

FDDI AIST Quantitative & Analytical Ability

Sample Paper – 5

Duration: 25 Minutes

Maximum Marks: 25

Instructions

- This paper contains **25** Multiple Choice Questions (Single Correct Answer), modelled on the Quantitative & Analytical Ability section of **FDDI AIST**.
- Each correct answer carries **+1 mark**. There is **no negative marking** for incorrect or unattempted answers.
- Only **one** option is correct per question.
- Syllabus level: **Class 10–12 Mathematics and basic analytical reasoning**.
- Use of mobile phones, calculators, or electronic gadgets is strictly prohibited.

Q1. What is the units digit of 17^{2025} ?

- (A) 7
- (B) 3
- (C) 9
- (D) 1

Q2. How many integers from 1 to 100 are divisible by neither 3 nor 5?

- (A) 40
- (B) 46
- (C) 53
- (D) 60

Q3. If $x + \frac{1}{x} = 5$, find the value of $x^2 + \frac{1}{x^2}$.



- (A) 21
- (B) 23
- (C) 25
- (D) 27

Q4. Rs. 840 is distributed among A, B and C in the ratio 3 : 4 : 5. What is B's share?

- (A) Rs. 200
- (B) Rs. 240
- (C) Rs. 260
- (D) Rs. 280

Q5. A single machine produces 40 items per hour. In how many hours will 7 machines produce 2,800 items?

- (A) 5
- (B) 8
- (C) 10
- (D) 12

Q6. Prices have risen by 20%. By what percentage must a consumer reduce consumption to keep total expenditure unchanged?

- (A) $16.\bar{6}\%$
- (B) 18%
- (C) 20%
- (D) 25%

Q7. 12 pens are sold at the cost price of 10 pens. What is the percentage loss?

- (A) 25%



- (B) 20%
- (C) 16%
- (D) $16.\bar{6}\%$

Q8. The marked price of an article is twice its cost price. A discount of 25% is given on the marked price. What is the profit percentage?

- (A) 40%
- (B) 50%
- (C) 60%
- (D) 75%

Q9. 6 men and 8 women complete a work in 10 days. 26 men and 48 women complete the same work in 2 days. In how many days will 15 men complete the work?

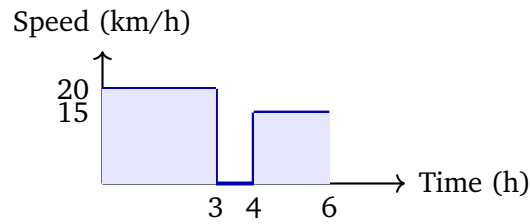
- (A) 5 days
- (B) 6 days
- (C) $\frac{20}{3}$ days
- (D) 8 days

Q10. Pipe A fills a tank in 6 hours, Pipe B in 4 hours. A leak can empty the full tank in 12 hours. With all three active, in how many hours will the tank fill?

- (A) 2 h
- (B) 2.5 h
- (C) 4 h
- (D) 3 h

Q11. A cyclist travels at 20 km/h for 3 hours, rests for 1 hour, then travels at 15 km/h for 2 hours. What is the total distance covered?





- (A) 90 km
- (B) 75 km
- (C) 85 km
- (D) 95 km

Q12. A plane travels a certain distance at a uniform speed. If the speed were 200 km/h more, it would save 1 hour for a 1,200 km journey. What is the original speed of the plane?

- (A) 300 km/h
- (B) 400 km/h
- (C) 500 km/h
- (D) 600 km/h

Q13. The simple interest on a sum for 3 years at 12% per annum is Rs. 1,080. Find the principal.

- (A) Rs. 2,500
- (B) Rs. 2,800
- (C) Rs. 3,200
- (D) Rs. 3,000

Q14. Rs. 10,000 is invested at 5% per annum compound interest, compounded half-yearly, for 1 year. What is the compound interest earned?

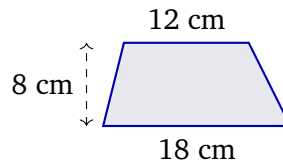
- (A) Rs. 500
- (B) Rs. 512



(C) Rs. 506.25

(D) Rs. 525

- Q15.** A trapezium has parallel sides of 18 cm and 12 cm, and a height of 8 cm. Find its area.



