# IBSAT Quantitative Aptitude

## Sample Paper – 3

**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.** A person saves 20% of his monthly salary and spends the rest. If his monthly expenditure is Rs. 24000, what is his monthly salary?

(A) Rs. 30000

(B) Rs. 28000

(C) Rs. 32000

(D) Rs. 36000

**Q2.** An article is sold for Rs. 1150 at a profit of 15%. What was its cost price?

(A) Rs. 1150

(B) Rs. 950

(C) Rs. 1000

(D) Rs. 1050

**Q3.** The ages of A and B are in the ratio 5 : 7. If the sum of their ages is 48 years, what is B's age?

(A) 20 years

(B) 24 years

(C) 21 years

(D) 28 years

**Q4.** The average of 6 numbers is 18. When a new number is added to the set, the average of all 7 numbers becomes 20. What is the new number?

(A) 30

(B) 32

(C) 26

(D) 20

**Q5.** In how many years will a sum of Rs. 4000 earn a simple interest of Rs. 600 at the rate of 5% per annum?

(A) 3 years

(B) 4 years

(C) 2 years

(D) 5 years

**Q6.** Find the difference between the compound interest and the simple interest on Rs. 8000 at 10% per annum for 2 years.

(A) Rs. 100

(B) Rs. 160

(C) Rs. 120

(D) Rs. 80

**Q7.** In what ratio must tea costing Rs. 45 per kg be mixed with tea costing Rs. 60 per kg so that the mixture is worth Rs. 50 per kg?

(A) 1 : 2

(B) 3 : 2

(C) 2 : 1

(D) 3 : 1

**Q8.** A invests Rs. 5000 for 8 months and B invests Rs. 6000 for 5 months in a business. If the total profit is Rs. 7000, what is A's share?

(A) Rs. 4000

(B) Rs. 3000

(C) Rs. 3500

(D) Rs. 4500

**Q9.** The price of a product is first increased by 10% and then the new price is increased again by 20%. What is the overall percentage increase in the price?

(A) 30% increase

(B) 32% increase

(C) 28% increase

(D) 33% increase

**Q10.** The population of a village is 10000 and it grows at the rate of 10% every year. What will the population be after 3 years?

(A) 13000

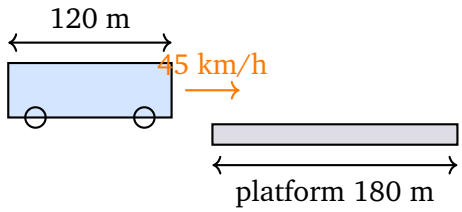
(B) 13200

(C) 13310

(D) 13100

## Part B: Speed, Time and Work

**Q11.** A train 120 metres long is running at a speed of 45 km/h. How many seconds will it take to cross a platform 180 metres long?




(A) 20

(B) 18

(C) 30

(D) 24

**Q12.** A boat travels downstream at 14 km/h and upstream at 8 km/h. What is the speed of the stream?

(A) 3 km/h

(B) 6 km/h

(C) 11 km/h

(D) 2 km/h

**Q13.** A can do a piece of work in 6 days, B in 12 days and C in 12 days. Working together, in how many days will they complete the work?

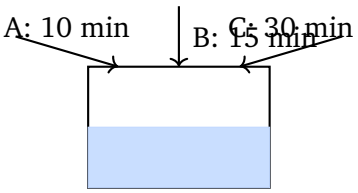
(A) 2

(B) 5

(C) 3

(D) 4

**Q14.** Three pipes A, B and C can fill a tank in 10 minutes, 15 minutes and 30 minutes respectively. If all three are opened together, how long will it take to fill the tank?




(A) 6 minutes

(B) 5 minutes

(C) 8 minutes

(D) 10 minutes

## Part C: Number System

**Q15.** What is the remainder when the product $17 \times 23 \times 19$ is divided by 5?

(A) 4

(B) 2

(C) 3

(D) 1

**Q16.** What is the HCF (highest common factor) of the numbers 24, 36 and 60?

(A) 6

(B) 4

(C) 18

(D) 12

**Q17.** What is the unit digit of $7^{53}$?

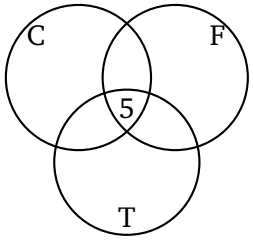
(A) 1

(B) 9

(C) 7

(D) 3

**Q18.** In a class, 40 students like cricket, 30 like football and 20 like tennis. Also, 12 like both cricket and football, 8 like both football and tennis, 10 like both cricket and tennis, and 5 like all three. How many students like exactly one of these three sports?




