IBSAT Quantitative Aptitude

Sample Paper – 7

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. The marked price of a jacket is Rs. 800 and it is sold for Rs. 680. What is the discount percent offered?

(A) 12%

(B) 20%

(C) 15%

(D) 10%

Q2. A trader buys a chair for Rs. 1200. At what price should he sell it to earn a profit of 25%?

(A) Rs. 1500

(B) Rs. 1450

(C) Rs. 1400

(D) Rs. 1520

Q3. A 40-litre mixture contains milk and water in the ratio 5 : 3. How many litres of water does it contain?

(A) 12

(B) 15

(C) 25

(D) 18

Q4. The average of 20 numbers was calculated as 35. Later it was found that one number was read as 25 instead of the correct value 45. What is the correct average?

(A) 33

(B) 34

(C) 35

(D) 36

Q5. Find the simple interest on Rs. 7200 at 5% per annum for a period of 8 months.

(A) Rs. 240

(B) Rs. 250

(C) Rs. 300

(D) Rs. 200

Q6. Find the compound interest on Rs. 8000 at 5% per annum for 2 years, compounded annually.

(A) Rs. 800

(B) Rs. 810

(C) Rs. 820

(D) Rs. 840

Q7. In what ratio must tea costing Rs. 18 per kg be mixed with tea costing Rs. 24 per kg so that the blend costs Rs. 20 per kg?

(A) 1 : 2

(B) 2 : 1

(C) 3 : 1

(D) 1 : 1

Q8. A invests Rs. 5000 for 12 months and B invests Rs. 6000 for 8 months in a business. If the total profit is Rs. 4500, what is A's share of the profit?

(A) Rs. 2000

(B) Rs. 2250

(C) Rs. 2400

(D) Rs. 2500

Q9. The price of an article is first increased by 25% and then decreased by 10%. What is the net change in the price?

(A) 15% increase

(B) 10% increase

(C) 12.5% increase

(D) 12.5% decrease

Q10. A machine depreciates in value by 10% every year. If its value after 2 years is Rs. 8100, what was its original value?

(A) Rs. 10000

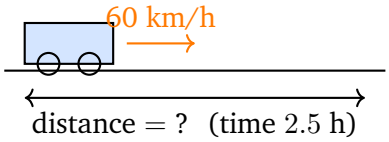
(B) Rs. 9000

(C) Rs. 10500

(D) Rs. 11000

Part B: Speed, Time and Work

Q11. A car travels at a uniform speed of 60 km/h for 2.5 hours. What total distance does it cover?



(A) 120 km

(B) 150 km

(C) 24 km

(D) 180 km

Q12. The downstream speed of a boat is 15 km/h and its upstream speed is 9 km/h. What is the speed of the boat in still water?

(A) 3 km/h

(B) 6 km/h

(C) 9 km/h

(D) 12 km/h

Q13. A can complete a piece of work in 15 days. If he works alone for 6 days, what fraction of the work is still left?

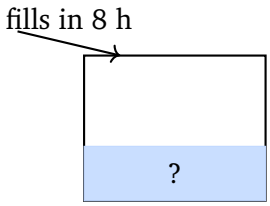
(A) $\frac{3}{5}$

(B) $\frac{2}{5}$

(C) $\frac{1}{5}$

(D) $\frac{2}{3}$

Q14. A pipe can fill a cistern completely in 8 hours. If the pipe is kept open for 3 hours, what fraction of the cistern is filled?



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

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

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

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

Part C: Number System

Q15. What is the remainder when 2^{50} is divided by 7?

(A) 1

(B) 2

(C) 3

(D) 4

Q16. What is the HCF of the fractions $\frac{2}{3}, \frac{4}{9}, \frac{8}{27}$?

(A) $\frac{2}{3}$

(B) $\frac{2}{27}$

(C) $\frac{6}{27}$

(D) $\frac{2}{9}$

Q17. What is the unit digit of 9^{43}?