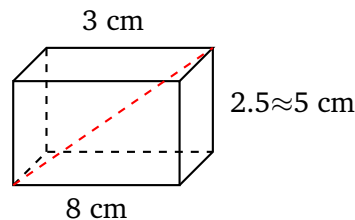
(A) 120 cm^2

(B) 108 cm^2

(C) 100 cm^2

(D) 144 cm^2

- Q16.** A cuboid measures $8 \text{ cm} \times 5 \text{ cm} \times 3 \text{ cm}$. What is the length of its space diagonal?



(A) 7 cm

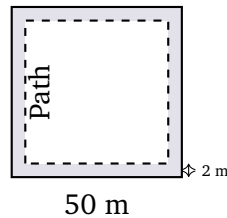
(B) $7\sqrt{2} \text{ cm}$

(C) 10 cm

(D) $\sqrt{99} \text{ cm}$

- Q17.** A square garden has a side of 50 m. A path 2 m wide runs along the inside of all four sides. What is the area of the path?





- (A) 376 m^2
- (B) 380 m^2
- (C) 384 m^2
- (D) 396 m^2

Q18. In a class of 12 students, there are 5 boys and 7 girls. 2 students are chosen at random for a debate. What is the probability that both are girls?

- (A) $\frac{5}{22}$
- (B) $\frac{7}{33}$
- (C) $\frac{7}{44}$
- (D) $\frac{7}{22}$

Q19. In how many ways can 4 boys and 3 girls be arranged in a row if all 3 girls must always stand together?

- (A) 720
- (B) 360
- (C) 480
- (D) 600

Q20. A student's average marks over 5 subjects is 76. In English (which has 2 papers), the average is 82. What is the average over the remaining 3 subjects?

- (A) 70

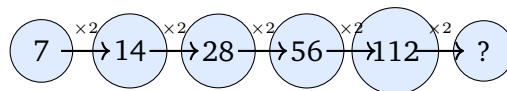


- (B) 72
- (C) 74
- (D) 76

Q21. The average monthly salary for January to June is Rs. 45,000. The combined salary for May and June is Rs. 96,000. What is the average salary for January to April?

- (A) Rs. 42,000
- (B) Rs. 43,000
- (C) Rs. 43,500
- (D) Rs. 44,000

Q22. What is the next term in the series: 7, 14, 28, 56, 112, ____ ?



- (A) 224
- (B) 196
- (C) 210
- (D) 256

Q23. In a certain code, each letter is replaced by its position in the alphabet (A = 1, B = 2, ...) and the positions are summed. If SUN = 54, what is STAR?

- (A) 50
- (B) 54
- (C) 56
- (D) 58

Q24. Arun's son is Rohan. Rohan is Priya's brother. Priya's mother is Sunita. How is Arun related to Sunita?



- (A) Father
- (B) Husband
- (C) Brother
- (D) Son

Q25. A person walks 4 km South, then turns left and walks 3 km. What is the shortest distance from the starting point?

- (A) 4 km
- (B) 3 km
- (C) 5 km
- (D) 7 km



Detailed Solutions

Q1.

Solution

Quick Solution: Concept: Units Digit Cycle. **Chapter:** Number System. The units digit of powers of any integer follows a repeating cycle determined by the units digit of the base. **Answer:** A.

Concept — Units Digit Cycle: The units digit of powers of any integer follows a repeating cycle determined by the units digit of the base. For a base ending in 7, the cycle of units digits is $7 \rightarrow 9 \rightarrow 3 \rightarrow 1$ with period 4.

Step 1 — Identify the cycle:

$$17^1 \rightarrow 7, \quad 17^2 \rightarrow 9, \quad 17^3 \rightarrow 3, \quad 17^4 \rightarrow 1, \quad 17^5 \rightarrow 7, \dots$$

Step 2 — Find position in cycle: $2025 = 4 \times 506 + 1$. Remainder = 1, so units digit equals that of 17^1 , which is 7.

Why other options are wrong:

- Option B (3): corresponds to remainder 3, i.e. 17^3 .
- Option C (9): corresponds to remainder 2, i.e. 17^2 .
- Option D (1): corresponds to remainder 0 (divisible by 4), i.e. 17^4 .

Final Answer: Units digit of 17^{2025} is 7 $\Rightarrow$ A

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

Q2.

