IBSAT Quantitative Aptitude

Sample Paper – 10

Duration: 26 Minutes **Maximum Marks: 30**

Instructions

- This paper contains **30** Multiple Choice Questions (Single Correct Answer), modelled on the Quantitative Aptitude section of **IBSAT** (ICFAI Business School Aptitude Test).
- Each correct answer carries **+1 mark**. There is **no negative marking** for incorrect or unattempted answers, so attempt every question.
- Only **one** option is correct. Choose the most appropriate answer.
- IBSAT is a computer-based test with no sectional time limit; attempt this practice paper in one timed sitting of about **26 minutes**.
- Use of mobile phones, calculators, log tables, or electronic gadgets is strictly prohibited.

Part A: Arithmetic

Q1. Rohan's monthly budget is Rs. 40000. He spends 35% of it on rent. How much does he spend on rent each month?

(A) Rs. 12000

(B) Rs. 14000

(C) Rs. 15000

(D) Rs. 16000

Q2. A trader buys one item for Rs. 600 and sells it at a 20% profit, and buys another for Rs. 900 and sells it at a 10% profit. What is the overall profit percent on the two items together?

(A) 12%

(B) 13%

(C) 14%

(D) 15%

Q3. 60 chocolates are divided among three children in the ratio 2 : 3 : 5. How many chocolates does the child with the largest share receive?

(A) 30

(B) 18

(C) 12

(D) 24

Q4. The average age of 8 students is 15 years. A student aged 12 years leaves and is replaced by a new student, after which the average age becomes 16 years. What is the age of the new student?

(A) 18 years

(B) 22 years

(C) 24 years

(D) 20 years

Q5. In how many years will a sum of Rs. 6000 earn a simple interest of Rs. 1800 at the rate of 5% per annum?

(A) 5 years

(B) 6 years

(C) 4 years

(D) 8 years

Q6. Find the amount on Rs. 12000 at 10% per annum for 2 years, compounded annually.

(A) Rs. 14520

(B) Rs. 14400

(C) Rs. 13200

(D) Rs. 14200

Q7. A vessel contains 40 litres of pure milk. 8 litres are drawn out and replaced by water; then again 8 litres of the mixture are drawn out and replaced by water. How many litres of milk remain in the vessel?

(A) 24 litres

(B) 26 litres

(C) 25.6 litres

(D) 28 litres

Q8. A starts a business with Rs. 8000. After 3 months, B joins with Rs. 12000. At the end of the year the total profit is Rs. 3400. What is B's share of the profit?

(A) Rs. 1600

(B) Rs. 1700

(C) Rs. 2000

(D) Rs. 1800

Q9. The price of an article is Rs. 500. It is first decreased by 10% and then increased by 20%. What is the final price?

(A) Rs. 520

(B) Rs. 540

(C) Rs. 550

(D) Rs. 560

Q10. A machine worth Rs. 20000 depreciates at 10% of its value every year. What is its value after 2 years?

(A) Rs. 16200

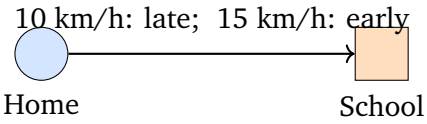
(B) Rs. 16000

(C) Rs. 16400

(D) Rs. 18000

Part B: Speed, Time and Work

Q11. A boy walks from home to school. If he walks at 10 km/h he reaches 5 minutes late, and if he walks at 15 km/h he reaches 5 minutes early. At what speed must he walk to reach the school exactly on time?



(A) 10 km/h

(B) 15 km/h

(C) 12 km/h

(D) 14 km/h

Q12. A boat covers 12 km downstream in 2 hours and 12 km upstream in 3 hours. What is the speed of the boat in still water?

(A) 4.5 km/h

(B) 5.5 km/h

(C) 4 km/h

(D) 5 km/h

Q13. A can complete a piece of work in 10 days and B can complete the same work in 15 days. They work together and finish it, earning a total of Rs. 500. What is A's share of the wages?

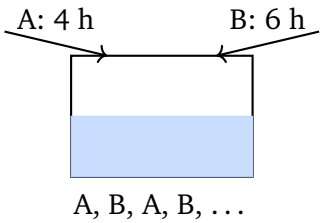
(A) Rs. 300

(B) Rs. 200

(C) Rs. 250

(D) Rs. 350

Q14. Pipe A can fill a tank in 4 hours and pipe B can fill it in 6 hours. Starting with A, the two pipes are opened alternately for one hour each. In how many hours will the tank be full?