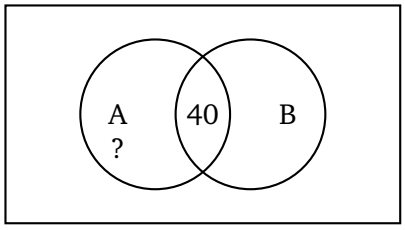
(A) 9

(B) 1

(C) 3

(D) 7

Q18. In a survey of 200 people, 120 read newspaper A, 90 read newspaper B, and 40 read both. How many people read newspaper A only?



(A) 40

(B) 90

(C) 80

(D) 120

Part D: Algebra

Q19. The numerator of a fraction is 4 less than its denominator. If 1 is added to both the numerator and the denominator, the fraction becomes $\frac{3}{4}$. What is the original fraction?

(A) $\frac{7}{11}$

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

(C) $\frac{9}{13}$

(D) $\frac{11}{15}$

Q20. What is the quadratic equation whose roots are 3 and -5?

(A) $x^2 - 2x - 15 = 0$

(B) $x^2 + 2x - 15 = 0$

(C) $x^2 + 2x + 15 = 0$

(D) $x^2 - 2x + 15 = 0$

Q21. How many integer values of x satisfy $-5 < x < 3$?

(A) 7

(B) 8

(C) 6

(D) 9

Q22. What is the middle term of the arithmetic progression $5,\ 8,\ 11,\ \ldots,\ 35$?

(A) 15

(B) 18

(C) 20

(D) 22

Q23. In a geometric progression, the first term is 5 and the common ratio is 3. What is the 4th term?

(A) 45

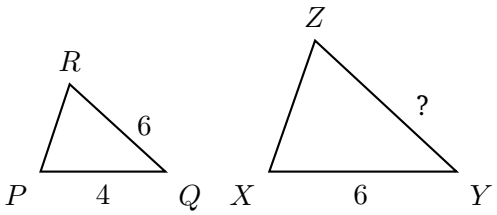
(B) 405

(C) 15

(D) 135

Part E: Geometry and Mensuration

Q24. Triangles PQR and XYZ are similar, with PQ corresponding to XY and QR to YZ. If $PQ = 4$ cm, $QR = 6$ cm and $XY = 6$ cm, what is the length of YZ?



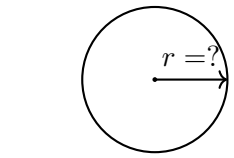
(A) 8 cm

(B) 9 cm

(C) 12 cm

(D) 6 cm

Q25. The circumference of a circle is 44 cm. What is its radius? (Take $\pi = \frac{22}{7}$.)



circumference $= 44$ cm

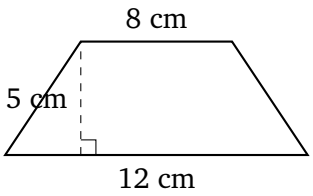
(A) 7 cm

(B) 14 cm

(C) 11 cm

(D) 22 cm

Q26. A trapezium has parallel sides of length 12 cm and 8 cm, and the perpendicular distance between them is 5 cm. What is its area?



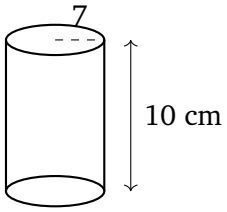
(A) 40 cm^2

(B) 100 cm^2

(C) 50 cm^2

(D) 60 cm^2

Q27. A cylinder has a base radius of 7 cm and a height of 10 cm. What is its curved surface area? (Take $\pi = \frac{22}{7}$.)



(A) 220 cm^2

(B) 308 cm^2

(C) 400 cm^2

(D) 440 cm^2

Part F: Permutation, Combination and Probability

Q28. In how many different ways can the letters of the word "MONEY" be arranged? (All letters are distinct.)

(A) 60

(B) 120

(C) 24

(D) 720

Q29. How many diagonals does a regular octagon (8 sides) have?

(A) 20

(B) 16

(C) 28

(D) 40

Q30. Two fair coins are tossed together once. What is the probability of getting exactly one head?

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

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

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

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

Detailed Solutions

Q1.

