FDDI AIST Quantitative & Analytical Ability

Sample Paper – 2

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. Two consecutive integers have a product of 132. What are the two integers?

(A) 10 and 11

(B) 11 and 12

(C) 12 and 13

(D) 13 and 14

Q2. What is the largest 4-digit number divisible by 7?

(A) 9993

(B) 9995

(C) 9996

(D) 9999

Q3. Express 360 as a product of prime factors.

(A) $2^2 \times 3^2 \times 5$

(B) $2^3 \times 3 \times 5^2$

(C) $2^2 \times 3^3 \times 5$

(D) $2^3 \times 3^2 \times 5$

Q4. The ratio of boys to girls in a class is 7:5. When 8 more girls join, the ratio becomes equal (1:1). How many girls were there originally?

(A) 20

(B) 24

(C) 28

(D) 32

Q5. Rs. 1,200 is divided among A, B, and C in the ratio 2:3:5. What is the smallest share?

(A) Rs. 180

(B) Rs. 240

(C) Rs. 360

(D) Rs. 600

Q6. A city's population increased from 80,000 to 96,000. What is the percentage increase?

(A) 10%

(B) 15%

(C) 20%

(D) 25%

Q7. A trader buys an article for Rs. 250 and sells it for Rs. 200. What is the loss percentage?

(A) 15%

(B) 18%

(C) 22%

(D) 20%

Q8. Two successive discounts of 20% and 10% are given on an article marked at Rs. 1,000. What is the final selling price?

(A) Rs. 720

(B) Rs. 700

(C) Rs. 680

(D) Rs. 650

Q9. 10 men can finish a work in 15 days. In how many days can 6 men finish the same work?

(A) 20 days

(B) 25 days

(C) 30 days

(D) 35 days

Q10. Two pipes can fill a tank in 20 minutes and 30 minutes respectively. Both pipes are opened together. In how many minutes will the tank be full?

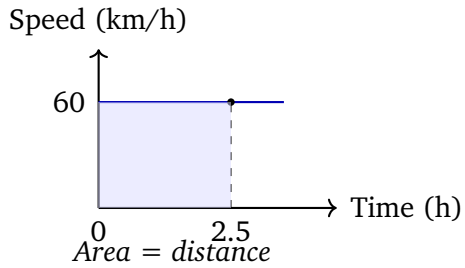
(A) 10 min

(B) 11 min

(C) 12 min

(D) 15 min

Q11. A car travels at a uniform speed of 60 km/h. Using the speed-time graph shown below, what distance does it cover in 2.5 hours?



(A) 120 km

(B) 130 km

(C) 140 km

(D) 150 km

Q12. Two trains 200 m and 250 m long approach each other on parallel tracks at speeds of 54 km/h and 36 km/h respectively. How long will they take to completely cross each other?

(A) 18 s

(B) 20 s

(C) 22 s

(D) 24 s

Q13. A sum of Rs. 12,000 becomes Rs. 14,400 in 3 years at simple interest. What is the annual rate of interest?

(A) 5%

(B) $6\frac{2}{3}\%$

(C) 8%

(D) 10%

Q14. Rs. 5,000 is invested at 4% per half-year compound interest for 1 year. What is the compound interest earned?

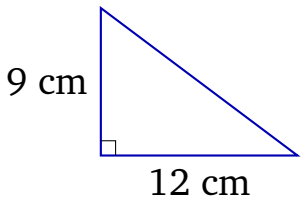
(A) Rs. 380

(B) Rs. 400

(C) Rs. 408

(D) Rs. 420

Q15. A right-angled triangle has legs of 9 cm and 12 cm. What is the area of the triangle?



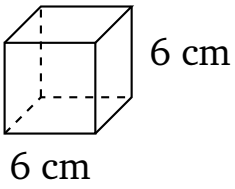
(A) 40 cm^2

(B) 48 cm^2

(C) 52 cm^2

(D) 54 cm^2

Q16. A solid cube has edge length 6 cm. What is its total surface area?



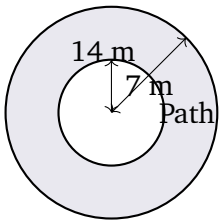
(A) 216 cm^2

(B) 256 cm^2

(C) 196 cm^2

(D) 324 cm^2

Q17. A circular path has outer radius 14 m and inner radius 7 m. Find the area of the path. (Use $\pi = \frac{22}{7}$)



(A) 420 m^2

(B) 462 m^2

(C) 480 m^2

(D) 500 m^2

Q18. A standard pack of 52 cards. One card is drawn at random. What is the probability of drawing a King?