(A) 5 hours

(B) $4\frac{2}{3}$ hours

(C) $4\frac{1}{2}$ hours

(D) $5\frac{1}{3}$ hours

Part C: Number System

Q15. What is the remainder when 2^{10} is divided by 7?

(A) 1

(B) 3

(C) 2

(D) 4

Q16. Two numbers are in the ratio 3 : 4 and their LCM is 240. What is their HCF?

(A) 12

(B) 16

(C) 24

(D) 20

Q17. What is the unit digit of 5^{23}?

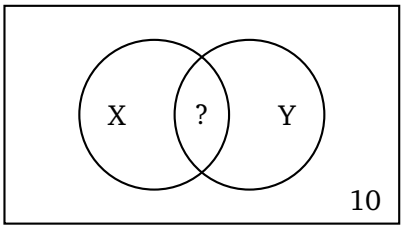
(A) 5

(B) 0

(C) 1

(D) 6

Q18. In a survey of 80 people, 45 use product X, 50 use product Y, and 10 use neither product. How many people use both products?



(A) 20

(B) 25

(C) 15

(D) 30

Part D: Algebra

Q19. The sum of the present ages of a father and his son is 45 years. Five years ago, the father was 6 times as old as his son. What is the son's present age?

(A) 7 years

(B) 8 years

(C) 12 years

(D) 10 years

Q20. One root of the equation $x^2 - bx + 1 = 0$ is 3. What is the other root?

(A) 3

(B) -3

(C) $\frac{1}{3}$

(D) $-\frac{1}{3}$

Q21. For how many positive integer values of x is the inequality $2x - 1 < 9$ satisfied?

(A) 4

(B) 5

(C) 3

(D) 6

Q22. What is the arithmetic mean inserted between the numbers 12 and 30?

(A) 18

(B) 21

(C) 20

(D) 24

Q23. In a geometric progression, the 2nd term is 6 and the 5th term is 48. What is the common ratio?

(A) 3

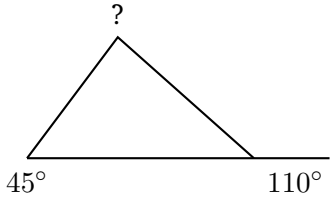
(B) 4

(C) 1.5

(D) 2

Part E: Geometry and Mensuration

Q24. In the triangle shown, the exterior angle at one vertex is 110° and one of the two remote interior angles is 45°. What is the other remote interior angle?



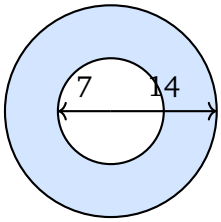
(A) 55°

(B) 70°

(C) 65°

(D) 60°

Q25. Two concentric circles have radii 7 cm and 14 cm. What is the area of the ring (shaded region) between them? (Take $\pi = \frac{22}{7}$.)



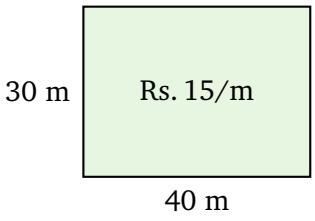
(A) 462 cm^2

(B) 440 cm^2

(C) 480 cm^2

(D) 450 cm^2

Q26. A rectangular field is 40 m long and 30 m wide. What is the cost of fencing it at Rs. 15 per metre?



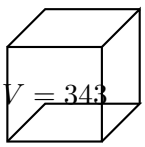
(A) Rs. 2000

(B) Rs. 2100

(C) Rs. 2400

(D) Rs. 1900

Q27. The volume of a cube is 343 cm^3. What is the length of its edge?



(A) 6 cm

(B) 8 cm

(C) 9 cm

(D) 7 cm

Part F: Permutation, Combination and Probability

Q28. In how many different ways can the letters of the word "RADAR" be arranged?

(A) 60

(B) 20

(C) 30

(D) 120

Q29. A bag contains 6 red balls and 4 blue balls. In how many ways can 3 red balls be selected from the bag?

(A) 20

(B) 15

(C) 10

(D) 18

Q30. A spinner is divided into 8 equal sectors numbered 1 to 8. When it is spun once, what is the probability that it lands on a number greater than 5?

(A) $\frac{1}{8}$

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

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

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

Detailed Solutions

Q1.