Solution

Quick Solution: Concept: Inclusion-Exclusion Principle. **Chapter:** Number System. $|A \cup B| = |A| + |B| - |A \cap B|$. **Answer:** C.

Concept — Inclusion-Exclusion Principle: $|A \cup B| = |A| + |B| - |A \cap B|$. Numbers divisible by *neither* are found by subtracting the union from the total.

Step 1 — Count individual multiples:

- Multiples of 3 up to 100: $\lfloor 100/3 \rfloor = 33$
- Multiples of 5 up to 100: $\lfloor 100/5 \rfloor = 20$
- Multiples of 15 up to 100: $\lfloor 100/15 \rfloor = 6$



Step 2 — Apply inclusion-exclusion: Divisible by 3 or 5 = $33 + 20 - 6 = 47$.

Step 3 — Complement: Neither = $100 - 47 = 53$.

Why other options are wrong:

- Option A (40): omits the inclusion-exclusion correction.
- Option B (46): off-by-one error in counting multiples.
- Option D (60): subtracts only multiples of 5.

Final Answer: 53 integers are divisible by neither 3 nor 5 $\Rightarrow$ C

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

Q3.

Solution

Quick Solution: Concept: Algebraic Identity. **Chapter:** Number System. $(x + \frac{1}{x})^2 = x^2 + 2 + \frac{1}{x^2}$. **Answer:** B.

Concept — Algebraic Identity: $(x + \frac{1}{x})^2 = x^2 + 2 + \frac{1}{x^2}$.

Step 1 — Square both sides:

$$\left(x + \frac{1}{x}\right)^2 = 5^2 = 25.$$

Step 2 — Isolate the required expression:

$$x^2 + 2 + \frac{1}{x^2} = 25 \implies x^2 + \frac{1}{x^2} = 25 - 2 = 23.$$

Why other options are wrong:

- Option A (21): subtracts 4 instead of 2.
- Option C (25): forgets to subtract the middle term +2.
- Option D (27): adds 2 instead of subtracting.

Final Answer: $x^2 + \frac{1}{x^2} = 23 \Rightarrow$ B

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



Q4.

Solution

Quick Solution: Concept: Ratio and Proportion. **Chapter:** Ratio & Proportion. Distribute the total in proportion to each share's ratio part. **Answer:** D.

Concept — Ratio and Proportion: Distribute the total in proportion to each share's ratio part. Total parts = $3 + 4 + 5 = 12$.

Step 1 — Value of one part: $\frac{840}{12} = 70$.

Step 2 — B's share: $B = 4 \times 70 = 280$.

Why other options are wrong:

- Option A (Rs. 200): corresponds to approximately 2.86 parts — not an integer ratio.
- Option B (Rs. 240): equals A's share only if ratio is $3 : 3 : 5$; incorrect here.
- Option C (Rs. 260): does not correspond to any of the three ratio parts.

Final Answer: B's share = Rs. 280 $\Rightarrow$ D

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

Q5.

Solution

Quick Solution: Concept: Work and Rate. **Chapter:** Ratio & Proportion. Total production rate scales linearly with the number of identical machines. **Answer:** C.

Concept — Work and Rate: Total production rate scales linearly with the number of identical machines.

Step 1 — Combined rate of 7 machines: $7 \times 40 = 280$ items per hour.

Step 2 — Required time:

$$\text{Time} = \frac{2800}{280} = 10 \text{ hours.}$$

Why other options are wrong:

- Option A (5 h): $280 \times 5 = 1400 \neq 2800$.
- Option B (8 h): $280 \times 8 = 2240 \neq 2800$.
- Option D (12 h): $280 \times 12 = 3360 \neq 2800$.



Final Answer: Time = 10 hours $\Rightarrow$ C

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

Q6.

Solution

Quick Solution: Concept: Percentage Reduction in Consumption. **Chapter:** Percentage. If price rises by $r\%$, the required reduction in consumption to maintain the same expenditure is $\frac{r}{100+r} \times 100\%$. **Answer:** A.

Concept — Percentage Reduction in Consumption: If price rises by $r\%$, the required reduction in consumption to maintain the same expenditure is $\frac{r}{100+r} \times 100\%$.