(A) 40

(B) 45

(C) 50

(D) 35

## Part D: Algebra

**Q19.** The sum of the digits of a two-digit number is 9. When the digits are reversed, the number decreases by 27. What is the original number?

(A) 63

(B) 36

(C) 72

(D) 54

**Q20.** What is the larger root of the quadratic equation $x^2 - 9x + 20 = 0$?

(A) 2

(B) 3

(C) 4

(D) 5

**Q21.** What is the least integer value of $x$ that satisfies the inequality $3x - 7 > 5$?

(A) 3

(B) 4

(C) 5

(D) 6

**Q22.** In an arithmetic progression with first term 3 and common difference 4, which term of the progression is equal to 43?

(A) 11th

(B) 10th

(C) 12th

(D) 9th

**Q23.** The first term of a geometric progression is 4 and its third term is 36. What is the common ratio (given that it is positive)?

(A) 2

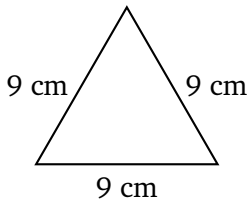
(B) 3

(C) 4

(D) 6

## Part E: Geometry and Mensuration

**Q24.** What is the perimeter of an equilateral triangle whose side measures 9 cm?



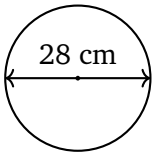

(A) 18 cm

(B) 21 cm

(C) 24 cm

(D) 27 cm

**Q25.** What is the area of a circle whose diameter is 28 cm? (Take $\pi = \frac{22}{7}$.)



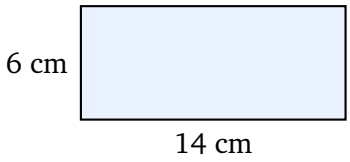

(A) 308 $cm^2$

(B) 154 $cm^2$

(C) 616 $cm^2$

(D) 462 $cm^2$

**Q26.** A rectangle has a length of 14 cm and a width of 6 cm. What is its perimeter?



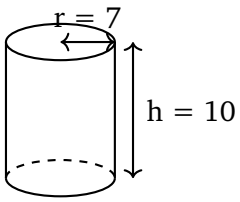

(A) 40 cm

(B) 20 cm

(C) 84 cm

(D) 44 cm

**Q27.** What is the volume of a cylinder whose base radius is 7 cm and height is 10 cm? (Take $\pi = \frac{22}{7}$.)




(A) 770 $cm^3$

(B) 1540 $cm^3$

(C) 2200 $cm^3$

(D) 1400 $cm^3$

## Part F: Permutation, Combination and Probability

**Q28.** How many 3-digit numbers can be formed using the digits 1, 2, 3, 4 and 5 if no digit is repeated?

(A) 125

(B) 120

(C) 60

(D) 10

**Q29.** At a party, there are 12 people and each person shakes hands exactly once with every other person. What is the total number of handshakes?

(A) 144

(B) 132

(C) 72

(D) 66

**Q30.** A card is drawn at random from a standard pack of 52 playing cards. What is the probability that it is a king?

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

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

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

(D) $\frac{4}{13}$

## Detailed Solutions

### Q1.

**Solution**

**Concept — Percentage:** If a person saves a certain percent of the salary, the rest is spent; the spent part is the remaining percentage of the same salary.

**Step 1 — Find the percentage spent:**

$$100\% - 20\% = 80\%.$$

**Step 2 — The expenditure is 80% of the salary:**

$$80\% \text{ of salary} = 24000.$$

**Step 3 — Write 80% as a fraction:**

$$\frac{80}{100} \times \text{salary} = 24000.$$

**Step 4 — Solve for the salary:**

$$\text{salary} = \frac{24000 \times 100}{80} = 30000.$$

**Why other options are wrong:**

- Option B: Rs. 28000 does not give Rs. 24000 as 80% of it.
- Option C: Rs. 32000 would make the expenditure Rs. 25600.
- Option D: Rs. 36000 treats Rs. 24000 as two-thirds of the salary.