Solution

Concept — Percentage: A percentage of a quantity is found by multiplying the quantity by the percentage written as a fraction of 100.

Step 1 — Write the rent percentage as a fraction:

$$35\% = \frac{35}{100}.$$

Step 2 — Multiply by the monthly budget:

$$\frac{35}{100} \times 40000.$$

Step 3 — Simplify:

$$35 \times 400 = 14000.$$

Why other options are wrong:

- Option A: Rs. 12000 uses 30% instead of 35%.
- Option C: Rs. 15000 uses 37.5%.
- Option D: Rs. 16000 uses 40%.

Final Answer: Rent $= \frac{35}{100} \times 40000 =$ Rs. 14000 $\Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q1

Q2.

Solution

Concept — Overall Profit Percent: Find the total cost and total selling price of both items, then apply profit% $= \dfrac{\text{total SP} - \text{total CP}}{\text{total CP}} \times 100$.

Step 1 — Selling price of the first item:

$$600 \times \left(1 + \frac{20}{100}\right) = 600 \times 1.2 = 720.$$

Step 2 — Selling price of the second item:

$$900 \times \left(1 + \frac{10}{100}\right) = 900 \times 1.1 = 990.$$

Step 3 — Total cost and total selling price:

$$\text{CP} = 600 + 900 = 1500, \qquad \text{SP} = 720 + 990 = 1710.$$

Step 4 — Overall profit percent:

$$\frac{1710 - 1500}{1500} \times 100 = \frac{210}{1500} \times 100 = 14\%.$$

Why other options are wrong:

- Option A: 12% averages the rates on equal amounts, ignoring unequal costs.
- Option B: 13% has no valid basis here.
- Option D: 15% is the simple average of 20% and 10%.

Final Answer: Overall profit $= \frac{210}{1500} \times 100 = 14\% \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q2

Q3.

Solution

Concept — Ratio and Proportion: Split a quantity in a given ratio by finding the value of one part, then multiplying by the required number of parts.

Step 1 — Total number of parts:

$$2 + 3 + 5 = 10.$$

Step 2 — Value of one part:

$$\frac{60}{10} = 6.$$

Step 3 — Largest share has 5 parts:

$$5 \times 6 = 30.$$

Why other options are wrong:

- Option B: 18 is the middle share (3 parts), not the largest.
- Option C: 12 is the smallest share (2 parts).
- Option D: 24 does not match any whole number of parts here.

Final Answer: Largest share $= 5 \times 6 = 30$ chocolates $\Rightarrow$ A

Answer: (A) Go Back to Q3

Q4.

Solution

Concept — Change in Average: Replacing one member changes the total by the difference of the two members; the new member = old member + (rise in average $\times$ count).

Step 1 — Total rise needed in the sum of ages:

$$8 \times (16 - 15) = 8 \times 1 = 8.$$

Step 2 — The leaving student's age:

$$12 \text{ years.}$$

Step 3 — Age of the new student:

$$12 + 8 = 20 \text{ years.}$$

Why other options are wrong:

- Option A: 18 adds a rise of only 6 to the sum.
- Option B: 22 adds too large a rise.
- Option C: 24 doubles the required increase.

Final Answer: New student's age $= 12 + 8 = 20$ years $\Rightarrow$ D

Answer: (D) Go Back to Q4

Q5.

Solution

Concept — Simple Interest: From $\text{SI} = \dfrac{P \times R \times T}{100}$, the time is $T = \dfrac{\text{SI} \times 100}{P \times R}$.

Step 1 — Substitute the known values:

$$T = \frac{1800 \times 100}{6000 \times 5}.$$

Step 2 — Multiply the numerator and denominator:

$$T = \frac{180000}{30000}.$$

Step 3 — Divide:

$$T = 6 \text{ years}.$$

Why other options are wrong:

- Option A: 5 years gives interest of only Rs. 1500.
- Option C: 4 years gives Rs. 1200.
- Option D: 8 years gives Rs. 2400.

Final Answer: Time $= \frac{1800\times100}{6000\times5} = 6$ years $\Rightarrow$ B

Answer: (B) Go Back to Q5

Q6.

Solution

Concept — Compound Interest: The amount after T years is $A = P\left(1 + \dfrac{R}{100}\right)^T$.

