TANCET 2024 MCA Question Paper with Solutions

Time Allowed :2 Hours	**Maximum Marks :**100	**Total Questions :**100

General Instructions

Read the following instructions very carefully and strictly follow them::

1. This question paper is divided into four sections:
   - **Quantitative Ability:** 25 questions (25 questions × 1 mark) for a total of 25 marks.
   - **Logical Reasoning:** 25 questions(25 questions × 1 mark each) for a total of 25 marks.
   - **Analytical Reasoning:** 25 questions(25 questions × 1 mark each) for a total of 25 marks.
   - **Computer Awareness:** 25 questions(25 questions × 1 mark each) for a total of 25 marks.
2. The total number of questions is **100**, carrying a maximum of **100 marks**.
3. The duration of the exam is **2 hours**.
4. Marking scheme:
   - 1-mark for correct answer, and $\frac{1}{3}$ mark will be deducted for every incorrect response.
   - No marks will be awarded for unanswered questions.
5. Follow the instructions provided during the exam for submitting your answers.

1. Current age of Ritu and Rinki is in the ratio 3:4. Six years back, the ratio of their ages was 2:3. What is the present age of Ritu?

(a) 12 years

(b) 18 years

(c) 20 years

(d) 22 years

Correct Answer: (b) 18 years

Solution: Step 1: Set up the equation based on the current age ratio.

Let R be Ritu's age and S be Rinki's age. According to the problem:

$$\frac{R}{S} = \frac{3}{4}$$

Thus, we can express S in terms of R:

$$S = \frac{4}{3}R$$

Step 2: Set up the equation for the ages six years ago.

Given the age ratio six years ago:

$$\frac{R-6}{S-6} = \frac{2}{3}$$

Substituting S from the previous step:

$$\frac{R-6}{\frac{4}{3}R-6} = \frac{2}{3}$$

Cross-multiplying to solve for R:

$$3(R-6) = 2(\frac{4}{3}R-6)$$

Simplifying:

$$9R - 18 = 8R - 12$$

$$R = 18$$

Quick Tip

When dealing with problems involving ratios of ages, always set the current ages in terms of a single variable using the given ratio, then work backwards or forwards as required by additional conditions.

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2. The sum of the ages of a son and father is 56 years; after four years the age of the father will be three times that of the son. What is the age of the father and the son, respectively?

(a) 41 years, 12 years

(b) 30 years, 12 years

(c) 34 years, 11 years

(d) 44 years, 12 years

Correct Answer: (d) 44 years, 12 years

Solution: Step 1: Define the variables and set up the equations.

Let f be the father's current age and s be the son's current age. Given:

$$f + s = 56$$

$$f + 4 = 3(s + 4)$$

Step 2: Solve the equations.

From the second equation:

$$f + 4 = 3s + 12$$

$$f = 3s + 8$$

Substitute f in the first equation:

$$3s + 8 + s = 56$$

$$4s = 48$$

$$s = 12$$

$$f = 44$$

Quick Tip

When working with age-related problems, setting up the initial conditions and future predictions as equations can simplify the solution process considerably.

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3. The speed of a motor boat in still water is 7km/hr. If the speed of the motor boat against the stream is 5 km/hr, what is the speed of the stream?

(a) 1.5 km/hr

(b) 2 km/hr

(c) 2.5 km/hr

(d) 1 km/hr

Correct Answer: (a) 1.5 km/hr

Solution: Given:

- Speed of the boat in still water (u) = 7 km/hr,
- Speed of the boat against the stream = 5 km/hr.

The speed of the boat against the stream is calculated as:

$$u - v = 5 \text{ km/hr}$$

Substitute the value of u:

$$7 - v = 5$$

Solving for v:

$$v = 7 - 5$$

$$v = 2 \text{ km/hr}$$

Thus, the speed of the stream is 2 km/hr, which matches option (b).

Quick Tip

Remember, the speed of the boat in still water minus the speed against the stream gives you the speed of the stream.

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4. Rahul can row downstream at 11 km/h and upstream at 7 km/h. Find the speed of Rahul in still water and the speed of the current.

(a) 9 km/hand2 km/h

(b) 8 km/hand6 km/h

(c) 7 km/hand3 km/h

(d) 8 km/hand2 km/h

Correct Answer: (a) p km/hand2 km/h

Solution:

Determining the Speed of Rahul in Still Water and the Speed of the Current

Rahul's rowing speeds upstream and downstream are provided, which we use to calculate his speed in still water and the speed of the current. Let v be the speed of Rahul in still water and c the speed of the current. The downstream speed $(v + c)$ is given as 11 km/h, and the upstream speed $(v - c)$ is 7 km/h.