**Final Answer:** Salary $= \frac{24000 \times 100}{80} = \text{Rs. } 30000 \Rightarrow \boxed{\text{A}}$

**Answer: (A)** Go Back to Q1

### Q2.

**Solution**

**Concept — Profit and Loss:** Selling price $=$ cost price $\times \left(1 + \frac{\text{profit\%}}{100}\right)$, so cost price $= \frac{\text{SP}}{1 + \text{profit\%}/100}$.

**Step 1 — Write the profit factor:**

$$1 + \frac{15}{100} = 1.15.$$

**Step 2 — Set up the equation:**

$$\text{CP} \times 1.15 = 1150.$$

**Step 3 — Solve for the cost price:**

$$\text{CP} = \frac{1150}{1.15}.$$

**Step 4 — Compute:**

$$\frac{1150}{1.15} = 1000.$$

**Why other options are wrong:**

- Option A: Rs. 1150 is the selling price, not the cost.
- Option B: Rs. 950 does not yield Rs. 1150 after a 15% profit.
- Option D: Rs. 1050 gives a profit of less than 10%.

**Final Answer:** Cost price $= \frac{1150}{1.15} =$ Rs. 1000 $\Rightarrow$ C

**Answer: (C)** Go Back to Q2

## Q3.

### Solution

**Concept — Ratio and Proportion:** Divide the total into parts using the ratio, find one part, then take the required number of parts.

**Step 1 — Total number of parts:**

$$5 + 7 = 12.$$

**Step 2 — Value of one part:**

$$\frac{48}{12} = 4.$$

**Step 3 — B's age is 7 parts:**

$$7 \times 4 = 28.$$

**Why other options are wrong:**

- Option A: 20 years is A's age (5 parts), not B's.
- Option B: 24 years splits the sum equally, ignoring the ratio.
- Option C: 21 years uses a wrong value for one part.

**Final Answer:** B's age $= 7 \times 4 = 28$ years $\Rightarrow \boxed{\text{D}}$

**Answer: (D)** Go Back to Q3

## Q4.

**Solution**

**Concept — Averages:** The sum of a set equals its average times the count; the added value is the new sum minus the old sum.

**Step 1 — Sum of the first 6 numbers:**

$$18 \times 6 = 108.$$

**Step 2 — Sum of all 7 numbers:**

$$20 \times 7 = 140.$$

**Step 3 — The new number is the difference:**

$$140 - 108 = 32.$$

**Why other options are wrong:**

- Option A: 30 assumes the average rose by less than it did.
- Option C: 26 uses a wrong sum for the 7 numbers.
- Option D: 20 is just the new average, not the added number.

**Final Answer:** New number $= 140 - 108 = 32 \Rightarrow \boxed{\text{B}}$

**Answer: (B)** 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:**

$$T = \frac{600 \times 100}{4000 \times 5}.$$

**Step 2 — Multiply the numerator:**

$$600 \times 100 = 60000.$$

**Step 3 — Multiply the denominator:**

$$4000 \times 5 = 20000.$$

**Step 4 — Divide:**

$$\frac{60000}{20000} = 3.$$

**Why other options are wrong:**

- Option B: 4 years would give an interest of Rs. 800.
- Option C: 2 years would give only Rs. 400.
- Option D: 5 years would give Rs. 1000.

**Final Answer:** Time $= \frac{600 \times 100}{4000 \times 5} = 3$ years $\Rightarrow \boxed{\text{A}}$

**Answer: (A)** Go Back to Q5

## Q6.

**Solution**

**Concept — CI minus SI (2 years):** For 2 years, the difference between compound and simple interest is $P\left(\dfrac{R}{100}\right)^2$.

**Step 1 — Write the rate as a fraction:**

$$\frac{R}{100} = \frac{10}{100} = 0.1.$$

**Step 2 — Square the rate fraction:**

$$(0.1)^2 = 0.01.$$

**Step 3 — Multiply by the principal:**

$$8000 \times 0.01 = 80.$$

**Why other options are wrong:**

- Option A: Rs. 100 uses a principal of Rs. 10000.
- Option B: Rs. 160 doubles the correct difference.
- Option C: Rs. 120 has no valid basis here.

**Final Answer:** Difference $= 8000 \times (0.1)^2 =$ Rs. 80 $\Rightarrow$ D

**Answer: (D)** Go Back to Q6

## Q7.

### Solution

**Concept — Alligation:** The ratio of the two ingredients equals the inverse ratio of the distances of their prices from the mean price.