(A) $\frac{1}{52}$

(B) $\frac{1}{26}$

(C) $\frac{1}{13}$

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

Q19. In how many ways can a committee of 3 be chosen from 5 men and 3 women such that at least 1 woman is included?

(A) 30

(B) 36

(C) 42

(D) 46

Q20. The average marks of a class is 68. The top scorer gets 89 marks. The rest of the students have an average of 65. How many students are in the class?

(A) 8

(B) 10

(C) 12

(D) 15

Q21. A worker earns Rs. 200 per day for 25 days and Rs. 50 per day for 5 days in a month. What is the average daily earning for that month (30 days)?

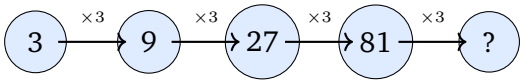
(A) Rs. 165

(B) Rs. 175

(C) Rs. 180

(D) Rs. 185

Q22. What is the next term in the series: $3,\ 9,\ 27,\ 81,\ ____$?



(A) 162

(B) 216

(C) 243

(D) 324

Q23. Each letter is shifted one place forward in the alphabet (A→B, B→C, . . .). Using this rule, the code for the word **GRAPE** is:

(A) HSBQE

(B) HRAOF

(C) GRAQF

(D) HSBQF

Q24. Pointing to a photograph, Ravi says, "He is the son of my mother's husband." How is the person in the photograph related to Ravi?

(A) Brother

(B) Father

(C) Son

(D) Cousin

Q25. In how many distinct ways can 4 people be seated around a circular table?

(A) 24

(B) 6

(C) 12

(D) 16

Detailed Solutions

Q1.

Solution

Quick Solution: Concept: Consecutive Integers. **Chapter:** Number System. If two consecutive integers are n and $n+1$, their product is $n(n+1)$. **Answer:** B.

Concept — Consecutive Integers: If two consecutive integers are n and $n+1$, their product is $n(n+1)$.

Step 1 — Set up the equation: Let the integers be n and $n+1$. Then $n(n+1) = 132$.

Step 2 — Test the options: $11 \times 12 = 132$ ✓

Step 3 — Verify other pairs: $10 \times 11 = 110 \neq 132$; $12 \times 13 = 156 \neq 132$.

Why other options are wrong:

- Option A: $10 \times 11 = 110 \neq 132$
- Option C: $12 \times 13 = 156 \neq 132$
- Option D: $13 \times 14 = 182 \neq 132$

Final Answer: The two consecutive integers are 11 and 12 $\Rightarrow \boxed{B}$

Answer: (B) Go Back to Q1

Q2.

Solution

Quick Solution: Concept: Divisibility. **Chapter:** Number System. The largest n-digit multiple of k is $\lfloor \max/k \rfloor \times k$. **Answer:** C.

Concept — Divisibility: The largest n-digit multiple of k is $\lfloor \max/k \rfloor \times k$.

Step 1 — Divide 9999 by 7: $9999 \div 7 = 1428.43\ldots$, so the largest integer quotient is 1428.

Step 2 — Multiply back: $1428 \times 7 = 9996$.

Verification: $9996 \div 7 = 1428$ exactly. The next multiple, $1429 \times 7 = 10003$, exceeds 9999.

Why other options are wrong:

- Option A: $9993 \div 7 = 1427.57\ldots$ (not divisible)

- Option B: $9995 \div 7 = 1427.86\ldots$ (not divisible)
- Option D: $9999 \div 7 = 1428.43\ldots$ (not divisible)

Final Answer: The largest 4-digit number divisible by 7 is **9996** $\Rightarrow \boxed{C}$

Answer: (C) Go Back to Q2

Q3.

Solution

Quick Solution: Concept: Prime Factorisation. **Chapter:** Number System. Repeatedly divide by prime numbers starting from the smallest. **Answer:** D.

Concept — Prime Factorisation: Repeatedly divide by prime numbers starting from the smallest.

Step 1 — Divide by 2: $360 \div 2 = 180$; $180 \div 2 = 90$; $90 \div 2 = 45$ (not divisible by 2 further).