Step 1 — Apply formula:

$$\text{Reduction} = \frac{20}{100+20} \times 100 = \frac{20}{120} \times 100 = 16.\bar{6}\%.$$

Step 2 — Verify: Let original price = P , consumption = C . New price = $1.2P$. New consumption = $\frac{5}{6}C$. Expenditure = $1.2P \times \frac{5}{6}C = PC$. Unchanged. ✓

Why other options are wrong:

- Option B (18%): uses an incorrect denominator.
- Option C (20%): equals the price rise, not the consumption reduction.
- Option D (25%): corresponds to a price rise of $33.\bar{3}\%$.

Final Answer: Reduce consumption by $16.\bar{6}\% \Rightarrow$ A

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

Q7.

Solution

Quick Solution: Concept: Profit and Loss. **Chapter:** Profit & Loss. $\text{Loss}\% = \frac{\text{Loss}}{\text{CP}} \times 100$. **Answer:** D.

Concept — Profit and Loss: $\text{Loss}\% = \frac{\text{Loss}}{\text{CP}} \times 100$.

Step 1 — Assign values: Let CP of each pen = 1 unit.



- CP of 12 pens = 12 units.
- SP of 12 pens = CP of 10 pens = 10 units.

Step 2 — Compute loss%:

$$\text{Loss} = 12 - 10 = 2. \quad \text{Loss\%} = \frac{2}{12} \times 100 = 16.\bar{6}\%.$$

Why other options are wrong:

- Option A (25%): $= \frac{3}{12}$, implies a loss of 3 units.
- Option B (20%): $= \frac{2}{10}$; divides by SP instead of CP.
- Option C (16%): close but not exact — the correct value is $16.\bar{6}\%$.

Final Answer: Loss = $16.\bar{6}\% \Rightarrow \boxed{D}$

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

Q8.

Solution

Quick Solution: Concept: Marked Price, Discount, and Profit. **Chapter:** Discount. $\text{SP} = \text{MP} \times \left(1 - \frac{\text{Discount}}{100}\right)$; $\text{Profit\%} = \frac{\text{SP} - \text{CP}}{\text{CP}} \times 100$. **Answer:** B.

Concept — Marked Price, Discount, and Profit: $\text{SP} = \text{MP} \times \left(1 - \frac{\text{Discount}}{100}\right)$; $\text{Profit\%} = \frac{\text{SP} - \text{CP}}{\text{CP}} \times 100$.

Step 1 — Assign values: Let CP = 100. Then MP = $2 \times 100 = 200$.

Step 2 — Compute SP after 25% discount:

$$\text{SP} = 200 \times \left(1 - \frac{25}{100}\right) = 200 \times 0.75 = 150.$$

Step 3 — Profit%:

$$\text{Profit} = 150 - 100 = 50. \quad \text{Profit\%} = \frac{50}{100} \times 100 = 50\%.$$

Why other options are wrong:

- Option A (40%): would require SP = 140, i.e. a 30% discount on MP = 200.
- Option C (60%): would require SP = 160; but 75% of 200 = 150.
- Option D (75%): confuses the discount rate with the profit rate.



Final Answer: Profit = 50% $\Rightarrow$ B

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

Q9.

Solution

Quick Solution: Concept: Time and Work (System of Equations). **Chapter:** Time & Work. Let m = fraction of work done by 1 man per day, w = fraction done by 1 woman per day. **Answer:** C.

Concept — Time and Work (System of Equations): Let m = fraction of work done by 1 man per day, w = fraction done by 1 woman per day.

Step 1 — Set up equations:

$$6m + 8w = \frac{1}{10}, \quad 26m + 48w = \frac{1}{2}.$$

Step 2 — Eliminate w : Multiply the first equation by 6:

$$36m + 48w = \frac{3}{5}.$$

Subtract the second equation:

$$10m = \frac{3}{5} - \frac{1}{2} = \frac{6-5}{10} = \frac{1}{10} \Rightarrow m = \frac{1}{100}.$$

Step 3 — Rate of 15 men: $15m = \frac{15}{100} = \frac{3}{20}$ work/day.

Step 4 — Time: $t = \frac{1}{3/20} = \frac{20}{3}$ days.