Solution

Concept — Discount: Discount = marked price − selling price, and discount percent $= \dfrac{\text{discount}}{\text{marked price}} \times 100$.

Step 1 — Find the discount amount:

$$800 - 680 = 120.$$

Step 2 — Write the discount as a fraction of the marked price:

$$\frac{120}{800}.$$

Step 3 — Convert to a percentage:

$$\frac{120}{800} \times 100 = 15\%.$$

Why other options are wrong:

- Option A: 12% takes the discount as a fraction of the wrong base.
- Option B: 20% overstates the discount amount.
- Option D: 10% would need a selling price of Rs. 720.

Final Answer: Discount $= \frac{120}{800} \times 100 = 15\% \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q1

Q2.

Solution

Concept — Profit and Loss: Selling price = cost price $\times \left(1 + \dfrac{\text{profit\%}}{100}\right)$.

Step 1 — Write the profit factor:

$$1 + \frac{25}{100} = 1.25.$$

Step 2 — Multiply by the cost price:

$$\text{SP} = 1200 \times 1.25.$$

Step 3 — Compute:

$$1200 \times 1.25 = 1500.$$

Why other options are wrong:

- Option B: Rs. 1450 uses a profit of about 20.8%, not 25%.
- Option C: Rs. 1400 uses only a 16.7% profit.
- Option D: Rs. 1520 overstates the profit beyond 25%.

Final Answer: Selling price $= 1200 \times 1.25 =$ Rs. 1500 $\Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q2

Q3.

Solution

Concept — Ratio in a Mixture: The share of an ingredient equals its ratio-part divided by the total parts, multiplied by the whole quantity.

Step 1 — Total number of ratio parts:

$$5 + 3 = 8.$$

Step 2 — Value of one part:

$$\frac{40}{8} = 5 \text{ litres}.$$

Step 3 — Water is 3 parts:

$$3 \times 5 = 15 \text{ litres}.$$

Why other options are wrong:

- Option A: 12 litres does not match a 5 : 3 split of 40.
- Option C: 25 litres is the quantity of milk, not water.
- Option D: 18 litres uses the wrong number of parts.

Final Answer: Water $= 3 \times 5 = 15$ litres $\Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q3

Q4.

Solution

Concept — Correcting an Average: Fix the total by removing the wrong value and adding the correct one, then divide again by the count.

Step 1 — Wrong total from the given average:

$$35 \times 20 = 700.$$

Step 2 — Replace the wrong value with the correct one:

$$700 - 25 + 45 = 720.$$

Step 3 — Divide the corrected total by 20:

$$\frac{720}{20} = 36.$$

Why other options are wrong:

- Option A: 33 subtracts instead of adding the correction.
- Option B: 34 uses only half of the correction.
- Option C: 35 is the original (uncorrected) average.

Final Answer: Correct average $= \frac{720}{20} = 36 \Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q4

Q5.

Solution

Concept — Simple Interest: SI $= \dfrac{P \times R \times T}{100}$, and the time must be written in years.

Step 1 — Convert 8 months into years:

$$T = \frac{8}{12} = \frac{2}{3} \text{ year}.$$

Step 2 — Substitute into the formula:

$$\text{SI} = \frac{7200 \times 5 \times \frac{2}{3}}{100}.$$

Step 3 — Multiply the numerator:

$$7200 \times 5 = 36000, \qquad 36000 \times \frac{2}{3} = 24000.$$

Step 4 — Divide by 100:

$$\frac{24000}{100} = 240.$$

Why other options are wrong:

- Option B: Rs. 250 rounds the time wrongly.
- Option C: Rs. 300 treats the time as one full year.
- Option D: Rs. 200 uses a time of only half a year.

Final Answer: Simple interest = Rs. 240 $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q5

Q6.

Solution

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

Step 1 — Write the growth factor:

$$1 + \frac{5}{100} = 1.05.$$

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

$$(1.05)^2 = 1.1025.$$

Step 3 — Find the amount:

$$8000 \times 1.1025 = 8820.$$

Step 4 — Subtract the principal:

$$8820 - 8000 = 820.$$

Why other options are wrong:

- Option A: Rs. 800 is the simple interest, ignoring interest on interest.
- Option B: Rs. 810 drops part of the second-year interest.
- Option D: Rs. 840 overstates the compounding.