Step 2 — Divide by 3: $45 \div 3 = 15$; $15 \div 3 = 5$ (not divisible by 3 further).

Step 3 — Divide by 5: $5 \div 5 = 1$.

Result: $360 = 2^3 \times 3^2 \times 5$.

Why other options are wrong:

- Option A: $2^2 \times 3^2 \times 5 = 4 \times 9 \times 5 = 180 \neq 360$
- Option B: $2^3 \times 3 \times 5^2 = 8 \times 3 \times 25 = 600 \neq 360$
- Option C: $2^2 \times 3^3 \times 5 = 4 \times 27 \times 5 = 540 \neq 360$

Final Answer: $360 = 2^3 \times 3^2 \times 5 \Rightarrow \boxed{D}$

Answer: (D) Go Back to Q3

Q4.

Solution

Quick Solution: Concept: Ratio & Proportion. **Chapter:** Ratio & Proportion. Let the common multiplier be k; then boys $= 7k$, girls $= 5k$. **Answer:** A.

Concept — Ratio & Proportion: Let the common multiplier be k; then boys $= 7k$, girls $= 5k$.

Step 1 — After 8 girls join: New number of girls $= 5k + 8$. The new ratio is $1 : 1$,

so:

$$7k = 5k + 8$$

Step 2 — Solve for k: $2k = 8 \Rightarrow k = 4$.

Step 3 — Original number of girls: $5k = 5 \times 4 = 20$.

Verification: Boys $= 7 \times 4 = 28$; Girls after joining $= 20 + 8 = 28$. Ratio $= 28 : 28 = 1 : 1$ ✓

Why other options are wrong:

- Option B: 24 girls $\Rightarrow k = 4.8$ (non-integer, not a valid solution)
- Option C: 28 girls $\Rightarrow k = 5.6$ (non-integer)
- Option D: 32 girls $\Rightarrow k = 6.4$ (non-integer)

Final Answer: Originally there were **20** girls $\Rightarrow \boxed{A}$

Answer: (A) Go Back to Q4

Q5.

Solution

Quick Solution: Concept: Ratio Division. **Chapter:** Ratio & Proportion. Divide the total amount in proportion to the given ratio parts. **Answer:** B.

Concept — Ratio Division: Divide the total amount in proportion to the given ratio parts.

Step 1 — Find total parts: Ratio $= 2 : 3 : 5$; total parts $= 2 + 3 + 5 = 10$.

Step 2 — Compute each share:

$$A = \frac{2}{10} \times 1200 = \text{Rs. } 240, \quad B = \frac{3}{10} \times 1200 = \text{Rs. } 360, \quad C = \frac{5}{10} \times 1200 = \text{Rs. } 600$$

Step 3 — Identify smallest share: A's share $=$ Rs. 240 (ratio part 2, the smallest).

Why other options are wrong:

- Option A: Rs. 180 does not correspond to any ratio part in 2:3:5
- Option C: Rs. 360 is B's share (ratio part 3), not the smallest
- Option D: Rs. 600 is C's share (ratio part 5), the largest

Final Answer: Smallest share is Rs. 240 $\Rightarrow \boxed{B}$

Answer: (B) Go Back to Q5

Q6.

Solution

Quick Solution: Concept: Percentage Increase. **Chapter:** Percentage. . **Answer:** C.

Concept — Percentage Increase:

$$\% \text{ increase} = \frac{\text{New Value} - \text{Original Value}}{\text{Original Value}} \times 100$$

Step 1 — Find the increase: $96{,}000 - 80{,}000 = 16{,}000$.

Step 2 — Calculate percentage:

$$\frac{16{,}000}{80{,}000} \times 100 = \frac{1}{5} \times 100 = 20\%$$

Why other options are wrong:

- Option A: 10% $\Rightarrow$ increase $= 8{,}000$, new population $= 88{,}000 \neq 96{,}000$
- Option B: 15% $\Rightarrow$ increase $= 12{,}000$, new population $= 92{,}000 \neq 96{,}000$
- Option D: 25% $\Rightarrow$ increase $= 20{,}000$, new population $= 1{,}00{,}000 \neq 96{,}000$

Final Answer: Percentage increase $= 20\% \Rightarrow \boxed{C}$

Answer: (C) Go Back to Q6

Q7.

Solution

Quick Solution: Concept: Loss Percentage. **Chapter:** Profit & Loss. . **Answer:** D.

