7} \times 14$.

Step 3: $\dfrac{14}{7} = 2$.

Step 4: $\text{Circumference} = 2 \times 22 \times 2$.

Step 5: Circumference $= 88$ cm.

Why other options are wrong:

- Option A (154): this is the area πr^2 with $r = 7$, not the circumference here.
- Option B (44): this is the circumference for radius 7, not 14.
- Option D (616): this is the area πr^2 for radius 14, not the circumference.

Final Answer: 88 cm $\Rightarrow$ C

Answer: (C) Go Back to Q18

Q19.

Solution

Concept — Distance Formula: Distance $= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$.

Step 1: $A(2, 3)$ and $B(6, 6)$.

Step 2: $x_2 - x_1 = 6 - 2 = 4$.

Step 3: $y_2 - y_1 = 6 - 3 = 3$.

Step 4: Distance $= \sqrt{4^2 + 3^2}$.

Step 5: $= \sqrt{16 + 9} = \sqrt{25}$.

Step 6: Distance $= 5$.

Why other options are wrong:

- Option A (4): only the horizontal gap, not the diagonal.
- Option C (7): equals $4 + 3$, from adding instead of using squares.
- Option D (6): does not satisfy the formula.

Final Answer: 5 $\Rightarrow$ B

Answer: (B) Go Back to Q19

Q20.

Solution

Concept — Area of a Triangle: Area $= \frac{1}{2} \times$ base $\times$ height.

Step 1: Base $= 10$ cm, height $= 6$ cm.

Step 2: Area $= \frac{1}{2} \times 10 \times 6$.

Step 3: $10 \times 6 = 60$.

Step 4: Area $= \frac{60}{2} = 30$ cm^2.

Why other options are wrong:

- Option A (60): forgets to halve the product.

- Option C (16): equals base + height, from adding.
- Option D (45): an incorrect product.

Final Answer: 30 $\text{cm}^2 \Rightarrow$ B

Answer: (B) Go Back to Q20

Q21.

Solution

Concept — Volume of a Cube: Volume $=$ edge^3.

Step 1: Edge $= 4$ cm.

Step 2: Volume $= 4^3 = 4 \times 4 \times 4$.

Step 3: $4 \times 4 = 16$.

Step 4: $16 \times 4 = 64$.

Step 5: Volume $= 64$ cm^3.

Why other options are wrong:

- Option B (16): this is the area of one face, 4^2.
- Option C (48): this is a partial surface-area figure, not the volume.
- Option D (96): this is the total surface area 6×4^2.

Final Answer: 64 $\text{cm}^3 \Rightarrow$ A

Answer: (A) Go Back to Q21

Q22.

Solution

Concept — Probability: Probability $= \dfrac{\text{favourable outcomes}}{\text{total outcomes}}$.

Step 1: Red balls $= 3$, blue balls $= 5$.

Step 2: Total balls $= 3 + 5 = 8$.

Step 3: Favourable outcomes (red) $= 3$.

Step 4: Probability $= \dfrac{3}{8}$.

Why other options are wrong:

- Option A $(5/8)$: this is the probability of drawing blue.
- Option B $(1/2)$: would need equal red and blue counts.
- Option D $(1/4)$: would need 2 red out of 8, not 3.

Final Answer: $\frac{3}{8} \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q22

Q23.

Solution

Concept — Combinations: The number of ways to choose r from n is ${}^{n}C_{r} = \frac{n!}{r!\,(n-r)!}$.

Step 1: Here $n = 5$ and $r = 3$.

Step 2: ${}^{5}C_{3} = \frac{5 \times 4 \times 3}{3 \times 2 \times 1}$.

Step 3: Numerator $= 5 \times 4 \times 3 = 60$.

Step 4: Denominator $= 3 \times 2 \times 1 = 6$.

Step 5: ${}^{5}C_{3} = \frac{60}{6} = 10$.

Why other options are wrong:

- Option B (20): does not match the formula.
- Option C (60): this is ${}^{5}P_{3}$ (order counted), not a team.
- Option D (15): comes from a wrong denominator.

Final Answer: $10 \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q23

Q24.

Solution

Concept — Circular Permutation: The number of ways to seat n people around a round table is $(n-1)!$.

Step 1: Here $n = 5$.

Step 2: Number of ways $= (5-1)!$.