Final Answer: Compound interest $= 8820 - 8000 =$ Rs. 820 $\Rightarrow$ C

Answer: (C) Go Back to Q6

Q7.

Solution

Concept — Alligation: The ratio of the two teas equals the inverse ratio of the distances of their prices from the blend price.

Step 1 — List the prices:

$$\text{Cheaper} = 18, \quad \text{Dearer} = 24, \quad \text{Mean} = 20.$$

Step 2 — Distance of each price from the mean:

$$\text{Dearer side} = 24 - 20 = 4, \qquad \text{Cheaper side} = 20 - 18 = 2.$$

Step 3 — Ratio cheaper : dearer equals these distances:

$$4 : 2 = 2 : 1.$$

Why other options are wrong:

- Option A: 1 : 2 reverses the correct ratio.
- Option C: 3 : 1 gives a blend price below Rs. 20.
- Option D: 1 : 1 gives a blend price of Rs. 21.

Final Answer: The teas must be mixed in the ratio $2 : 1 \Rightarrow$ B

Answer: (B) Go Back to Q7

Q8.

Solution

Concept — Partnership: When capitals stay for different times, profit is shared in the ratio of (capital $\times$ time) for each partner.

Step 1 — Capital-months of each partner:

$$A = 5000 \times 12 = 60000, \qquad B = 6000 \times 8 = 48000.$$

Step 2 — Simplify the ratio:

$$60000 : 48000 = 5 : 4.$$

Step 3 — Total parts and A's share:

$$5 + 4 = 9, \qquad A = \frac{5}{9} \times 4500 = 2500.$$

Why other options are wrong:

- Option A: Rs. 2000 is B's share, not A's.
- Option B: Rs. 2250 splits the profit equally, ignoring the time factor.
- Option C: Rs. 2400 uses the wrong ratio.

Final Answer: A's profit $= \frac{5}{9} \times 4500 =$ Rs. 2500 $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q8

Q9.

Solution

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

Step 1 — Take the original price as 100.

Step 2 — Apply the 25% increase:

$$100 \times 1.25 = 125.$$

Step 3 — Apply the 10% decrease on the new value:

$$125 \times 0.90 = 112.5.$$

Step 4 — Compare with the original:

$$100 \to 112.5 \;\Rightarrow\; \text{an increase of } 12.5\%.$$

Why other options are wrong:

- Option A: 15% increase simply subtracts the two percentages.
- Option B: 10% increase forgets that the decrease acts on a larger base.
- Option D: 12.5% decrease has the direction of change reversed.

Final Answer: The price rises from 100 to 112.5, a 12.5% increase $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q9

Q10.

Solution

Concept — Depreciation: A value falling at a fixed rate each year follows Value $=$ Original $\left(1 - \dfrac{R}{100}\right)^{T}$; rearrange to find the original.

Step 1 — Write the yearly depreciation factor:

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

Step 2 — Apply it for 2 years:

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

Step 3 — Set up the equation and solve for the original value:

$$\text{Original} \times 0.81 = 8100 \;\Rightarrow\; \text{Original} = \frac{8100}{0.81} = 10000.$$

Why other options are wrong:

- Option B: Rs. 9000 uses only one year of depreciation.
- Option C: Rs. 10500 does not satisfy the two-year equation.
- Option D: Rs. 11000 overstates the original value.

Final Answer: Original value $= \frac{8100}{0.81} =$ Rs. 10000 $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q10

Q11.

Solution

Concept — Distance, Speed and Time: Distance = speed × time.