Concept — Loss Percentage:

$$\text{Loss\%} = \frac{\text{Cost Price} - \text{Selling Price}}{\text{Cost Price}} \times 100$$

Step 1 — Find the loss: Loss $= 250 - 200 =$ Rs. 50.

Step 2 — Calculate loss%:

$$\text{Loss\%} = \frac{50}{250} \times 100 = \frac{1}{5} \times 100 = 20\%$$

Why other options are wrong:

- Option A: 15% loss $\Rightarrow$ SP $= 250 \times 0.85 =$ Rs. 212.50 $\neq$ Rs. 200
- Option B: 18% loss $\Rightarrow$ SP $= 250 \times 0.82 =$ Rs. 205 $\neq$ Rs. 200
- Option C: 22% loss $\Rightarrow$ SP $= 250 \times 0.78 =$ Rs. 195 $\neq$ Rs. 200

Final Answer: Loss percentage $= 20\% \Rightarrow \boxed{D}$

Answer: (D) Go Back to Q7

Q8.

Solution

Quick Solution: Concept: Successive Discounts. **Chapter:** Discount. Apply each discount sequentially on the already-reduced price; do not add percentages directly. **Answer:** A.

Concept — Successive Discounts: Apply each discount sequentially on the already-reduced price; do not add percentages directly.

Step 1 — Apply first discount of 20%:

$$1000 \times (1 - 0.20) = 1000 \times 0.80 = \text{Rs. } 800$$

Step 2 — Apply second discount of 10%:

$$800 \times (1 - 0.10) = 800 \times 0.90 = \text{Rs. } 720$$

Note: Two successive discounts of 20% and 10% are NOT equivalent to a single discount of 30%.

Why other options are wrong:

- Option B: Rs. 700 $= 1000 \times 0.70$ (single 30% discount, which incorrectly adds the two rates)
- Option C: Rs. 680 does not correspond to any correct sequential discount calculation
- Option D: Rs. 650 implies a total discount of 35%, which is also incorrect

Final Answer: Final selling price = Rs. 720 $\Rightarrow \boxed{A}$

Answer: (A) Go Back to Q8

Q9.

Solution

Quick Solution: Concept: Work–Men–Days. **Chapter:** Time & Work. Total work = Men $\times$ Days (constant, assuming equal work rate per man per day). **Answer:** B.

Concept — Work–Men–Days: Total work = Men $\times$ Days (constant, assuming equal work rate per man per day).

Step 1 — Find total work: $10 \times 15 = 150$ man-days.

Step 2 — Find days for 6 men:

$$6 \times d = 150 \implies d = \frac{150}{6} = 25 \text{ days}$$

Why other options are wrong:

- Option A: 20 days $\Rightarrow 6 \times 20 = 120 \neq 150$ man-days
- Option C: 30 days $\Rightarrow 6 \times 30 = 180 \neq 150$ man-days
- Option D: 35 days $\Rightarrow 6 \times 35 = 210 \neq 150$ man-days

Final Answer: 6 men will finish the work in **25 days** $\Rightarrow \boxed{B}$

Answer: (B) Go Back to Q9

Q10.

Solution

Quick Solution: Concept: Pipes & Cisterns. **Chapter:** Pipes & Cisterns. When two pipes work together, add their individual filling rates (fraction of tank per minute). **Answer:** C.

Concept — Pipes & Cisterns: When two pipes work together, add their individual filling rates (fraction of tank per minute).

Step 1 — Individual rates: Pipe 1 fills $\frac{1}{20}$ of the tank per minute; Pipe 2 fills $\frac{1}{30}$ per minute.

Step 2 — Combined rate:

$$\frac{1}{20}+\frac{1}{30}=\frac{3}{60}+\frac{2}{60}=\frac{5}{60}=\frac{1}{12}\text{ tank per minute}$$

Step 3 — Time to fill:

$$t=\frac{1}{1/12}=12\text{ minutes}$$

Why other options are wrong:

- Option A: 10 min $\Rightarrow$ would require combined rate $=\frac{1}{10}$, but actual rate $=\frac{1}{12}$
- Option B: 11 min is not a factor of either 20 or 30
- Option D: 15 min $\Rightarrow$ rate $=\frac{1}{15}\neq\frac{1}{12}$

Final Answer: Tank fills in **12 minutes** $\Rightarrow \boxed{C}$

Answer: (C) Go Back to Q10

Q11.