Step 1 — Write the growth factor:

$$1 + \frac{10}{100} = 1.1.$$

Step 2 — Raise it to the power of the time:

$$(1.1)^2 = 1.21.$$

Step 3 — Multiply by the principal:

$$12000 \times 1.21 = 14520.$$

Why other options are wrong:

- Option B: Rs. 14400 uses a flat 20% without compounding.
- Option C: Rs. 13200 adds only one year's interest.
- Option D: Rs. 14200 has no valid basis here.

Final Answer: Amount $= 12000 \times 1.21 =$ Rs. 14520 $\Rightarrow$ A

Answer: (A) Go Back to Q6

Q7.

Solution

Concept — Repeated Replacement: If a fraction is removed and replaced by water n times, the milk left $=$ initial $\times \left(1 - \dfrac{\text{drawn}}{\text{total}}\right)^n$.

Step 1 — Fraction drawn each time:

$$\frac{8}{40} = \frac{1}{5}.$$

Step 2 — Fraction of milk left after each draw:

$$1 - \frac{1}{5} = \frac{4}{5}.$$

Step 3 — Apply it twice:

$$40 \times \left(\frac{4}{5}\right)^2 = 40 \times \frac{16}{25}.$$

Step 4 — Compute:

$$40 \times \frac{16}{25} = \frac{640}{25} = 25.6 \text{ litres}.$$

Why other options are wrong:

- Option A: 24 litres subtracts 8 litres of milk twice, ignoring the dilution.
- Option B: 26 litres has no valid basis here.
- Option D: 28 litres applies the replacement only once.

Final Answer: Milk left $= 40 \times \left(\frac{4}{5}\right)^2 = 25.6$ litres $\Rightarrow$ C

Answer: (C) Go Back to Q7

Q8.

Solution

Concept — Partnership (Capital $\times$ Time): When partners invest for different periods, profit is shared in the ratio of (capital $\times$ months).

Step 1 — A's capital-months (full 12 months):

$$8000 \times 12 = 96000.$$

Step 2 — B's capital-months (joins after 3 months, so 9 months):

$$12000 \times 9 = 108000.$$

Step 3 — Ratio of shares:

$$96000 : 108000 = 8 : 9.$$

Step 4 — B's share of the profit:

$$\frac{9}{8+9} \times 3400 = \frac{9}{17} \times 3400 = 9 \times 200 = 1800.$$

Why other options are wrong:

- Option A: Rs. 1600 is A's share, not B's.
- Option B: Rs. 1700 splits the profit equally.
- Option C: Rs. 2000 ignores that B joined late.

Final Answer: B's share $= \frac{9}{17} \times 3400 =$ Rs. 1800 $\Rightarrow$ D

Answer: (D) Go Back to Q8

Q9.

Solution

Concept — Successive Percentage Change: Apply each change as a multiplying factor to the running value, one after the other.

Step 1 — Apply the 10% decrease:

$$500 \times \left(1 - \frac{10}{100}\right) = 500 \times 0.9 = 450.$$

Step 2 — Apply the 20% increase on the new value:

$$450 \times \left(1 + \frac{20}{100}\right) = 450 \times 1.2.$$

Step 3 — Compute:

$$450 \times 1.2 = 540.$$

Why other options are wrong:

- Option A: Rs. 520 applies the two changes to the same base of 500.
- Option C: Rs. 550 adds a flat 10% net change.
- Option D: Rs. 560 overstates the increase.

Final Answer: Final price $= 500 \times 0.9 \times 1.2 =$ Rs. 540 $\Rightarrow$ B

Answer: (B) Go Back to Q9

Q10.

Solution

Concept — Compound Depreciation: A value falling at a fixed rate each year follows $V = P\left(1 - \frac{R}{100}\right)^T$.

Step 1 — Write the yearly decay factor:

$$1 - \frac{10}{100} = 0.9.$$

Step 2 — Raise it to the power of the time:

$$(0.9)^2 = 0.81.$$

Step 3 — Multiply by the original value:

$$20000 \times 0.81 = 16200.$$

Why other options are wrong:

- Option B: Rs. 16000 subtracts a flat 20% without compounding.
- Option C: Rs. 16400 has no valid basis here.
- Option D: Rs. 18000 depreciates for only one year.

Final Answer: Value after 2 years $= 20000 \times 0.81 =$ Rs. 16200 $\Rightarrow$ A

Answer: (A) Go Back to Q10

Q11.

Solution

Concept — Time, Speed and Distance: The difference between being late and early gives the time gap; use it to find the distance, then the on-time speed.