Step 1 — Write the given values:

$$\text{Speed} = 60 \text{ km/h}, \qquad \text{Time} = 2.5 \text{ h}.$$

Step 2 — Multiply speed by time:

$$60 \times 2.5.$$

Step 3 — Compute:

$$60 \times 2.5 = 150 \text{ km}.$$

Why other options are wrong:

- Option A: 120 km uses a time of 2 hours.
- Option C: 24 km divides speed by time instead of multiplying.
- Option D: 180 km uses a time of 3 hours.

Final Answer: Distance $= 60 \times 2.5 = 150$ km $\Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q11

Q12.

Solution

Concept — Boats and Streams: The speed in still water is the average of the downstream and upstream speeds.

Step 1 — Write the two speeds:

$$\text{Downstream} = 15, \qquad \text{Upstream} = 9.$$

Step 2 — Add them:

$$15 + 9 = 24.$$

Step 3 — Halve the sum for the still-water speed:

$$\frac{24}{2} = 12 \text{ km/h}.$$

Why other options are wrong:

- Option A: 3 km/h is the speed of the stream, not the boat.
- Option B: 6 km/h halves only the difference.
- Option C: 9 km/h is the upstream speed.

Final Answer: Still-water speed $= \frac{15+9}{2} = 12$ km/h $\Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q12

Q13.

Solution

Concept — Time and Work: Work done in some days = days $\times$ one-day rate; the fraction left is 1 minus the work done.

Step 1 — One-day work of A:

$$\frac{1}{15}.$$

Step 2 — Work done in 6 days:

$$6 \times \frac{1}{15} = \frac{6}{15} = \frac{2}{5}.$$

Step 3 — Fraction of work left:

$$1 - \frac{2}{5} = \frac{3}{5}.$$

Why other options are wrong:

- Option B: $\frac{2}{5}$ is the work already done, not the work left.
- Option C: $\frac{1}{5}$ uses the wrong number of days.
- Option D: $\frac{2}{3}$ does not match a 6-of-15 split.

Final Answer: Work left $= 1 - \frac{2}{5} = \frac{3}{5} \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q13

Q14.

Solution

Concept — Pipes and Cisterns: A pipe filling a cistern in T hours fills $\frac{1}{T}$ of it each hour; multiply by the time to get the fraction filled.

Step 1 — Fraction filled in one hour:

$$\frac{1}{8}.$$

Step 2 — Multiply by the 3 hours the pipe is open:

$$3 \times \frac{1}{8} = \frac{3}{8}.$$

Why other options are wrong:

- Option A: $\frac{1}{8}$ is the fill in one hour only.
- Option B: $\frac{5}{8}$ is the fraction still empty, not filled.
- Option D: $\frac{3}{5}$ uses the wrong total time.

Final Answer: Fraction filled $= 3 \times \frac{1}{8} = \frac{3}{8} \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q14

Q15.

Solution

Concept — Remainders and Cyclicity: The remainders of powers of a base repeat in a fixed cycle; locate the exponent within that cycle.

Step 1 — Find the cycle of $2^n \bmod 7$:

$$2^1 = 2,\ 2^2 = 4,\ 2^3 = 8 \equiv 1,\ \text{cycle length } 3.$$

Step 2 — Locate the exponent 50 in the cycle:

$$50 \div 3 = 16 \text{ remainder } 2.$$

Step 3 — Remainder 2 points to the second value in the cycle:

$$2^{50} \equiv 2^2 = 4 \pmod 7.$$

Why other options are wrong:

- Option A: 1 is the remainder for an exponent that is a multiple of 3.
- Option B: 2 is the remainder for an exponent $\equiv 1 \pmod 3$.
- Option C: 3 never appears in this cycle.

Final Answer: $2^{50} \equiv 4 \pmod 7 \Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q15

Q16.

Solution

Concept — HCF of Fractions: $\text{HCF of fractions} = \dfrac{\text{HCF of the numerators}}{\text{LCM of the denominators}}$.

Step 1 — HCF of the numerators:

$$\text{HCF}(2, 4, 8) = 2.$$

Step 2 — LCM of the denominators:

$$\text{LCM}(3, 9, 27) = 27.$$

Step 3 — Form the required fraction:

$$\frac{2}{27}.$$

Why other options are wrong:

- Option A: $\frac{2}{3}$ uses the smallest denominator instead of the LCM.
- Option C: $\frac{6}{27}$ uses the wrong numerator.
- Option D: $\frac{2}{9}$ uses 9 instead of the LCM 27.