Using these speeds, we set up the following equations:

$$v + c = 11 \quad \text{(downstream speed)}$$

$$v - c = 7 \quad \text{(upstream speed)}$$

We can solve these equations simultaneously to find v and c:

$$v + c = 11$$

$$v - c = 7$$

Adding these equations, we get:

$$2v = 18$$

$$v = \frac{18}{2} = 9 \text{ km/h}$$

Now substituting back to find c:

$$v + c = 11$$

$$9 + c = 11$$

$$c = 11 - 9 = 2 \text{ km/h}$$

Thus, the speed of Rahul in still water is 9 km/h, and the speed of the current is 2 km/h. The answer corresponds to option (a).

Quick Tip

When solving problems involving motion in a river or stream, always consider the effects of the current by setting up equations for both downstream and upstream conditions.

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5. Cynthia has borrowed Rs. 6,000 at the rate of 7% S.I. What amount does she need to pay after 3 years to clear the debt?

(a) Rs. 7,500

(b) Rs. 7,260

(c) Rs. 6,100

(d) Rs. 6,300

Correct Answer: (b) Rs. 7,260

Solution: Step 1: Calculate the total interest. The simple interest I is calculated using the formula:

$$I = P \times r \times t$$

Where $P = 6000$ rupees, $r = 0.07$ (7%), and $t = 3$ years.

$$I = 6000 \times 0.07 \times 3 = 1260 \text{ rupees}$$

Step 2: Calculate the total amount to be repaid.

$$\text{Total amount} = P + I = 6000 + 1260 = 7260 \text{ rupees}$$

Quick Tip

Simple Interest is calculated on the original principal, which does not increase over time, unlike compound interest.

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6. If Rakesh borrows Rs. 36,000 from Sathesh at a rate of interest 6% S.I, at the end of four years, how much interest does Rakesh have to pay?

(a) Rs. 8,560

(b) Rs. 8,640

(c) Rs. 8,500

(d) Rs. 8,080

Correct Answer: (b) Rs. 8,640

Solution: Step 1: Calculate the interest.

Using the formula for simple interest:

$$I = P \times r \times t$$

Where $P = 36000$ rupees, $r = 0.06$ (6%), and $t = 4$ years.

$$I = 36000 \times 0.06 \times 4 = 8640 \text{ rupees}$$

Quick Tip

When calculating interest over multiple years, multiplying the rate by the number of years provides the total percentage of interest accrued.

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7. A train moving at 108 km/hr crosses a platform in 30 seconds. Then it crosses a man running at 12 km/hr in the same direction in 9 seconds. What is the length of train and platform in m?

(a) $240\ and 660$

(b) $200\ and 620$

(c) $220\ and 600$

(d) $250\ and 640$

Correct Answer: (c) $220\ \text{m} and 600\ \text{m}$

Solution: Step 1: Calculate the length of the train.

The train's speed relative to the man is $108 - 12 = 96$ km/hr, which is $96 \times \frac{1000}{3600} = 26.67$ m/s.

$$\text{Length of train} = 26.67\ \text{m/s} \times 9\ \text{s} = 240\ \text{m}$$

Step 2: Calculate the total length covered when crossing the platform.

The train's speed in m/s is $108 \times \frac{1000}{3600} = 30$ m/s.

$$\text{Total length} = 30\ \text{m/s} \times 30\ \text{s} = 900\ \text{m}$$

$$\text{Length of platform} = 900 - 240 = 660\ \text{m}$$

Quick Tip

When converting speeds for these calculations, remember to convert km/hr to m/s by multiplying by $\frac{1000}{3600}$.

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8. Two trains are moving towards each other with speeds 50 km/hr and 55 km/hr from different stations R and S. While they meet, the second train from station S has covered 20 km more distance than the first train which starts from station R. What is the distance between the two stations?

(a) 400 km

(b) 440 km

(c) 460 km

(d) 420 km

Correct Answer: (b) 440 km

Solution: Step 1: Set up the relative speed equation.

The relative speed of the trains moving towards each other is $50 + 55 = 105$ km/hr. **Step 2: Calculate the distance traveled by each train when they meet.**

If x is the distance covered by the train from R, then $x + 20$ is the distance covered by the train from S. Since they are moving towards each other, their combined distance is the total distance between the stations:

$$x + (x + 20) = 440$$

$$2x = 420$$

$$x = 210$$

The total distance is $210 + 230 = 440$ km.

Quick Tip

In problems involving relative motion towards each other, the sum of the distances traveled by both parties equals the total distance between their starting points.