Step 1 — Total time gap between the two walks:

$$5 \text{ min late} + 5 \text{ min early} = 10 \text{ min} = \frac{10}{60} = \frac{1}{6} \text{ hour}.$$

Step 2 — Set up the distance equation:

$$\frac{D}{10} - \frac{D}{15} = \frac{1}{6}.$$

Step 3 — Simplify the left side:

$$D\left(\frac{3-2}{30}\right) = \frac{D}{30} = \frac{1}{6}.$$

Step 4 — Solve for the distance:

$$D = \frac{30}{6} = 5 \text{ km}.$$

Step 5 — Find the on-time schedule (walk at 10 km/h takes 30 min, but is 5 min late):

$$\text{Scheduled time} = 30 - 5 = 25 \text{ min} = \frac{25}{60} = \frac{5}{12} \text{ hour}.$$

Step 6 — Required speed to arrive on time:

$$\frac{5}{5/12} = 5 \times \frac{12}{5} = 12 \text{ km/h}.$$

Why other options are wrong:

- Option A: 10 km/h makes him 5 minutes late.
- Option B: 15 km/h makes him 5 minutes early.
- Option D: 14 km/h makes him reach before time.

Final Answer: Required speed $= \frac{5}{5/12} = 12$ km/h $\Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q11

Q12.

Solution

Concept — Boats and Streams: Still-water speed $= \dfrac{\text{downstream speed} + \text{upstream speed}}{2}$.

Step 1 — Downstream speed:

$$\frac{12}{2} = 6 \text{ km/h}.$$

Step 2 — Upstream speed:

$$\frac{12}{3} = 4 \text{ km/h}.$$

Step 3 — Still-water speed is the average of the two:

$$\frac{6+4}{2} = \frac{10}{2} = 5 \text{ km/h}.$$

Why other options are wrong:

- Option A: 4.5 km/h averages incorrectly.
- Option B: 5.5 km/h has no valid basis here.
- Option C: 4 km/h is the upstream speed, not the still-water speed.

Final Answer: Still-water speed $= \frac{6+4}{2} = 5$ km/h $\Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q12

Q13.

Solution

Concept — Wages in Proportion to Work: When people work together, wages are shared in the ratio of the work each does, which equals the ratio of their one-day rates.

Step 1 — One-day work of each:

$$A = \frac{1}{10}, \qquad B = \frac{1}{15}.$$

Step 2 — Ratio of their work:

$$\frac{1}{10} : \frac{1}{15} = \frac{3}{30} : \frac{2}{30} = 3 : 2.$$

Step 3 — A's share is 3 of the 5 parts:

$$\frac{3}{5} \times 500 = 300.$$

Why other options are wrong:

- Option B: Rs. 200 is B's share, not A's.
- Option C: Rs. 250 splits the wages equally.
- Option D: Rs. 350 exceeds A's correct three-fifths share.

Final Answer: A's wages $= \frac{3}{5} \times 500 =$ Rs. 300 $\Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q13

Q14.

Solution

Concept — Pipes Opened Alternately: Add the work done in each one-hour turn until the tank is full; the last turn may be only partly needed.

Step 1 — Work done per hour by each pipe:

$$A = \frac{1}{4}, \qquad B = \frac{1}{6}.$$

Step 2 — Work done in one full A–B cycle (2 hours):

$$\frac{1}{4}+\frac{1}{6}=\frac{3}{12}+\frac{2}{12}=\frac{5}{12}.$$

Step 3 — After two cycles (4 hours):

$$2\times\frac{5}{12}=\frac{10}{12}=\frac{5}{6}.$$

Step 4 — Remaining part of the tank:

$$1-\frac{5}{6}=\frac{1}{6}.$$

Step 5 — The 5th hour is A's turn; time A needs for the remaining $\frac{1}{6}$:

$$\frac{1/6}{1/4}=\frac{1}{6}\times 4=\frac{2}{3}\text{ hour}.$$

Step 6 — Total time:

$$4+\frac{2}{3}=4\tfrac{2}{3}\text{ hours}.$$

Why other options are wrong:

- Option A: 5 hours overfills the tank.
- Option C: $4\frac{1}{2}$ hours understates the last partial turn.
- Option D: $5\frac{1}{3}$ hours adds an extra full turn.

Final Answer: Tank is full in $4\frac{2}{3}$ hours $\Rightarrow$ B

Answer: (B) Go Back to Q14

Q15.

Solution

Concept — Remainders (Divisibility Shortcut): Find a small power of the base that leaves remainder 1, then break the exponent around it.