**Step 1 — List the prices:**

$$\text{Cheaper} = 45, \quad \text{Dearer} = 60, \quad \text{Mean} = 50.$$

**Step 2 — Distance of the dearer price from the mean:**

$$60 - 50 = 10.$$

**Step 3 — Distance of the cheaper price from the mean:**

$$50 - 45 = 5.$$

**Step 4 — Ratio cheaper : dearer is the inverse of these distances:**

$$10 : 5 = 2 : 1.$$

**Why other options are wrong:**

- Option A: $1:2$ is the reversed (inverted) ratio.
- Option B: $3:2$ gives a mean price above Rs. 50.
- Option D: $3:1$ gives a mean of about Rs. 48.75.

**Final Answer:** The tea must be mixed in the ratio $2:1 \Rightarrow \boxed{\text{C}}$

**Answer: (C)** Go Back to Q7

## Q8.

### Solution

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

**Step 1 — Capital-months of A:**

$$5000 \times 8 = 40000.$$

**Step 2 — Capital-months of B:**

$$6000 \times 5 = 30000.$$

**Step 3 — Ratio of the shares:**

$$40000 : 30000 = 4 : 3.$$

**Step 4 — A's share is 4 of the 7 parts:**

$$\frac{4}{7} \times 7000 = 4000.$$

**Why other options are wrong:**

- Option B: Rs. 3000 is B's share, not A's.
- Option C: Rs. 3500 splits the profit equally, ignoring the ratio.
- Option D: Rs. 4500 exceeds A's correct four-sevenths share.

**Final Answer:** A's share $= \frac{4}{7} \times 7000 =$ Rs. 4000 $\Rightarrow \boxed{\text{A}}$

**Answer: (A)** Go Back to Q8

## Q9.

**Solution**

**Concept — Successive Percentage Change:** Apply each increase as a multiplying factor to the value one after the other, then compare with the original.

**Step 1 — Take the original price as 100.**

**Step 2 — Apply the 10% increase:**

$$100 \times 1.10 = 110.$$

**Step 3 — Apply the 20% increase on the new value:**

$$110 \times 1.20 = 132.$$

**Step 4 — Compare with the original:**

$$132 - 100 = 32 \;\Rightarrow\; \text{an increase of } 32\%.$$

**Why other options are wrong:**

- Option A: 30% just adds 10 and 20 without the extra product term.
- Option C: 28% uses a decrease in one step by mistake.
- Option D: 33% overstates the combined effect.

**Final Answer:** The price rises from 100 to 132, a $32\%$ increase $\Rightarrow$ $\boxed{\text{B}}$

**Answer: (B)** Go Back to Q9

## Q10.

**Solution**

**Concept — Percentage Growth:** A quantity growing at a fixed rate each year follows $P\left(1+\frac{R}{100}\right)^{T}$.

**Step 1 — Write the yearly growth factor:**

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

**Step 2 — Raise it to the power 3:**

$$(1.1)^3 = 1.331.$$

**Step 3 — Multiply by the starting population:**

$$10000 \times 1.331 = 13310.$$

**Why other options are wrong:**

- Option A: 13000 adds a flat 30% without compounding.
- Option B: 13200 counts only part of the third-year growth.
- Option D: 13100 has no valid basis here.

**Final Answer:** Population $= 10000 \times (1.1)^3 = 13310 \Rightarrow$ C

**Answer: (C)** Go Back to Q10

## Q11.

### Solution

**Concept — Time, Speed and Distance:** To cross a platform, a train must cover a distance equal to its own length plus the platform length.

**Step 1 — Convert the speed to metres per second:**

$$45 \text{ km/h} = 45 \times \frac{5}{18} = 12.5 \text{ m/s}.$$

**Step 2 — Total distance to cover:**

$$120 + 180 = 300 \text{ m}.$$

**Step 3 — Time $= \dfrac{\text{distance}}{\text{speed}}$:**

$$\frac{300}{12.5} = 24 \text{ seconds}.$$

**Why other options are wrong:**

- Option A: 20 s ignores the train's own length.
- Option B: 18 s uses only the platform length wrongly.

- Option C: 30 s uses a speed of 10 m/s.