Solution

Quick Solution: Concept: Speed-Time Graph. **Chapter:** Time & Distance. For a uniform speed, the speed-time graph is a horizontal line. **Answer:** D.

Concept — Speed-Time Graph: For a uniform speed, the speed-time graph is a horizontal line. The distance covered equals the *area under the graph* (a rectangle).

Step 1 — Read values from graph: Speed $=60$ km/h (constant horizontal line); Time $=2.5$ h.

Step 2 — Calculate distance:

$$d=v\times t=60\times 2.5=150\text{ km}$$

The shaded blue rectangle in the graph has width 2.5 and height 60, confirming this result.

Why other options are wrong:

- Option A: 120 km $=60\times 2.0$ h (uses the wrong time of 2.0 h instead of 2.5 h)
- Option B: 130 km $=60\times 2.17$ h (incorrect time reading)

- Option C: 140 km $= 60 \times 2.33$ h (incorrect time reading)

Final Answer: Distance covered $=$ **150** km $\Rightarrow \boxed{D}$

Answer: (D) Go Back to Q11

Q12.

Solution

Quick Solution: Concept: Trains Crossing (Opposite Directions). **Chapter:** Time & Distance. Relative speed $=$ sum of individual speeds. **Answer:** A.

Concept — Trains Crossing (Opposite Directions): Relative speed $=$ sum of individual speeds. Time $= \dfrac{\text{Sum of train lengths}}{\text{Relative speed}}$.

Step 1 — Total length to be covered: $200 + 250 = 450$ m.

Step 2 — Convert relative speed to m/s:

$$(54 + 36) \text{ km/h} = 90 \text{ km/h} = 90 \times \frac{1000}{3600} = 25 \text{ m/s}$$

Step 3 — Time to cross:

$$t = \frac{450}{25} = 18 \text{ seconds}$$

Why other options are wrong:

- Option B: 20 s $\Rightarrow$ total distance covered $= 20 \times 25 = 500$ m $\neq 450$ m
- Option C: 22 s $\Rightarrow 22 \times 25 = 550$ m $\neq 450$ m
- Option D: 24 s $\Rightarrow 24 \times 25 = 600$ m $\neq 450$ m

Final Answer: Time to completely cross $=$ **18** s $\Rightarrow \boxed{A}$

Answer: (A) Go Back to Q12

Q13.

Solution

Quick Solution: Concept: Simple Interest. **Chapter:** Simple Interest. . **Answer:** B.

Concept — Simple Interest:

$$\text{SI} = \frac{P \times R \times T}{100} \quad \Rightarrow \quad R = \frac{\text{SI} \times 100}{P \times T}$$

Step 1 — Find SI: $\text{SI} = 14{,}400 - 12{,}000 = \text{Rs. } 2{,}400$.

Step 2 — Calculate annual rate:

$$R = \frac{2400 \times 100}{12000 \times 3} = \frac{2{,}40{,}000}{36{,}000} = 6.\overline{6}\% = 6\tfrac{2}{3}\%$$

Why other options are wrong:

- Option A: $5\% \Rightarrow \text{SI} = \frac{12000 \times 5 \times 3}{100} = \text{Rs. } 1{,}800 \neq \text{Rs. } 2{,}400$
- Option C: $8\% \Rightarrow \text{SI} = \frac{12000 \times 8 \times 3}{100} = \text{Rs. } 2{,}880 \neq \text{Rs. } 2{,}400$
- Option D: $10\% \Rightarrow \text{SI} = \frac{12000 \times 10 \times 3}{100} = \text{Rs. } 3{,}600 \neq \text{Rs. } 2{,}400$

Final Answer: Rate of interest $= 6\frac{2}{3}\% \Rightarrow \boxed{B}$

Answer: (B) Go Back to Q13

Q14.

Solution

Quick Solution: Concept: Compound Interest (Half-Yearly). **Chapter:** Compound Interest. $A = P\left(1 + \frac{r}{100}\right)^n$, where r is the rate per compounding period and n is the total number of periods. **Answer:** C.

Concept — Compound Interest (Half-Yearly): $A = P\left(1 + \frac{r}{100}\right)^n$, where r is the rate per compounding period and n is the total number of periods.

Step 1 — Identify parameters: $P = \text{Rs. } 5{,}000$; rate per half-year $= 4\%$; periods $= 2$ (since 1 year $= 2$ half-years).