Step 1 — Note a useful power of 2 modulo 7:

$$2^3=8\equiv 1 \pmod 7.$$

Step 2 — Write the exponent 10 using multiples of 3:

$$2^{10} = 2^9 \times 2^1 = (2^3)^3 \times 2.$$

Step 3 — Replace 2^3 by 1 modulo 7:

$$(1)^3 \times 2 = 2 \pmod 7.$$

Why other options are wrong:

- Option A: 1 is the remainder of 2^9, not 2^{10}.
- Option B: 3 has no basis in this cycle.
- Option D: 4 is the remainder of 2^{11}.

Final Answer: $2^{10} \equiv 2 \pmod 7 \Rightarrow \boxed{C}$

Answer: (C) Go Back to Q15

Q16.

Solution

Concept — HCF from a Ratio: If two numbers are in ratio $a : b$ with a, b coprime, they are ax and bx where x is their HCF, and their LCM is abx.

Step 1 — Write the numbers using the HCF x:

$$3x \text{ and } 4x, \text{ where } \gcd(3, 4) = 1.$$

Step 2 — Express the LCM:

$$\text{LCM} = 3 \times 4 \times x = 12x.$$

Step 3 — Set the LCM equal to 240 and solve:

$$12x = 240 \Rightarrow x = 20.$$

Why other options are wrong:

- Option A: 12 would make the LCM 144, not 240.
- Option B: 16 would make the LCM 192.
- Option C: 24 would make the LCM 288.

Final Answer: HCF $= \frac{240}{12} = 20 \Rightarrow$ D

Answer: (D) Go Back to Q16

Q17.

Solution

Concept — Unit Digit of Powers of 5: Every positive integer power of 5 ends in the digit 5.

Step 1 — Check the first few powers of 5:

$$5^1 = 5, \quad 5^2 = 25, \quad 5^3 = 125.$$

Step 2 — The unit digit stays 5 for every power:

$$\text{Unit digit of } 5^{23} = 5.$$

Why other options are wrong:

- Option B: 0 is the unit digit of powers of 10, not 5.
- Option C: 1 never occurs as a unit digit of a power of 5.
- Option D: 6 is the unit digit of powers of 6, not 5.

Final Answer: The unit digit of 5^{23} is 5 $\Rightarrow$ A

Answer: (A) Go Back to Q17

Q18.

Solution

Concept — Sets (Inclusion–Exclusion): $n(X \cup Y) = n(X) + n(Y) - n(X \cap Y)$, so $n(X \cap Y) = n(X) + n(Y) - n(X \cup Y)$.

Step 1 — People who use at least one product:

$$80 - 10 = 70.$$

Step 2 — Apply the inclusion–exclusion rule for both:

$$n(X \cap Y) = 45 + 50 - 70.$$

Step 3 — Compute:

$$45 + 50 - 70 = 25.$$

Why other options are wrong:

- Option A: 20 forgets to subtract the 10 who use neither.
- Option C: 15 understates the overlap.
- Option D: 30 adds instead of subtracting somewhere.

Final Answer: Both products $= 45 + 50 - 70 = 25$ people $\Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q18

Q19.

Solution

Concept — Present Ages: Set up variables for the present ages, use the total, and translate the "years ago" condition into an equation.

Step 1 — Let the son's present age be s; then the father's is $45 - s$.

Step 2 — Write the condition for five years ago:

$$(45 - s) - 5 = 6\,(s - 5).$$

Step 3 — Simplify both sides:

$$40 - s = 6s - 30.$$

Step 4 — Collect the terms:

$$40 + 30 = 6s + s \;\Rightarrow\; 70 = 7s.$$

Step 5 — Solve for the son's age:

$$s = 10 \text{ years}.$$

Why other options are wrong:

- Option A: 7 years does not satisfy the "6 times" condition.
- Option B: 8 years gives a father who is not 6 times as old.
- Option C: 12 years makes the father only 33, breaking the ratio.

Final Answer: The son's present age is 10 years $\Rightarrow$ D

Answer: (D) Go Back to Q19

Q20.

Solution

Concept — Product of Roots: For $x^2 - bx + c = 0$, the product of the roots is c. Here $c = 1$, so the roots are reciprocals of each other.