Final Answer: $\text{HCF} = \dfrac{\text{HCF}(2, 4, 8)}{\text{LCM}(3, 9, 27)} = \frac{2}{27} \Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q16

Q17.

Solution

Concept — Unit Digit Cyclicity: The unit digit of powers of 9 alternates: 9 for odd powers and 1 for even powers.

Step 1 — Write the pattern of unit digits:

$$9^1 = 9,\ 9^2 = 81,\ 9^3 = 729,\ 9^4 = 6561,\ \text{so the units go } 9, 1, 9, 1, \ldots$$

Step 2 — Check whether the exponent 43 is odd or even:

$$43 \text{ is odd.}$$

Step 3 — An odd power of 9 ends in 9:

$$\text{Unit digit} = 9.$$

Why other options are wrong:

- Option B: 1 is the unit digit for even powers of 9.
- Option C: 3 never appears as a unit digit of a power of 9.
- Option D: 7 never appears as a unit digit of a power of 9.

Final Answer: 9^{43} ends in 9 $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q17

Q18.

Solution

Concept — Sets: The number who read a paper only = (total who read that paper) − (those who read both).

Step 1 — People who read newspaper A:

$$n(A) = 120.$$

Step 2 — Subtract those who read both:

$$120 - 40 = 80.$$

Why other options are wrong:

- Option A: 40 counts those who read both, not A only.
- Option B: 90 is the total who read B.
- Option D: 120 is the total who read A, without removing the overlap.

Final Answer: Readers of A only $= 120 - 40 = 80 \Rightarrow$ C

Answer: (C) Go Back to Q18

Q19.

Solution

Concept — Linear Equations: Express the numerator in terms of the denominator, then use the new-fraction condition to form one equation.

Step 1 — Let the denominator be d; the numerator is $d-4$:

$$\text{Fraction} = \frac{d-4}{d}.$$

Step 2 — Add 1 to both and set equal to $\frac{3}{4}$:

$$\frac{d-4+1}{d+1} = \frac{3}{4} \;\Rightarrow\; \frac{d-3}{d+1} = \frac{3}{4}.$$

Step 3 — Cross-multiply:

$$4(d-3) = 3(d+1) \;\Rightarrow\; 4d - 12 = 3d + 3.$$

Step 4 — Solve for d and write the fraction:

$$d = 15, \quad \text{numerator} = 15 - 4 = 11, \quad \text{Fraction} = \frac{11}{15}.$$

Why other options are wrong:

- Option A: $\frac{7}{11}$ does not give $\frac{3}{4}$ after adding 1 to each part.
- Option B: $\frac{3}{4}$ is the result after the change, not the original.
- Option C: $\frac{9}{13}$ has a numerator only 4 less but fails the $\frac{3}{4}$ test.

Final Answer: The original fraction is $\frac{11}{15} \Rightarrow$ D

Answer: (D) Go Back to Q19

Q20.

Solution

Concept — Forming a Quadratic: A quadratic with roots α and β is $x^2 - (\alpha + \beta)x + \alpha\beta = 0$.

Step 1 — Sum of the roots:

$$3 + (-5) = -2.$$

Step 2 — Product of the roots:

$$3 \times (-5) = -15.$$

Step 3 — Substitute into the standard form:

$$x^2 - (-2)x + (-15) = x^2 + 2x - 15 = 0.$$

Why other options are wrong:

- Option A: $x^2 - 2x - 15 = 0$ uses the wrong sign for the sum term.
- Option C: $x^2 + 2x + 15 = 0$ uses the wrong sign for the product.
- Option D: $x^2 - 2x + 15 = 0$ has both middle and constant signs wrong.

Final Answer: The equation is $x^2 + 2x - 15 = 0 \Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q20

Q21.

Solution

Concept — Counting Integers: List the integers strictly between the two bounds and count them.