Step 2 — Calculate amount:

$$A = 5000 \times (1.04)^2 = 5000 \times 1.0816 = \text{Rs. } 5{,}408$$

Step 3 — Find compound interest:

$$\text{CI} = A - P = 5408 - 5000 = \text{Rs. } 408$$

Why other options are wrong:

- Option A: Rs. 380 would require a rate lower than 4% per period
- Option B: Rs. 400 $= 5000 \times 8\%$ (simple interest for 1 year at 8%, ignoring half-yearly compounding)
- Option D: Rs. 420 overstates the compound interest earned

Final Answer: Compound interest earned $=$ Rs. 408 $\Rightarrow \boxed{C}$

Answer: (C) Go Back to Q14

Q15.

Solution

Quick Solution: Concept: Area of Right-Angled Triangle. **Chapter:** Mensuration 2D. Area $= \frac{1}{2} \times$ base $\times$ height. **Answer:** D.

Concept — Area of Right-Angled Triangle: Area $= \frac{1}{2} \times$ base $\times$ height. For a right triangle, the two legs serve as base and height.

Step 1 — Identify base and height: Base $= 12$ cm; Height $= 9$ cm.

Step 2 — Calculate area:

$$\text{Area} = \frac{1}{2} \times 12 \times 9 = \frac{108}{2} = 54 \text{ cm}^2$$

Why other options are wrong:

- Option A: 40 cm^2 $= \frac{1}{2} \times 8 \times 10$ (wrong leg lengths)
- Option B: 48 cm^2 $= \frac{1}{2} \times 12 \times 8$ (uses 8 cm instead of 9 cm as height)
- Option C: 52 cm^2 does not arise from the formula with legs 9 cm and 12 cm

Final Answer: Area $= 54$ cm^2 $\Rightarrow \boxed{D}$

Answer: (D) Go Back to Q15

Q16.

Solution

Quick Solution: Concept: Total Surface Area of a Cube. **Chapter:** Mensuration 3D. A cube has 6 identical square faces, each of area a^2. **Answer:** A.

Concept — Total Surface Area of a Cube: A cube has 6 identical square faces, each of area a^2. So TSA $= 6a^2$.

Step 1 — Calculate TSA:

$$\text{TSA} = 6 \times (6)^2 = 6 \times 36 = 216 \text{ cm}^2$$

Why other options are wrong:

- Option B: 256 cm^2 $= 6 \times 42.\overline{6}$ — no integer edge length gives this value
- Option C: 196 cm^2 $= 6 \times 32.7$ — would need edge ≈ 5.72 cm, not 6 cm
- Option D: 324 cm^2 $= 6 \times 54$ — would need edge $= \sqrt{54} \approx 7.35$ cm, not 6 cm

Final Answer: Total Surface Area $= 216$ cm^2 $\Rightarrow \boxed{A}$

Answer: (A) Go Back to Q16

Q17.

Solution

Quick Solution: Concept: Area of Annulus (Ring). **Chapter:** Mensuration Combined. Area of circular ring $= \pi(R^2 - r^2)$, where R is outer radius and r is inner radius. **Answer:** B.

Concept — Area of Annulus (Ring): Area of circular ring $= \pi(R^2 - r^2)$, where R is outer radius and r is inner radius.

Step 1 — Identify values: $R = 14$ m, $r = 7$ m, $\pi = \frac{22}{7}$.

Step 2 — Calculate:

$$\text{Area} = \frac{22}{7} \times \left(14^2 - 7^2\right) = \frac{22}{7} \times (196 - 49) = \frac{22}{7} \times 147 = 22 \times 21 = 462 \text{ m}^2$$

Why other options are wrong:

- Option A: 420 m^2 $= \frac{22}{7} \times 133.6$ — 133.6 is not a multiple of 7, so this is not achievable with $\pi = \frac{22}{7}$

- Option C: 480 m^2 and Option D: 500 m^2 both exceed the correct area of 462 m^2

Final Answer: Area of path $= 462\ m^2 \Rightarrow \boxed{B}$

Answer: (B) Go Back to Q17

Q18.

Solution

Quick Solution: Concept: Classical Probability. **Chapter:** Probability. . **Answer:** C.