Step 1 — Write the product of the roots:

$$\text{root}_1 \times \text{root}_2 = 1.$$

Step 2 — One root is given as 3:

$$3 \times \text{root}_2 = 1.$$

Step 3 — Solve for the other root:

$$\text{root}_2 = \frac{1}{3}.$$

Why other options are wrong:

- Option A: 3 would make the product 9, not 1.
- Option B: -3 gives a product of -9.
- Option D: $-\frac{1}{3}$ gives a product of -1.

Final Answer: The other root is $\frac{1}{3} \Rightarrow$ C

Answer: (C) Go Back to Q20

Q21.

Solution

Concept — Linear Inequalities: Solve the inequality for x, then count the positive integers that satisfy it.

Step 1 — Add 1 to both sides:

$$2x < 10.$$

Step 2 — Divide both sides by 2:

$$x < 5.$$

Step 3 — List the positive integers below 5:

$$x = 1, 2, 3, 4 \;\Rightarrow\; 4 \text{ values.}$$

Why other options are wrong:

- Option B: 5 wrongly includes $x = 5$, which gives $2x - 1 = 9$, not less than 9.
- Option C: 3 misses $x = 4$.
- Option D: 6 counts values that do not satisfy the inequality.

Final Answer: There are 4 positive integers (1 to 4) $\Rightarrow$ A

Answer: (A) Go Back to Q21

Q22.

Solution

Concept — Arithmetic Mean: The single arithmetic mean between two numbers a and b is $\dfrac{a+b}{2}$, so that a, the mean, and b form an arithmetic progression.

Step 1 — Add the two numbers:

$$12 + 30 = 42.$$

Step 2 — Divide by 2:

$$\frac{42}{2} = 21.$$

Step 3 — Check the progression:

$$12,\ 21,\ 30 \text{ has a common difference of } 9.$$

Why other options are wrong:

- Option A: 18 does not sit halfway between 12 and 30.
- Option C: 20 gives unequal gaps of 8 and 10.
- Option D: 24 gives unequal gaps of 12 and 6.

Final Answer: Arithmetic mean $= \frac{12+30}{2} = 21 \Rightarrow$ B

Answer: (B) Go Back to Q22

Q23.

Solution

Concept — Geometric Progression: The nth term is $a_n = a\,r^{n-1}$; dividing two terms cancels a and isolates a power of the common ratio r.

Step 1 — Write the two given terms:

$$ar = 6, \qquad ar^4 = 48.$$

Step 2 — Divide the second by the first:

$$\frac{ar^4}{ar} = \frac{48}{6} \;\Rightarrow\; r^3 = 8.$$

Step 3 — Take the cube root:

$$r = \sqrt[3]{8} = 2.$$

Why other options are wrong:

- Option A: 3 gives $r^3 = 27$, not 8.
- Option B: 4 gives $r^3 = 64$.
- Option C: 1.5 gives $r^3 = 3.375$.

Final Answer: Common ratio $= \sqrt[3]{8} = 2 \Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q23

Q24.

Solution

Concept — Exterior Angle Property: An exterior angle of a triangle equals the sum of the two remote (non-adjacent) interior angles.

Step 1 — Write the exterior-angle relation:

$$110^\circ = 45^\circ + (\text{other remote angle}).$$

Step 2 — Solve for the other angle:

$$\text{other angle} = 110^\circ - 45^\circ.$$

Step 3 — Compute:

$$110^\circ - 45^\circ = 65^\circ.$$

Why other options are wrong:

- Option A: 55° subtracts the wrong angle.
- Option B: 70° has no valid basis here.
- Option D: 60° does not add up with 45° to 110°.

Final Answer: Other remote angle $= 110^\circ - 45^\circ = 65^\circ \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q24

Q25.

Solution

Concept — Area of a Ring: The area between two concentric circles $= \pi\,(R^2 - r^2)$, where R and r are the outer and inner radii.

Step 1 — Square the two radii:

$$R^2 = 14^2 = 196, \qquad r^2 = 7^2 = 49.$$

Step 2 — Subtract to get the difference of squares:

$$196 - 49 = 147.$$

Step 3 — Multiply by $\pi = \frac{22}{7}$:

$$\frac{22}{7} \times 147 = 22 \times 21.$$

Step 4 — Compute:

$$22 \times 21 = 462 \text{ cm}^2.$$

Why other options are wrong:

- Option B: 440 cm^2 has no valid basis here.

- Option C: 480 cm^2 uses the wrong radii.
- Option D: 450 cm^2 rounds incorrectly.