**Final Answer:** Time $= \frac{300}{12.5} = 24$ seconds $\Rightarrow$ $\boxed{\text{D}}$

**Answer: (D)** Go Back to Q11

## Q12.

### Solution

**Concept — Boats and Streams:** Stream speed $= \dfrac{\text{downstream speed} - \text{upstream speed}}{2}$, because the current adds one way and subtracts the other.

**Step 1 — Subtract the two speeds:**

$$14 - 8 = 6.$$

**Step 2 — Divide by 2 to isolate the stream speed:**

$$\frac{6}{2} = 3 \text{ km/h}.$$

**Why other options are wrong:**

- Option B: 6 km/h forgets to halve the difference.
- Option C: 11 km/h is the boat's speed in still water.
- Option D: 2 km/h uses a wrong difference.

**Final Answer:** Stream speed $= \frac{14-8}{2} = 3$ km/h $\Rightarrow$ $\boxed{\text{A}}$

**Answer: (A)** Go Back to Q12

## Q13.

### Solution

**Concept — Time and Work:** Add the one-day work rates of all workers, then invert the total to get the days needed together.

**Step 1 — One-day work of each:**

$$A = \frac{1}{6}, \qquad B = \frac{1}{12}, \qquad C = \frac{1}{12}.$$

**Step 2 — Take a common denominator of 12:**

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

**Step 3 — Simplify the combined rate:**

$$\frac{4}{12} = \frac{1}{3}.$$

**Step 4 — Time together is the reciprocal:**

$$\frac{1}{1/3} = 3 \text{ days}.$$

**Why other options are wrong:**

- Option A: 2 days overstates the combined speed.
- Option B: 5 days is slower than A alone, which is impossible.
- Option D: 4 days uses a wrong sum of the rates.

**Final Answer:** Together they finish in 3 days $\Rightarrow$ $\boxed{\text{C}}$

**Answer: (C)** Go Back to Q13

## Q14.

**Solution**

**Concept — Pipes and Cisterns:** Each filling pipe adds part of the tank per minute; add the per-minute rates and invert for the filling time.

**Step 1 — Per-minute filling of each pipe:**

$$A = \frac{1}{10}, \qquad B = \frac{1}{15}, \qquad C = \frac{1}{30}.$$

**Step 2 — Take a common denominator of 30:**

$$\frac{3}{30} + \frac{2}{30} + \frac{1}{30} = \frac{6}{30}.$$

**Step 3 — Simplify the combined rate:**

$$\frac{6}{30} = \frac{1}{5}.$$

**Step 4 — Time to fill is the reciprocal:**

$$\frac{1}{1/5} = 5 \text{ minutes.}$$

**Why other options are wrong:**

- Option A: 6 minutes uses a wrong sum of the rates.
- Option C: 8 minutes understates the combined rate.
- Option D: 10 minutes ignores pipes B and C.

**Final Answer:** All three pipes fill the tank in 5 minutes $\Rightarrow$ $\boxed{\text{B}}$

**Answer: (B)** Go Back to Q14

## Q15.

**Solution**

**Concept — Remainder of a Product:** Replace each factor by its remainder modulo $n$, multiply the remainders, then take that result modulo $n$.

**Step 1 — Reduce each factor modulo 5:**

$$17 \equiv 2, \qquad 23 \equiv 3, \qquad 19 \equiv 4 \pmod 5.$$

**Step 2 — Multiply the remainders:**

$$2 \times 3 \times 4 = 24.$$

**Step 3 — Reduce this product modulo 5:**

$$24 = 5 \times 4 + 4 \;\Rightarrow\; 24 \equiv 4 \pmod 5.$$

**Why other options are wrong:**

- Option B: 2 uses only one of the three factors.
- Option C: 3 drops a factor from the product.
- Option D: 1 has no valid basis for this product.

**Final Answer:** Remainder $= 24 \bmod 5 = 4 \Rightarrow$ $\boxed{\text{A}}$

**Answer: (A)** Go Back to Q15

## Q16.

**Solution**

**Concept — HCF by Prime Factorisation:** The HCF is the product of the common prime factors taken to their lowest powers.

**Step 1 — Factorise each number:**

$$24 = 2^3 \times 3, \quad 36 = 2^2 \times 3^2, \quad 60 = 2^2 \times 3 \times 5.$$

**Step 2 — Lowest power of the common factor 2:**

$$2^2.$$

**Step 3 — Lowest power of the common factor 3:**

$$3^1.$$

**Step 4 — Multiply the common parts:**

$$2^2 \times 3 = 4 \times 3 = 12.$$

**Why other options are wrong:**

- Option A: 6 misses the factor $2^2$ and uses only $2 \times 3$.
- Option B: 4 drops the common factor 3.
- Option C: 18 is not a factor of 24 or 60.