Concept — Classical Probability:

$$P(\text{event}) = \frac{\text{Number of favourable outcomes}}{\text{Total number of outcomes}}$$

Step 1 — Count Kings in a standard deck: There are 4 Kings — one each of Hearts, Diamonds, Clubs, and Spades.

Step 2 — Calculate probability:

$$P(\text{King}) = \frac{4}{52} = \frac{1}{13}$$

Why other options are wrong:

- Option A: $\frac{1}{52}$ would be the probability of drawing one specific card (e.g., King of Hearts only), not any King
- Option B: $\frac{1}{26} = \frac{2}{52}$ would imply only 2 Kings in the deck
- Option D: $\frac{1}{4}$ would imply 13 Kings — one entire suit of 13 cards — which is incorrect

Final Answer: $P(\text{King}) = \frac{1}{13} \Rightarrow \boxed{C}$

Answer: (C) Go Back to Q18

Q19.

Solution

Quick Solution: Concept: Combinations with Condition. **Chapter:** Combinations. Use complementary counting. **Answer:** D.

Concept — Combinations with Condition: Use complementary counting.

$$\text{(at least 1 woman)} = \text{(total committees)} - \text{(all-men committees)}$$

Step 1 — Total ways to choose 3 from 8 people (5 men + 3 women):

$$\binom{8}{3} = \frac{8 \times 7 \times 6}{3 \times 2 \times 1} = 56$$

Step 2 — All-men committees (choose 3 from 5 men):

$$\binom{5}{3} = \frac{5 \times 4}{2 \times 1} = 10$$

Step 3 — Committees with at least 1 woman:

$$56 - 10 = 46$$

Why other options are wrong:

- Option A: 30 — possible error in computing $\binom{8}{3}$ or $\binom{5}{3}$
- Option B: 36 — double-subtracts or uses incorrect complement
- Option C: 42 $= 56 - 14$ uses the wrong complement count ($\binom{5}{3} = 10$, not 14)

Final Answer: Number of valid committees $= 46 \Rightarrow \boxed{D}$

Answer: (D) Go Back to Q19

Q20.

Solution

Quick Solution: Concept: Class Average. **Chapter:** Averages. Total marks = class average × number of students. **Answer:** A.

Concept — Class Average: Total marks = class average × number of students.

Step 1 — Set up equation: Let class size = n. Total marks = $68n$. Top scorer has 89 marks; remaining $(n-1)$ students have average 65, so their total = $65(n-1)$.

$$68n = 89 + 65(n-1)$$

Step 2 — Solve for n:

$$68n = 89 + 65n - 65 = 65n + 24 \implies 3n = 24 \implies n = 8$$

Verification: Total $= 89 + 65 \times 7 = 89 + 455 = 544 = 68 \times 8$ ✓

Why other options are wrong:

- Option B: $n = 10 \Rightarrow 68 \times 10 = 680$; but $89 + 65 \times 9 = 674 \neq 680$
- Option C: $n = 12 \Rightarrow 816$; but $89 + 65 \times 11 = 804 \neq 816$
- Option D: $n = 15 \Rightarrow 1020$; but $89 + 65 \times 14 = 999 \neq 1020$

Final Answer: Class size = **8** $\Rightarrow \boxed{A}$

Answer: (A) Go Back to Q20

Q21.

Solution

Quick Solution: Concept: Weighted Average. **Chapter:** Averages. . **Answer:** B.

Concept — Weighted Average:

$$\text{Average daily earning} = \frac{\text{Total earnings}}{\text{Total days}}$$

Step 1 — Calculate total earnings:

$$\text{Total} = (200 \times 25) + (50 \times 5) = 5{,}000 + 250 = \text{Rs. } 5{,}250$$

Step 2 — Divide by total days:

$$\text{Average} = \frac{5{,}250}{30} = \text{Rs. } 175$$

Why other options are wrong:

- Option A: Rs. 165 $\Rightarrow$ total would be $165 \times 30 = \text{Rs. } 4{,}950 \neq \text{Rs. } 5{,}250$
- Option C: Rs. 180 $\Rightarrow$ total would be $180 \times 30 = \text{Rs. } 5{,}400 \neq \text{Rs. } 5{,}250$
- Option D: Rs. 185 $\Rightarrow$ total would be $185 \times 30 = \text{Rs. } 5{,}550 \neq \text{Rs. } 5{,}250$

Final Answer: Average daily earning $= \text{Rs. } 175 \Rightarrow \boxed{B}$

Answer: (B) Go Back to Q21

Q22.