Why other options are wrong:

- Option A (5 days): $15m \times 5 = 0.75 \neq 1$.
- Option B (6 days): $15m \times 6 = 0.9 \neq 1$.
- Option D (8 days): $15m \times 8 = 1.2 \neq 1$.

Final Answer: $t = \frac{20}{3}$ days $\Rightarrow$ C

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



Q10.

Solution

Quick Solution: Concept: Pipes and Cisterns. **Chapter:** Pipes & Cisterns. Net rate = (sum of filling rates) – (sum of emptying rates). **Answer:** D.

Concept — Pipes and Cisterns: Net rate = (sum of filling rates) – (sum of emptying rates).

Step 1 — Individual rates (in tank per hour):

- Pipe A (fills): $\frac{1}{6}$
- Pipe B (fills): $\frac{1}{4}$
- Leak (empties): $\frac{1}{12}$

Step 2 — Net rate:

$$\frac{1}{6} + \frac{1}{4} - \frac{1}{12} = \frac{2}{12} + \frac{3}{12} - \frac{1}{12} = \frac{4}{12} = \frac{1}{3} \text{ tank/h.}$$

Step 3 — Time to fill: $t = 3$ hours.

Why other options are wrong:

- Option A (2 h): ignores the leak; A + B combined = $\frac{5}{12}$, giving ≈ 2.4 h.
- Option B (2.5 h): uses incorrect net rate of $\frac{2}{5}$.
- Option C (4 h): uses net rate of $\frac{1}{4}$; forgets pipe B.

Final Answer: Tank fills in 3 hours $\Rightarrow$ D

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

Q11.

Solution

Quick Solution: Concept: Distance, Speed and Time. **Chapter:** Time & Distance. Distance = Speed $\times$ Time. **Answer:** A.

Concept — Distance, Speed and Time: Distance = Speed $\times$ Time. During the rest period, the speed is zero and no distance is covered.

Step 1 — First leg (0 to 3 h): $20 \times 3 = 60$ km.

Step 2 — Rest (3 to 4 h): Distance = 0 km.



Step 3 — Second leg (4 to 6 h): $15 \times 2 = 30$ km.

Total distance: $60 + 0 + 30 = 90$ km.

Why other options are wrong:

- Option B (75 km): erroneously uses $15 \times 5 = 75$ (adds the rest hour to the riding time).
- Option C (85 km): arithmetic error — $60 + 25$ uses wrong speed for second leg.
- Option D (95 km): counts the rest period as travel time at some speed.

Final Answer: Total distance = 90 km $\Rightarrow$ A

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

Q12.

Solution

Quick Solution: Concept: Speed-Time-Distance with Quadratic. **Chapter:** Time & Distance. Time = $\frac{\text{Distance}}{\text{Speed}}$. **Answer:** B.

Concept — Speed-Time-Distance with Quadratic: Time = $\frac{\text{Distance}}{\text{Speed}}$. The difference in travel times gives the equation.

Step 1 — Set up equation: Let original speed = v km/h.

$$\frac{1200}{v} - \frac{1200}{v + 200} = 1.$$

Step 2 — Simplify:

$$1200 \cdot \frac{(v + 200) - v}{v(v + 200)} = 1 \implies 1200 \times 200 = v(v + 200).$$

$$v^2 + 200v - 240000 = 0.$$

Step 3 — Solve by quadratic formula:

$$v = \frac{-200 + \sqrt{200^2 + 4 \times 240000}}{2} = \frac{-200 + \sqrt{40000 + 960000}}{2} = \frac{-200 + 1000}{2} = 400 \text{ km/h.}$$

Why other options are wrong:



- Option A (300 km/h): $1200/300 - 1200/500 = 4 - 2.4 = 1.6 \neq 1$.
- Option C (500 km/h): $1200/500 - 1200/700 \approx 2.4 - 1.71 = 0.69 \neq 1$.
- Option D (600 km/h): $1200/600 - 1200/800 = 2 - 1.5 = 0.5 \neq 1$.

Final Answer: Original speed = 400 km/h $\Rightarrow$ B

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

Q13.

Solution

Quick Solution: Concept: Simple Interest Formula. **Chapter:** Simple Interest.

$SI = \frac{P \times R \times T}{100}$, hence $P = \frac{SI \times 100}{R \times T}$. **Answer:** D.