**Final Answer:** HCF $= 2^2 \times 3 = 12 \Rightarrow$ D

**Answer: (D)** Go Back to Q16

## Q17.

**Solution**

**Concept — Unit Digit Cyclicity:** The unit digit of powers of 7 repeats in the cycle $7, 9, 3, 1$ with length 4.

**Step 1 — Write the cycle of unit digits:**

$$7^1 = 7, \; 7^2 = 49, \; 7^3 = 343, \; 7^4 = 2401 \; \Rightarrow \; 7, 9, 3, 1.$$

**Step 2 — Find the position of 53 in the cycle:**

$$53 \div 4 = 13 \text{ remainder } 1.$$

**Step 3 — Remainder 1 points to the first digit of the cycle:**

$$\text{Unit digit} = 7.$$

**Why other options are wrong:**

- Option A: 1 corresponds to a power that is a multiple of 4.
- Option B: 9 corresponds to a power $\equiv 2 \pmod 4$.
- Option D: 3 corresponds to a power $\equiv 3 \pmod 4$.

**Final Answer:** The unit digit of $7^{53}$ is 7 $\Rightarrow$ C

**Answer: (C)** Go Back to Q17

## Q18.

### Solution

**Concept — Sets (Exactly One):** The number liking exactly one sport is found by taking each single set and removing both pairwise overlaps, then adding back the triple overlap once.

**Step 1 — Students liking only cricket:**

$$40 - 12 - 10 + 5 = 23.$$

**Step 2 — Students liking only football:**

$$30 - 12 - 8 + 5 = 15.$$

**Step 3 — Students liking only tennis:**

$$20 - 10 - 8 + 5 = 7.$$

**Step 4 — Add the three "only" counts:**

$$23 + 15 + 7 = 45.$$

**Why other options are wrong:**

- Option A: 40 forgets to add back the triple overlap in each region.
- Option C: 50 counts some overlap students more than once.
- Option D: 35 subtracts the triple overlap instead of adding it.

**Final Answer:** Students liking exactly one sport $= 23 + 15 + 7 = 45 \Rightarrow \boxed{\text{B}}$

**Answer: (B)** Go Back to Q18

## Q19.

### Solution

**Concept — Two-digit Numbers:** Write the number as $10a + b$ (tens digit $a$, units digit $b$); reversing gives $10b + a$.

**Step 1 — Use the digit-sum condition:**

$$a + b = 9.$$

**Step 2 — Use the "decreases by 27" condition:**

$$(10a + b) - (10b + a) = 27.$$

**Step 3 — Simplify the left side:**

$$9a - 9b = 27 \;\Rightarrow\; a - b = 3.$$

**Step 4 — Solve the two equations:**

$$a + b = 9,\; a - b = 3 \;\Rightarrow\; a = 6,\; b = 3.$$

**Step 5 — Form the number:**

$$10a + b = 60 + 3 = 63.$$

**Why other options are wrong:**

- Option B: 36 is the reversed number, which is smaller.
- Option C: 72 gives a digit sum of 9 but a difference of 45 on reversal.
- Option D: 54 changes by only 9 when reversed.

**Final Answer:** The original number is $63 \Rightarrow \boxed{A}$

**Answer: (A)** Go Back to Q19

## Q20.

### Solution

**Concept — Factorising a Quadratic:** Split the middle term so the equation factorises into two linear factors, then read off the roots.

**Step 1 — Find two numbers with product 20 and sum 9:**

$$4 \times 5 = 20, \qquad 4 + 5 = 9.$$

**Step 2 — Factorise the quadratic:**

$$x^2 - 9x + 20 = (x - 4)(x - 5).$$

**Step 3 — Set each factor to zero:**

$$x - 4 = 0 \;\Rightarrow\; x = 4, \qquad x - 5 = 0 \;\Rightarrow\; x = 5.$$

**Step 4 — Pick the larger root:**

$$\max(4, 5) = 5.$$

**Why other options are wrong:**

- Option A: 2 is not a root of this equation.
- Option B: 3 is not a root of this equation.
- Option C: 4 is the smaller root, not the larger.