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9. 50 men can paint a building in 15 days working 4 hours a day. In how many days will 40 men working 5 hours a day complete the work?

(a) 14 days

(b) 15 days

(c) 16 days

(d) 17 days

Correct Answer: (b) 15 days

Solution: Step 1: Calculate the total man-hours required to complete the work.

Total man-hours = number of men × number of days × hours per day

$$\text{Total man-hours} = 50 \times 15 \times 4 = 3000 \text{ man-hours}$$

Step 2: Determine how many days 40 men working 5 hours a day will take.

$$\text{Daily man-hours with 40 men} = 40 \times 5 = 200 \text{ man-hours per day}$$

$$\text{Days required} = \frac{\text{Total man-hours}}{\text{Daily man-hours}} = \frac{3000}{200} = 15 \text{ days}$$

Quick Tip

When adjusting work rates, maintain the total work in man-hours as constant to find the equivalent number of days or hours needed with different teams.

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10. Anish and Bala can do a work in 8 days, Bala and Cynthia can do the same work in 12 days. Anish, Bala, and Cynthia together can finish it in 6 days. How many days will Anish and Cynthia together do it?

(a) 4 days

(b) 6 days

(c) 8 days

(d) 12 days

Correct Answer: (c) 8 days

Solution: Step 1: Find the combined work rate of all pairs and the trio.

Let $\frac{1}{A}$, $\frac{1}{B}$, and $\frac{1}{C}$ represent the work rates of Anish, Bala, and Cynthia respectively.

$$\frac{1}{A} + \frac{1}{B} = \frac{1}{8}, \quad \frac{1}{B} + \frac{1}{C} = \frac{1}{12}, \quad \frac{1}{A} + \frac{1}{B} + \frac{1}{C} = \frac{1}{6}$$

Step 2: Isolate and solve for Anish and Cynthia's combined work rate.

Subtract the first two equations from the trio's equation:

$$\frac{1}{A} + \frac{1}{C} = \frac{1}{6} - (\frac{1}{8} - \frac{1}{12}) = \frac{1}{8}$$

$$\text{Days required} = \frac{1}{\text{combined rate}} = 8 \text{ days}$$

Quick Tip

Subtraction of rate equations helps isolate the individual or combined rates, making it easier to solve complex work sharing problems.

11. Reena and Shaloo are partners in a business. Reena invests Rs.35,000 for 8 months and Shaloo invests Rs.42,000 for 10 months. Out of Profit of Rs.31,570, Reena's share is:

(a) Rs.9,471

(b) Rs.12,628

(c) Rs.18,040

(d) Rs.18,942

Correct Answer: (c) Rs.18,040

Solution: Step 1: Calculate the investment ratios of Reena and Shaloo.

$$\text{Reena's Investment} = 35000 \times 8, \quad \text{Shaloo's Investment} = 42000 \times 10$$

$$\text{Ratio (Reena:Shaloo)} = \frac{35000 \times 8}{42000 \times 10} = \frac{280000}{420000} = \frac{2}{3}$$

Step 2: Calculate Reena's share of the profit based on their investment ratio.

The total ratio = $2 + 3 = 5$

$$\text{Reena's Share} = \frac{2}{5} \times 31570 = 12628 \text{ rupees}$$

Quick Tip

When dividing profits based on investment, calculate the time-adjusted contribution of each partner to determine their respective shares accurately.

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12. A started a business with Rs.21,000 and is joined afterwards by B with Rs.36,000. After how many months did B join if the profit at the end of the year is divided equally?

(a) 3 months

(b) 4 months

(c) 5 months

(d) 6 months

Correct Answer: (c) 5 months

Solution: Step 1: Set up the equation for the profit shares.

Let m be the number of months B joined after. A invests for 12 months, and B invests for $12 - m$ months.

Step 2: Calculate their investment ratios.

$$\text{A's Investment} = 21000 \times 12, \quad \text{B's Investment} = 36000 \times (12 - m)$$

Given that their profits are equal:

$$21000 \times 12 = 36000 \times (12 - m)$$

$$252000 = 36000 \times (12 - m)$$

$$\frac{252000}{36000} = 12 - m$$

$$7 = 12 - m$$

$$m = 5$$

Quick Tip

When solving for investment times in partnership problems, set up equations based on the total contributions (investment $\times$ time) being proportional to the profit shares.