Step 3: $= 4!$.

Step 4: $4! = 4 \times 3 \times 2 \times 1 = 24$.

Why other options are wrong:

- Option A (120): this is $5!$, the count for a straight row, not a circle.
- Option B (60): does not match the circular rule.
- Option C (12): far too small.

Final Answer: $24 \Rightarrow \boxed{D}$

Answer: (D) Go Back to Q24

Q25.

Solution

Concept — Table Reading (Total): Add the 2023 column for all four factories.

Step 1: 2023 output: W $= 65$, X $= 70$, Y $= 60$, Z $= 55$.

Step 2: $65 + 70 = 135$.

Step 3: $135 + 60 = 195$.

Step 4: $195 + 55 = 250$.

Why other options are wrong:

- Option A (210): drops part of one factory's output.
- Option B (230): an incorrect sum.
- Option C (240): an incorrect sum.

Final Answer: 250 thousand units $\Rightarrow \boxed{D}$

Answer: (D) Go Back to Q25

Q26.

Solution

Concept — Table Reading (Change): Compute the increase (2023 − 2021) for each factory and compare.

Step 1: W: $65 - 40 = 25$.

Step 2: X: $70 - 60 = 10$.

Step 3: Y: $60 - 30 = 30$.

Step 4: Z: $55 - 50 = 5$.

Step 5: The largest increase is 30, for factory Y.

Why other options are wrong:

- Option A (W): increase is only 25.
- Option C (X): increase is only 10.
- Option D (Z): increase is only 5.

Final Answer: Factory Y $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q26

Q27.

Solution

Concept — Percentage Change: Percentage increase $= \dfrac{\text{increase}}{\text{original}} \times 100$.

Step 1: Y's 2021 output $= 30$, 2023 output $= 60$.

Step 2: Increase $= 60 - 30 = 30$.

Step 3: Percentage increase $= \dfrac{30}{30} \times 100$.

Step 4: $\dfrac{30}{30} = 1$.

Step 5: $1 \times 100 = 100\%$.

Why other options are wrong:

- Option B (50%): uses 60 as the base, which is wrong.
- Option C (75%): an incorrect fraction.
- Option D (40%): does not match the numbers.

Final Answer: 100% $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q27

Q28.

Solution

Concept — Ratio from a Table: Form the ratio and reduce it to lowest terms.

Step 1: W's 2021 output $= 40$; X's 2023 output $= 70$.

Step 2: Ratio $= 40 : 70$.

Step 3: Divide both by 10: $40 : 70 = 4 : 7$.

Step 4: 4 and 7 share no common factor, so the ratio is final.

Why other options are wrong:

- Option B $(7 : 4)$: reverses the two values.
- Option C $(4 : 5)$: uses the wrong second value.
- Option D $(5 : 7)$: does not reduce from $40 : 70$.

Final Answer: $4 : 7 \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q28

Q29.

Solution

Concept — Pie Chart (Share Amount): Amount for a head = its percentage $\times$ total income.

Step 1: Food share $= 25\%$, total income = Rs. 40000.

Step 2: Food amount $= \dfrac{25}{100} \times 40000$.

Step 3: $\dfrac{40000}{100} = 400$.

Step 4: Food amount $= 25 \times 400 = 10000$.

Why other options are wrong:

- Option A (12000): this is the 30% Rent amount.
- Option C (8000): this is the 20% Savings amount.
- Option D (6000): this is the 15% Education amount.

Final Answer: Rs. 10000 $\Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q29

Q30.

Solution

Concept — Pie Chart (Share Amount): Amount for a head = its percentage × total income.

Step 1: Savings share = 20%, total income = Rs. 40000.

Step 2: Savings amount = $\dfrac{20}{100} \times 40000$.

Step 3: $\dfrac{40000}{100} = 400$.

Step 4: Savings amount = $20 \times 400 = 8000$.

Why other options are wrong:

- Option B (6000): this is the 15% Education amount.
- Option C (10000): this is the 25% Food amount.
- Option D (4000): this is the 10% Others amount.

Final Answer: Rs. 8000 $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q30

Q31.

Solution

Concept — Pie Chart (Difference): Take the difference of the two percentages, then apply it to the total income.

Step 1: Rent share = 30%, Education share = 15%.

Step 2: Difference in shares = $30\% - 15\% = 15\%$.