Step 1 — Write the bounds:

$$-5 < x < 3.$$

Step 2 — List the integers that lie strictly between them:

$$x = -4,\ -3,\ -2,\ -1,\ 0,\ 1,\ 2.$$

Step 3 — Count the values:

$$7 \text{ integers.}$$

Why other options are wrong:

- Option B: 8 wrongly includes one of the endpoints.
- Option C: 6 misses one of the listed integers.
- Option D: 9 counts both endpoints, which are excluded.

Final Answer: There are 7 integers (-4 to 2) $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q21

Q22.

Solution

Concept — Middle Term of an AP: For an AP with an odd number of terms, the middle term equals the average of the first and last terms.

Step 1 — Find the number of terms using $a_n = a + (n-1)d$:

$$35 = 5 + (n-1) \times 3 \;\Rightarrow\; 30 = 3(n-1) \;\Rightarrow\; n = 11.$$

Step 2 — With 11 terms, the middle term is the 6th term:

$$\text{Middle position} = \frac{11+1}{2} = 6.$$

Step 3 — Middle term equals the average of the first and last terms:

$$\frac{5+35}{2} = \frac{40}{2} = 20.$$

Why other options are wrong:

- Option A: 15 is the 4th term, not the middle.
- Option B: 18 is not a term of this AP.
- Option D: 22 is not a term of this AP.

Final Answer: The middle term is $\frac{5+35}{2} = 20 \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q22

Q23.

Solution

Concept — Geometric Progression: The nth term is $a_n = a\,r^{\,n-1}$, where a is the first term and r the common ratio.

Step 1 — Write the known values:

$$a = 5, \quad r = 3, \quad n = 4.$$

Step 2 — Substitute into the formula:

$$a_4 = 5 \times 3^{\,4-1} = 5 \times 3^3.$$

Step 3 — Evaluate the power and multiply:

$$3^3 = 27, \qquad 5 \times 27 = 135.$$

Why other options are wrong:

- Option A: 45 is the 3rd term (5×3^2).
- Option B: 405 is the 5th term (5×3^4).
- Option C: 15 is the 2nd term (5×3^1).

Final Answer: The 4th term is $5 \times 3^3 = 135 \Rightarrow$ D

Answer: (D) Go Back to Q23

Q24.

Solution

Concept — Similar Triangles: In similar triangles, corresponding sides are in the same ratio.

Step 1 — Ratio of the two corresponding known sides:

$$\frac{XY}{PQ} = \frac{6}{4} = \frac{3}{2}.$$

Step 2 — Apply the same ratio to QR and YZ:

$$\frac{YZ}{QR} = \frac{3}{2} \;\Rightarrow\; YZ = 6 \times \frac{3}{2}.$$

Step 3 — Compute:

$$6 \times \frac{3}{2} = 9 \text{ cm}.$$

Why other options are wrong:

- Option A: 8 cm uses an additive difference instead of the ratio.
- Option C: 12 cm doubles QR rather than scaling by $\frac{3}{2}$.
- Option D: 6 cm ignores the enlargement altogether.

Final Answer: $YZ = 6 \times \frac{3}{2} = 9$ cm $\Rightarrow$ B

Answer: (B) Go Back to Q24

Q25.

Solution

Concept — Circumference of a Circle: Circumference $= 2\pi r$, so $r = \dfrac{\text{circumference}}{2\pi}$.

Step 1 — Write the equation:

$$2 \times \frac{22}{7} \times r = 44.$$

Step 2 — Simplify the coefficient of r:

$$\frac{44}{7} r = 44.$$

Step 3 — Solve for r:

$$r = 44 \times \frac{7}{44} = 7 \text{ cm}.$$

Why other options are wrong:

- Option B: 14 cm is the diameter, not the radius.
- Option C: 11 cm does not satisfy $2\pi r = 44$.
- Option D: 22 cm confuses the radius with half the circumference.

Final Answer: Radius $= \dfrac{44}{2\pi} = 7$ cm $\Rightarrow$ A

Answer: (A) Go Back to Q25

Q26.