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

Step 1 — Substitute values:

$$P = \frac{1080 \times 100}{12 \times 3} = \frac{108000}{36} = 3000.$$

Why other options are wrong:

- Option A (Rs. 2,500): $SI = 2500 \times 0.12 \times 3 = \text{Rs. } 900 \neq 1080$.
- Option B (Rs. 2,800): $SI = 2800 \times 0.12 \times 3 = \text{Rs. } 1008 \neq 1080$.
- Option C (Rs. 3,200): $SI = 3200 \times 0.12 \times 3 = \text{Rs. } 1152 \neq 1080$.

Final Answer: Principal = Rs. 3,000 $\Rightarrow$ D

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

Q14.

Solution

Quick Solution: Concept: Compound Interest (Half-Yearly Compounding).

Chapter: Compound Interest. When compounded half-yearly, the rate per period $= \frac{R}{2}$ and number of periods $= 2T$. **Answer:** C.

Concept — Compound Interest (Half-Yearly Compounding): When compounded half-yearly, the rate per period $= \frac{R}{2}$ and number of periods $= 2T$.

Step 1 — Rate per half-year: $\frac{5}{2} = 2.5\%$ per period.



Step 2 — Number of periods: $2 \times 1 = 2$.

Step 3 — Amount:

$$A = 10000 \times (1.025)^2 = 10000 \times 1.050625 = 10506.25.$$

Step 4 — Compound interest:

$$CI = 10506.25 - 10000 = \mathbf{506.25}.$$

Why other options are wrong:

- Option A (Rs. 500): simple interest at 5% for 1 year (10000×0.05).
- Option B (Rs. 512): uses 4% half-yearly rate or 2% per period (incorrect).
- Option D (Rs. 525): uses a rate of 2.625% per period.

Final Answer: $CI = \text{Rs. } 506.25 \Rightarrow \boxed{C}$

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

Q15.

Solution

Quick Solution: Concept: Area of Trapezium. **Chapter:** Mensuration 2D. Area = $\frac{1}{2}(a + b) \times h$, where a and b are the two parallel sides and h is the perpendicular height. **Answer:** A.

Concept — Area of Trapezium: Area = $\frac{1}{2}(a + b) \times h$, where a and b are the two parallel sides and h is the perpendicular height.

Step 1 — Substitute values:

$$\text{Area} = \frac{1}{2}(18 + 12) \times 8 = \frac{1}{2} \times 30 \times 8 = \mathbf{120 \text{ cm}^2}.$$

Why other options are wrong:

- Option B (108 cm^2): uses height = 7.2 instead of 8.
- Option C (100 cm^2): applies $\frac{18+12}{2} \times \frac{8+?}{2}$; misapplied averaging.
- Option D (144 cm^2): uses only the longer base: $18 \times 8 = 144$; ignores the trapezium formula.

Final Answer: Area = $120 \text{ cm}^2 \Rightarrow \boxed{A}$



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

Q16.

Solution

Quick Solution: Concept: Space Diagonal of a Cuboid. **Chapter:** Mensuration 3D. $d = \sqrt{l^2 + b^2 + h^2}$. **Answer:** B.

Concept — Space Diagonal of a Cuboid: $d = \sqrt{l^2 + b^2 + h^2}$.

Step 1 — Compute:

$$d = \sqrt{8^2 + 5^2 + 3^2} = \sqrt{64 + 25 + 9} = \sqrt{98} = \sqrt{49 \times 2} = 7\sqrt{2} \text{ cm.}$$

Why other options are wrong:

- Option A (7 cm): $7^2 = 49 \neq 98$.
- Option C (10 cm): $10^2 = 100 \neq 98$.
- Option D ($\sqrt{99}$): arises from $64 + 25 + 10 = 99$; uses wrong value for 3^2 .

Final Answer: Space diagonal = $7\sqrt{2}$ cm $\Rightarrow$ **B**

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

Q17.

Solution

Quick Solution: Concept: Area of Path Inside a Square. **Chapter:** Mensuration Combined. Area of path = area of outer square – area of inner square. **Answer:** C.

Concept — Area of Path Inside a Square: Area of path = area of outer square – area of inner square.

Step 1 — Outer area: $50^2 = 2500 \text{ m}^2$.