Solution

Quick Solution: Concept: Geometric Progression. **Chapter:** Analytical — Series. Each term is obtained by multiplying the previous term by a fixed common ratio r. **Answer:** C.

Concept — Geometric Progression: Each term is obtained by multiplying the previous term by a fixed common ratio r.

Step 1 — Identify the common ratio:

$$\frac{9}{3} = 3, \quad \frac{27}{9} = 3, \quad \frac{81}{27} = 3$$

Common ratio $r = 3$.

Step 2 — Find the next term:

$$81 \times 3 = 243$$

Why other options are wrong:

- Option A: $162 = 81 \times 2$ (would imply common ratio 2, inconsistent with the series)
- Option B: $216 = 6^3$ (has no relation to the common ratio 3 in this series)
- Option D: $324 = 81 \times 4$ (would imply common ratio 4, which does not hold for earlier terms)

Final Answer: Next term $=$ **243** $\Rightarrow \boxed{C}$

Answer: (C) Go Back to Q22

Q23.

Solution

Quick Solution: Concept: Letter Shift Cipher (Caesar Cipher +1). **Chapter:** Coding-Decoding. Each letter is replaced by the letter one position ahead in the alphabet (A→B, B→C, . . . , Y→Z, Z→A). **Answer:** D.

Concept — Letter Shift Cipher (Caesar Cipher +1): Each letter is replaced by the letter one position ahead in the alphabet (A→B, B→C, . . . , Y→Z, Z→A).

Step 1 — Apply the cipher to GRAPE letter by letter:

G	R	A	P	E
$\downarrow +1$	$\downarrow +1$	$\downarrow +1$	$\downarrow +1$	$\downarrow +1$
H	S	B	Q	F

Step 2 — Read the code: GRAPE → **HSBQF**.

Why other options are wrong:

- Option A: HSBQE — last letter E is not shifted; E+1 = F, so it should be F, not E
- Option B: HRAOF — R should shift to S (not remain R), and other letters are also incorrectly shifted
- Option C: GRAQF — first letter G is not shifted; G+1 = H, so it should be H, not G

Final Answer: Code for GRAPE = **HSBQF** $\Rightarrow \boxed{D}$

Answer: (D) Go Back to Q23

Q24.

Solution

Quick Solution: Concept: Blood Relations. **Chapter:** Blood Relations. Trace the relationship chain step by step from the given clues. **Answer:** A.

Concept — Blood Relations: Trace the relationship chain step by step from the given clues.

Step 1 — Identify "my mother's husband": A person's mother's husband is their

father (in a standard family structure).

Step 2 — Identify the person in the photograph: The person is the **son of Ravi's father**.

Step 3 — Conclude the relationship: Father's son = Ravi's **brother** (another son of the same father).

Why other options are wrong:

- Option B: Father — the photo shows the *son* of Ravi's father, not the father himself
- Option C: Son — Ravi is not a parent of the person in the photograph
- Option D: Cousin — cousins are children of one's aunt or uncle, not one's father

Final Answer: The person in the photograph is Ravi's **Brother** $\Rightarrow \boxed{A}$

Answer: (A) Go Back to Q24

Q25.

Solution

Quick Solution: Concept: Circular Permutations. **Chapter:** Direction Sense. The number of ways to arrange n distinct objects in a circle is $(n-1)!$, because one position is fixed to eliminate rotational duplicates. **Answer:** B.

Concept — Circular Permutations: The number of ways to arrange n distinct objects in a circle is $(n-1)!$, because one position is fixed to eliminate rotational duplicates.

Step 1 — Apply formula with $n = 4$:

$$\text{Circular arrangements} = (4-1)! = 3! = 3 \times 2 \times 1 = 6$$

Why other options are wrong:

- Option A: $24 = 4!$ counts *linear* (row) arrangements; each distinct circular arrangement is counted 4 times in $4!$, so divide by 4 to get $24/4 = 6$
- Option C: $12 = 4!/2$ applies only for *necklace* arrangements (where clockwise and anticlockwise are treated as identical), which is not the case for seated people
- Option D: 16 does not correspond to any standard permutation formula for $n = 4$

Final Answer: Distinct circular seating arrangements $= 6 \Rightarrow \boxed{B}$

Answer: (B) Go Back to Q25

Answer Key

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