**Final Answer:** The larger root is $5 \Rightarrow \boxed{D}$

**Answer: (D)** Go Back to Q20

## Q21.

**Solution**

**Concept — Linear Inequalities:** Solve the inequality for $x$, then choose the smallest integer that lies in the solution range.

**Step 1 — Add 7 to both sides:**

$$3x > 12.$$

**Step 2 — Divide both sides by 3:**

$$x > 4.$$

**Step 3 — Find the least integer greater than 4:**

$$x = 5.$$

**Why other options are wrong:**

- Option A: 3 does not satisfy $x > 4$.
- Option B: 4 gives $3x - 7 = 5$, which is not strictly greater than 5.
- Option D: 6 satisfies the inequality but is not the least such integer.

**Final Answer:** The least integer is $x = 5 \Rightarrow \boxed{\text{C}}$

**Answer: (C)** Go Back to Q21

## Q22.

**Solution**

**Concept — Arithmetic Progression:** The $n$th term is $a_n = a + (n-1)d$; set it equal to the target value and solve for $n$.

**Step 1 — Write the term equation:**

$$3 + (n-1) \times 4 = 43.$$

**Step 2 — Subtract 3 from both sides:**

$$(n-1) \times 4 = 40.$$

**Step 3 — Divide by 4:**

$$n - 1 = 10.$$

**Step 4 — Solve for $n$:**

$$n = 11.$$

**Why other options are wrong:**

- Option B: the 10th term is $3 + 9 \times 4 = 39$, not 43.
- Option C: the 12th term is $3 + 11 \times 4 = 47$, too large.
- Option D: the 9th term is $3 + 8 \times 4 = 35$, too small.

**Final Answer:** 43 is the 11th term $\Rightarrow$ A

**Answer: (A)** Go Back to Q22

## Q23.

### Solution

**Concept — Geometric Progression:** The $n$th term is $a\,r^{n-1}$, so the third term is $a\,r^2$; use it to find the common ratio $r$.

**Step 1 — Write the third-term equation:**

$$a\,r^2 = 36 \;\Rightarrow\; 4\,r^2 = 36.$$

**Step 2 — Divide both sides by 4:**

$$r^2 = 9.$$

**Step 3 — Take the positive square root:**

$$r = 3.$$

**Why other options are wrong:**

- Option A: with $r = 2$ the third term would be $4 \times 4 = 16$.
- Option C: with $r = 4$ the third term would be $4 \times 16 = 64$.
- Option D: with $r = 6$ the third term would be $4 \times 36 = 144$.

**Final Answer:** The common ratio is $r = 3 \Rightarrow$ B

**Answer: (B)** Go Back to Q23

## Q24.

### Solution

**Concept — Perimeter of an Equilateral Triangle:** All three sides are equal, so the perimeter is three times one side.

**Step 1 — Write the perimeter formula:**

$$\text{Perimeter} = 3 \times \text{side}.$$

**Step 2 — Substitute the side length:**

$$3 \times 9.$$

**Step 3 — Compute:**

$$3 \times 9 = 27 \text{ cm}.$$

**Why other options are wrong:**

- Option A: 18 cm multiplies the side by 2 instead of 3.
- Option B: 21 cm has no valid basis for a side of 9.
- Option C: 24 cm uses a side of 8 cm.

**Final Answer:** Perimeter $= 3 \times 9 = 27$ cm $\Rightarrow$ $\boxed{\text{D}}$

**Answer: (D)** Go Back to Q24

## Q25.

### Solution

**Concept — Area of a Circle:** The radius is half the diameter, and area $= \pi r^2$.

**Step 1 — Find the radius from the diameter:**

$$r = \frac{28}{2} = 14 \text{ cm}.$$

**Step 2 — Square the radius:**

$$14^2 = 196.$$

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

$$\frac{22}{7} \times 196 = 22 \times 28.$$

**Step 4 — Compute:**

$$22 \times 28 = 616 \text{ cm}^2.$$

**Why other options are wrong:**

- Option A: 308 $\text{cm}^2$ halves the correct area.
- Option B: 154 $\text{cm}^2$ uses a radius of 7 (the diameter as radius).
- Option D: 462 $\text{cm}^2$ has no valid basis here.