Step 2 — Inner side length: Path width = 2 m on each side, so inner side = $50 - 2 \times 2 = 46 \text{ m}$.

Step 3 — Inner area: $46^2 = 2116 \text{ m}^2$.

Step 4 — Path area: $2500 - 2116 = 384 \text{ m}^2$.

Why other options are wrong:



- Option A (376 m^2): uses inner side = 47 m (subtracts only one path width).
- Option B (380 m^2): uses inner side $\approx 47.4 \text{ m}$.
- Option D (396 m^2): uses inner side = 45 m ($50 - 5 = 45$); wrong total subtraction.

Final Answer: Path area = $384 \text{ m}^2 \Rightarrow \boxed{C}$

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

Q18.

Solution

Quick Solution: Concept: Probability using Combinations. **Chapter:** Probability.
. Answer: D.

Concept — Probability using Combinations:

$$P(\text{both girls}) = \frac{\binom{7}{2}}{\binom{12}{2}}.$$

Step 1 — Favourable outcomes: $\binom{7}{2} = \frac{7 \times 6}{2} = 21.$

Step 2 — Total outcomes: $\binom{12}{2} = \frac{12 \times 11}{2} = 66.$

Step 3 — Probability:

$$P = \frac{21}{66} = \frac{7}{22}.$$

Why other options are wrong:

- Option A ($\frac{5}{22}$): numerator uses boys: $\binom{5}{2} = 10$; $10/66 = 5/33 \neq 5/22$.
- Option B ($\frac{7}{33}$): equals $14/66$; one favourable case is missing.
- Option C ($\frac{7}{44}$): uses incorrect total of 44 instead of 66.

Final Answer: $P = \frac{7}{22} \Rightarrow \boxed{D}$

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



Q19.

Solution

Quick Solution: Concept: Permutations with Grouping. **Chapter:** Combinations. Treat all 3 girls as a single block. **Answer:** A.

Concept — Permutations with Grouping: Treat all 3 girls as a single block. The block + 4 boys = 5 objects to arrange, then arrange girls within the block.

Step 1 — Arrange 5 objects (including the girl-block): $5! = 120$ ways.

Step 2 — Arrange 3 girls within the block: $3! = 6$ ways.

Total arrangements: $120 \times 6 = 720$.

Why other options are wrong:

- Option B (360): uses $5! \times 3 = 360$; replaces $3! = 6$ with 3, which is incorrect.
- Option C (480): $4! \times 5 \times 4 = 480$; incorrect grouping method.
- Option D (600): $5! \times 5 = 600$; uses 5 as the internal factor instead of $3! = 6$.

Final Answer: $5! \times 3! = 720 \Rightarrow \boxed{A}$

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

Q20.

Solution

Quick Solution: Concept: Averages and Totals. **Chapter:** Averages. Total marks = average $\times$ number of subjects. **Answer:** B.

Concept — Averages and Totals: Total marks = average $\times$ number of subjects. Use this to find partial averages.

Step 1 — Total marks over 5 subjects: $5 \times 76 = 380$.

Step 2 — English marks (2 papers): $2 \times 82 = 164$.

Step 3 — Remaining 3 subjects total: $380 - 164 = 216$.

Step 4 — Average for 3 subjects: $\frac{216}{3} = 72$.

Why other options are wrong:

- Option A (70): $3 \times 70 = 210 \neq 216$.
- Option C (74): $3 \times 74 = 222 \neq 216$.



- Option D (76): equals the overall average; a coincidence, not the correct partial average.

Final Answer: Average over remaining 3 subjects = 72 $\Rightarrow$ B

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

Q21.

Solution

Quick Solution: Concept: Monthly Averages and Partial Sums. **Chapter:** Averages. Total for a period = average $\times$ number of months. **Answer:** C.

Concept — Monthly Averages and Partial Sums: Total for a period = average $\times$ number of months.

Step 1 — Total salary (January to June): $6 \times 45000 = 270000$.

Step 2 — Subtract May + June: $270000 - 96000 = 174000$.

Step 3 — Average for January to April:

$$\frac{174000}{4} = 43500.$$

Why other options are wrong:

- Option A (Rs. 42,000): $4 \times 42000 = 168000 \neq 174000$.
- Option B (Rs. 43,000): $4 \times 43000 = 172000 \neq 174000$.
- Option D (Rs. 44,000): $4 \times 44000 = 176000 \neq 174000$.