Step 3: Difference amount = $\dfrac{15}{100} \times 40000$.

Step 4: $\dfrac{40000}{100} = 400$.

Step 5: Difference amount = $15 \times 400 = 6000$.

Why other options are wrong:

- Option A (4000): uses a wrong 10% difference.
- Option B (12000): this is the Rent amount alone, not the difference.
- Option C (4500): an incorrect percentage of the total.

Final Answer: Rs. 6000 $\Rightarrow$ D

Answer: (D) Go Back to Q31

Q32.

Solution

Concept — Pie Chart (Central Angle): The central angle of a sector = its percentage $\times 360°$.

Step 1: Savings share $= 20\%$.

Step 2: Central angle $= \dfrac{20}{100} \times 360°$.

Step 3: $\dfrac{360}{100} = 3.6$.

Step 4: Central angle $= 20 \times 3.6 = 72°$.

Why other options are wrong:

- Option A ($90°$): would need a 25% share.
- Option C ($108°$): this is the Rent angle (30%).
- Option D ($36°$): this is the Others angle (10%).

Final Answer: $72° \Rightarrow$ B

Answer: (B) Go Back to Q32

Q33.

Solution

Concept — Data Sufficiency: Test each statement alone, then together, for a unique value of x.

Step 1: Statement I: $x + y = 10$. With two unknowns, x is not fixed. I alone is not sufficient.

Step 2: Statement II: $x - y = 4$. Again two unknowns, x is not fixed. II alone is not sufficient.

Step 3: Both together: add the equations, $(x + y) + (x - y) = 10 + 4$, so $2x = 14$ and $x = 7$. Together they are sufficient.

Step 4: Since neither works alone but both together do, the answer is option C.

Why other options are wrong:

- Option A: I alone leaves x undetermined, so this is false.
- Option B: II alone leaves x undetermined, so this is false.
- Option D: neither statement alone is sufficient, so "each alone" is false.

Final Answer: Both statements together are sufficient $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q33

Q34.

Solution

Concept — Data Sufficiency: The area of a rectangle needs both its length and its breadth.

Step 1: Statement I: length $= 8$ cm and breadth $= 5$ cm, so area $= 8 \times 5 = 40$ cm^2. I alone is sufficient.

Step 2: Statement II: perimeter $= 26$ cm gives length $+$ breadth $= 13$ cm, but the pair could be 8 and 5, or 9 and 4, giving different areas. II alone is not sufficient.

Step 3: Since I alone works and II alone does not, the answer is option A.

Why other options are wrong:

- Option B: II alone gives many possible areas, so this is false.
- Option C: I already suffices alone, so we do not need both.
- Option D: II alone does not suffice, so "each alone" is false.

Final Answer: Statement I alone is sufficient $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q34

Q35.

Solution

Concept — Data Sufficiency: A number is divisible by 6 exactly when it is divisible by both 2 and 3.

Step 1: Statement I: n is divisible by 3. But n could be 9 (not divisible by 6) or 12 (divisible by 6). So parity is unknown and I alone is not sufficient.

Step 2: Statement II: n is divisible by 12. Since 12 is a multiple of 6, any multiple of 12 is also a multiple of 6. So n is definitely divisible by 6. II alone is sufficient.

Step 3: Since II alone works and I alone does not, the answer is option B.

Why other options are wrong:

- Option A: I alone leaves the answer uncertain, so this is false.
- Option C: II already suffices alone, so both are not needed.
- Option D: I alone does not suffice, so "each alone" is false.

Final Answer: Statement II alone is sufficient $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q35

Q36.

Solution

Concept — Data Sufficiency: The perimeter of a square is fixed once its side is known.

Step 1: Statement I: side $= 7$ cm, so perimeter $= 4 \times 7 = 28$ cm. I alone is sufficient.

Step 2: Statement II: area $= 49$ cm^2, so side $= \sqrt{49} = 7$ cm, and perimeter $= 4 \times 7 = 28$ cm. II alone is sufficient.

Step 3: Each statement alone gives the perimeter, so the answer is option D.

Why other options are wrong:

- Option A: II also suffices alone, so "only I" is false.
- Option B: I also suffices alone, so "only II" is false.
- Option C: we do not need both together.

Final Answer: Each statement alone is sufficient $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q36

Answer Key

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