Solution

Concept — Area of a Trapezium: Area $= \frac{1}{2} \times$ (sum of parallel sides) $\times$ height.

Step 1 — Add the two parallel sides:

$$12 + 8 = 20.$$

Step 2 — Multiply by the height:

$$20 \times 5 = 100.$$

Step 3 — Take half of the product:

$$\frac{1}{2} \times 100 = 50 \text{ cm}^2.$$

Why other options are wrong:

- Option A: 40 cm^2 uses only one parallel side.
- Option B: 100 cm^2 forgets to halve the product.
- Option D: 60 cm^2 multiplies the sides wrongly.

Final Answer: Area $= \frac{1}{2}(12 + 8) \times 5 = 50 \text{ cm}^2 \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q26

Q27.

Solution

Concept — Curved Surface Area of a Cylinder: CSA $= 2\pi rh$, where r is the base radius and h the height.

Step 1 — Substitute the values:

$$2 \times \frac{22}{7} \times 7 \times 10.$$

Step 2 — Cancel the 7 with the radius:

$$2 \times 22 \times 10.$$

Step 3 — Multiply:

$$2 \times 22 \times 10 = 440 \text{ cm}^2.$$

Why other options are wrong:

- Option A: 220 cm^2 forgets the factor of 2.
- Option B: 308 cm^2 uses the wrong height.
- Option C: 400 cm^2 approximates π incorrectly.

Final Answer: CSA $= 2\pi rh = 440$ $\text{cm}^2 \Rightarrow$ D

Answer: (D) Go Back to Q27

Q28.

Solution

Concept — Permutations: The number of arrangements of n distinct objects in a row is $n!$.

Step 1 — Count the distinct letters in "MONEY":

$$\text{M, O, N, E, Y} \Rightarrow n = 5 \text{ (all different)}.$$

Step 2 — Compute $5!$:

$$5! = 5 \times 4 \times 3 \times 2 \times 1.$$

Step 3 — Multiply step by step:

$$5 \times 4 = 20, \quad 20 \times 3 = 60, \quad 60 \times 2 = 120, \quad 120 \times 1 = 120.$$

Why other options are wrong:

- Option A: 60 computes only $5 \times 4 \times 3$.
- Option C: 24 is $4!$, using one letter too few.
- Option D: 720 is $6!$, using one letter too many.

Final Answer: Number of arrangements $= 5! = 120 \Rightarrow$ B

Answer: (B) Go Back to Q28

Q29.

Solution

Concept — Diagonals of a Polygon: A polygon with n sides has $\frac{n(n-3)}{2}$ diagonals.

Step 1 — Substitute $n = 8$:

$$\frac{8(8-3)}{2}.$$

Step 2 — Simplify the bracket:

$$\frac{8 \times 5}{2}.$$

Step 3 — Compute:

$$\frac{40}{2} = 20.$$

Why other options are wrong:

- Option B: 16 subtracts the wrong number of sides.
- Option C: 28 uses $\frac{n(n-1)}{2}$, which counts all line segments.
- Option D: 40 forgets to divide by 2.

Final Answer: Diagonals $= \frac{8\times5}{2} = 20 \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q29

Q30.

Solution

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

Step 1 — List all outcomes of tossing two coins:

$$\{HH,\ HT,\ TH,\ TT\} \ \Rightarrow\ 4 \text{ outcomes.}$$

Step 2 — Count outcomes with exactly one head:

$$\{HT,\ TH\} \ \Rightarrow\ 2 \text{ outcomes.}$$

Step 3 — Form the probability:

$$\frac{2}{4} = \frac{1}{2}.$$

Why other options are wrong:

- Option A: $\frac{1}{4}$ is the probability of no head at all.
- Option B: $\frac{3}{4}$ is the probability of at least one head.
- Option D: $\frac{1}{3}$ uses the wrong total number of outcomes.

Final Answer: $P(\text{exactly one head}) = \frac{2}{4} = \frac{1}{2} \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q30

Answer Key

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