Final Answer: Ring area $= \frac{22}{7}(196 - 49) = 462$ $\text{cm}^2 \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q25

Q26.

Solution

Concept — Cost of Fencing: Fencing runs along the perimeter, so cost = perimeter $\times$ rate per metre.

Step 1 — Find the perimeter of the field:

$$2 \times (40 + 30) = 2 \times 70 = 140 \text{ m}.$$

Step 2 — Multiply by the rate per metre:

$$140 \times 15.$$

Step 3 — Compute:

$$140 \times 15 = 2100.$$

Why other options are wrong:

- Option A: Rs. 2000 rounds the perimeter down.
- Option C: Rs. 2400 uses a perimeter of 160 m.
- Option D: Rs. 1900 understates the perimeter.

Final Answer: Cost $= 140 \times 15 =$ Rs. 2100 $\Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q26

Q27.

Solution

Concept — Edge from Volume: For a cube, volume $=$ edge^3, so the edge $= \sqrt[3]{\text{volume}}$.

Step 1 — Write the relation:

$$\text{edge}^3 = 343.$$

Step 2 — Take the cube root of 343:

$$\text{edge} = \sqrt[3]{343}.$$

Step 3 — Recognise the perfect cube:

$$7 \times 7 \times 7 = 343 \;\Rightarrow\; \text{edge} = 7 \text{ cm}.$$

Why other options are wrong:

- Option A: 6 cm gives a volume of 216 cm^3.
- Option B: 8 cm gives 512 cm^3.
- Option C: 9 cm gives 729 cm^3.

Final Answer: Edge $= \sqrt[3]{343} = 7$ cm $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q27

Q28.

Solution

Concept — Permutations with Repetition: The number of arrangements of n letters, where one letter repeats p times and another q times, is $\dfrac{n!}{p!\,q!}$.

Step 1 — Count the letters of "RADAR":

$$\text{R, A, D, A, R} \;\Rightarrow\; n = 5, \text{ with R twice and A twice.}$$

Step 2 — Write the formula:

$$\frac{5!}{2!\,2!}.$$

Step 3 — Substitute the factorials:

$$\frac{120}{2 \times 2} = \frac{120}{4}.$$

Step 4 — Compute:

$$\frac{120}{4} = 30.$$

Why other options are wrong:

- Option A: 60 divides by only one repeated pair.
- Option B: 20 over-divides the count.
- Option D: 120 treats all five letters as distinct.

Final Answer: Arrangements $= \frac{5!}{2!\,2!} = 30 \Rightarrow$ C

Answer: (C) Go Back to Q28

Q29.

Solution

Concept — Combinations: The number of ways to choose r objects from n, where order does not matter, is $\binom{n}{r} = \frac{n!}{r!\,(n-r)!}$.

Step 1 — Choose 3 red balls from the 6 red balls:

$$\binom{6}{3} = \frac{6!}{3!\,3!}.$$

Step 2 — Simplify using $\frac{6 \times 5 \times 4}{3 \times 2 \times 1}$:

$$\frac{6 \times 5 \times 4}{3 \times 2 \times 1} = \frac{120}{6}.$$

Step 3 — Compute:

$$\frac{120}{6} = 20.$$

Why other options are wrong:

- Option B: 15 comes from $\binom{6}{2}$, choosing 2 balls.
- Option C: 10 comes from $\binom{5}{3}$, using the wrong count.
- Option D: 18 has no valid basis here.

Final Answer: Number of ways $= \binom{6}{3} = 20 \Rightarrow$ A

Answer: (A) Go Back to Q29

Q30.

Solution

Concept — Probability: Probability $= \dfrac{\text{favourable outcomes}}{\text{total outcomes}}$ for equally likely results.

Step 1 — Total outcomes on the spinner:

$$\{1, 2, 3, 4, 5, 6, 7, 8\} \Rightarrow 8 \text{ outcomes.}$$

Step 2 — Favourable outcomes (greater than 5):

$$\{6, 7, 8\} \Rightarrow 3 \text{ outcomes.}$$

Step 3 — Form the probability:

$$\frac{3}{8}.$$

Why other options are wrong:

- Option A: $\frac{1}{8}$ counts only one favourable sector.
- Option B: $\frac{1}{2}$ counts four favourable sectors.
- Option C: $\frac{5}{8}$ counts the numbers 5 or less by mistake.

Final Answer: $P(\text{number} > 5) = \frac{3}{8} \Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q30

Answer Key

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