Final Answer: Average Jan–Apr salary = Rs. 43,500 $\Rightarrow$ C

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

Q22.

Solution

Quick Solution: Concept: Geometric Sequence ($\times 2$ pattern). **Chapter:** Analytical — Series. Each term is obtained by multiplying the previous term by a common ratio of 2. **Answer:** A.

Concept — Geometric Sequence ($\times 2$ pattern): Each term is obtained by multiplying the previous term by a common ratio of 2.



Step 1 — Verify the pattern:

$$7 \xrightarrow{\times 2} 14 \xrightarrow{\times 2} 28 \xrightarrow{\times 2} 56 \xrightarrow{\times 2} 112.$$

Step 2 — Next term: $112 \times 2 = 224$.

Why other options are wrong:

- Option B (196): applies the increment $112 - 28 = 84$; no systematic justification.
- Option C (210): applies $112 + 98$; no pattern basis.
- Option D (256): $= 2^8$; confuses with the pure power-of-2 sequence starting at 1.

Final Answer: Next term $= 224 \Rightarrow \boxed{A}$

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

Q23.

Solution

Quick Solution: Concept: Coding-Decoding by Alphabet Position. **Chapter:** Coding-Decoding. Each letter is replaced by its serial position: A= 1, B= 2, ..., Z= 26. **Answer:** D.

Concept — Coding-Decoding by Alphabet Position: Each letter is replaced by its serial position: A= 1, B= 2, ..., Z= 26. The code value is the sum of positions.

Step 1 — Verify with SUN:

$$S = 19, \quad U = 21, \quad N = 14. \quad \text{Sum} = 19 + 21 + 14 = 54. \quad \checkmark$$

Step 2 — Compute STAR:

$$S = 19, \quad T = 20, \quad A = 1, \quad R = 18. \quad \text{Sum} = 19 + 20 + 1 + 18 = 58.$$

Why other options are wrong:

- Option A (50): omits the value of one letter (e.g. T= 20 not added).
- Option B (54): same code as SUN — a coincidence not supported by calculation.
- Option C (56): off by 2; possibly uses A= 3 instead of A= 1.



Final Answer: STAR = 58 $\Rightarrow$ D

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

Q24.

Solution

Quick Solution: Concept: Blood Relations. **Chapter:** Blood Relations. Build the family tree step by step from each given statement. **Answer:** B.

Concept — Blood Relations: Build the family tree step by step from each given statement.

Step 1 — Map the relations:

- Arun's son $\rightarrow$ Rohan. (Arun is Rohan's father.)
- Rohan's sister $\rightarrow$ Priya. (Priya and Rohan have the same parents.)
- Priya's mother $\rightarrow$ Sunita. (Sunita is also Rohan's mother.)

Step 2 — Conclude: Since Sunita is Rohan's mother and Arun is Rohan's father, Arun and Sunita are **husband and wife**. Therefore, Arun is Sunita's **husband**.

Why other options are wrong:

- Option A (Father): Arun is Rohan's father, not Sunita's father.
- Option C (Brother): there is no sibling relationship between Arun and Sunita.
- Option D (Son): Arun is a parent in this family, not a child.

Final Answer: Arun is Sunita's husband $\Rightarrow$ B

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

Q25.

Solution

Quick Solution: Concept: Direction Sense and Pythagorean Theorem. **Chapter:** Direction Sense. When facing South, turning left means turning to face East. **Answer:** C.

Concept — Direction Sense and Pythagorean Theorem: When facing South, turning left means turning to face East. The two displacements are perpendicular, forming a right-angled triangle.



Step 1 — Displacement vectors: 4 km South + 3 km East.

Step 2 — Shortest (straight-line) distance:

$$d = \sqrt{4^2 + 3^2} = \sqrt{16 + 9} = \sqrt{25} = 5 \text{ km.}$$

Why other options are wrong:

- Option A (4 km): only the southward component; ignores eastward displacement.
- Option B (3 km): only the eastward component; ignores southward displacement.
- Option D (7 km): adds the two distances ($4 + 3 = 7$) instead of applying Pythagoras.

Final Answer: Shortest distance = 5 km $\Rightarrow$ C

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



Answer Key

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