**Final Answer:** Area $= \frac{22}{7} \times 14^2 = 616$ cm$^2$ $\Rightarrow$ C

**Answer: (C)** Go Back to Q25

## Q26.

**Solution**

**Concept — Perimeter of a Rectangle:** Perimeter $= 2 \times (\text{length} + \text{width})$.

**Step 1 — Add the length and the width:**

$$14 + 6 = 20.$$

**Step 2 — Multiply the sum by 2:**

$$2 \times 20 = 40 \text{ cm}.$$

**Why other options are wrong:**

- Option B: 20 cm is only the sum of length and width, not doubled.
- Option C: 84 cm is the area ($14 \times 6$), not the perimeter.
- Option D: 44 cm uses a wrong width.

**Final Answer:** Perimeter $= 2 \times (14 + 6) = 40$ cm $\Rightarrow$ A

**Answer: (A)** Go Back to Q26

## Q27.

**Solution**

**Concept — Volume of a Cylinder:** Volume $= \pi r^2 h$, where $r$ is the base radius and $h$ the height.

**Step 1 — Square the radius:**

$$7^2 = 49.$$

**Step 2 — Multiply by $\pi = \frac{22}{7}$:**

$$\frac{22}{7} \times 49 = 22 \times 7 = 154.$$

**Step 3 — Multiply by the height:**

$$154 \times 10 = 1540 \text{ cm}^3.$$

**Why other options are wrong:**

- Option A: 770 $\text{cm}^3$ uses a height of 5.
- Option C: 2200 $\text{cm}^3$ has no valid basis here.
- Option D: 1400 $\text{cm}^3$ drops the $\frac{22}{7}$ factor.

**Final Answer:** Volume $= \frac{22}{7} \times 7^2 \times 10 = 1540$ cm$^3$ $\Rightarrow$ $\boxed{\text{B}}$

**Answer: (B)** Go Back to Q27

## Q28.

**Solution**

**Concept — Permutations:** Fill each place of the number in turn; with no repetition, each choice reduces the digits left by one.

**Step 1 — Choices for the hundreds place:**

$$5 \text{ digits available.}$$

**Step 2 — Choices for the tens place (one digit used):**

$$4 \text{ digits available.}$$

**Step 3 — Choices for the units place (two digits used):**

$$3 \text{ digits available.}$$

**Step 4 — Multiply the choices:**

$$5 \times 4 \times 3 = 60.$$

**Why other options are wrong:**

- Option A: 125 is $5^3$, which allows repetition.
- Option B: 120 is $5!$, arranging all five digits.
- Option D: 10 counts unordered selections, not numbers.

**Final Answer:** Number of 3-digit numbers $= 5 \times 4 \times 3 = 60 \Rightarrow$ C

**Answer: (C)** Go Back to Q28

## Q29.

**Solution**

**Concept — Combinations:** A handshake is a choice of 2 people out of $n$, where order does not matter, so the count is $\binom{n}{2} = \dfrac{n(n-1)}{2}$.

**Step 1 — Substitute $n = 12$:**

$$\binom{12}{2} = \frac{12 \times 11}{2}.$$

**Step 2 — Multiply the numerator:**

$$12 \times 11 = 132.$$

**Step 3 — Divide by 2:**

$$\frac{132}{2} = 66.$$

**Why other options are wrong:**

- Option A: 144 is $12^2$, counting each person against everyone including themselves.
- Option B: 132 counts each handshake twice (ordered pairs).

- Option C: 72 has no valid basis here.

**Final Answer:** Number of handshakes $= \frac{12\times11}{2} = 66 \Rightarrow \boxed{\text{D}}$

**Answer: (D)** Go Back to Q29

## Q30.

### Solution

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

**Step 1 — Total number of cards:**

$$52 \text{ cards.}$$

**Step 2 — Number of kings in the pack:**

$$4 \text{ kings.}$$

**Step 3 — Form and simplify the ratio:**

$$\frac{4}{52} = \frac{1}{13}.$$

**Why other options are wrong:**

- Option A: $\frac{1}{4}$ is the probability of a particular suit, not a king.
- Option C: $\frac{1}{52}$ is the chance of one specific card.
- Option D: $\frac{4}{13}$ does not simplify from $\frac{4}{52}$.

**Final Answer:** $P(\text{king}) = \frac{4}{52} = \frac{1}{13} \Rightarrow \boxed{\text{B}}$

**Answer: (B)** Go Back to Q30

# Answer Key

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