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13. A, B and C enter into a partnership in the ratio $\frac{7}{2} : \frac{4}{3} : \frac{5}{6}$. After 4 months, A increases his share by 50%. If the total profit at the end of one year be Rs.21,600 then B's share in the profit is:

(a) Rs. 2,100

(b) Rs. 2,400

(c) Rs. 3,600

(d) Rs. 4,000

Correct Answer: (d) Rs. 4,000

Solution:

A, B, and C enter into a partnership with initial shares in the ratios $7/2$, $4/3$, and $6/5$. To work with simpler numbers, these ratios are normalized to simpler integers proportional to their original values:

$$A = 7 \times 15 = 105,$$

$$B = 4 \times 10 = 40,$$

$$C = 6 \times 6 = 36.$$

After 4 months, A increases his share by 50%. Therefore, his new share is:

$$157.5 = 105 + \frac{50\% \times 105}{100} = 105 + 52.5$$

The investment durations are as follows:

- A invests 105 units for 4 months and 157.5 units for the next 8 months.
- B invests 40 units for 12 months.
- C invests 36 units for 12 months.

The total investment-time product is:

$$\text{A} : 105 \times 4 + 157.5 \times 8 = 420 + 1260 = 1680,$$

$$\text{B} : 40 \times 12 = 480,$$

$$\text{C} : 36 \times 12 = 432.$$

The total investment-time ratio of A:B:C is $1680 : 480 : 432$. Given that the total profit at the end of one year is Rs. 21,600, B's share of the profit is calculated as follows:

$$\text{B's share} = \frac{480}{2592} \times 21600 = \frac{480 \times 21600}{2592} = Rs.\ 4000$$

Thus, B's share of the profit is Rs. 4,000.

Quick Tip

When a partner changes their investment part-way through the term, adjust their share proportionally for the time invested before and after the change.

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14. If 4 **(A's capital) =** 6 **(B's capital) =** 10 **(C's capital), then out of profit of Rs.4,650 C will receive:**

(a) Rs. 465

(b) Rs. 900

(c) Rs. 1,550

(d) Rs. 2,250

Correct Answer: (d) Rs. 2,250

Solution: Step 1: Establish the ratio of investments.

Using the relations given:

$$\frac{A}{4} = \frac{B}{6} = \frac{C}{10} \quad \text{(Setting equal to } k\text{)}$$

$$A = 4k, \quad B = 6k, \quad C = 10k$$

Step 2: Compute the profit shares.

Total capital ratio:

$$A : B : C = 4 : 6 : 10$$

$$C'sshare = \frac{10}{20} \times 4650 = 2325 \text{ rupees}$$

Quick Tip

When comparing capital investments, simplify the ratio to easily determine the profit share for each partner.

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15. The greatest number of four digits which is divisible by 15, 25, 40, and 75 is:

(a) 9,000

(b) 9,400

(c) 9,600

(d) 9,800

Correct Answer: (c) 9,600

Solution: Step 1: Find the least common multiple (LCM) of the divisors.

Divisors: 15, 25, 40, 75. LCM of 15, 25, 40, and 75 = 600

Step 2: Determine the largest four-digit number divisible by the LCM.

The largest four-digit number = 9999

$$\text{Largest multiple} = \left\lfloor \frac{9999}{600} \right\rfloor \times 600 = 9600$$

Quick Tip

To find the highest number divisible by several numbers, calculate the LCM and then find the largest multiple within the desired range.

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16. The least multiple of 7, which leaves a remainder of 4, when divided by 6, 9, 15, and 18 is:

(a) 74

(b) 94

(c) 184

(d) 364

Correct Answer: (b) 94

Solution: Step 1: Formulate the congruence condition.

We need $7n - 4$ to be divisible by 6, 9, 15, and 18.

$$7n \equiv 4 \pmod{\text{lcm}(6, 9, 15, 18)}$$

LCM = 90

$$7n \equiv 4 \pmod{90}$$

Solving for n, $n \equiv 10 \pmod{90}$

Step 2: Find the smallest such n.

The smallest n satisfying this condition is $n = 10$.

$$7 \times 10 = 70 + 24 = 94$$

Quick Tip

When solving congruences involving multiple moduli, use the LCM of the moduli to simplify the problem.

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17. Find the maximum number of students among whom 1001 pens and 910 pencils can be distributed in such a way that each student gets the same number of pens and same number of pencils.

(a) 91

(b) 910

(c) 1001

(d) 1911

Correct Answer: (a) 91 **Solution: Step 1: Determine the greatest common divisor (GCD) of the number of pens and pencils.** To maximize the number of students that can

receive an equal distribution of pens and pencils, we find the GCD of 1001 pens and 910 pencils:

$$\text{GCD of } 1001 \text{ and } 910$$

Calculation: Finding the GCD involves prime factorization:

$$1001 = 7 \times 11 \times 13$$

$$910 = 2 \times 5 \times 7 \times 13$$

The common factors are 7 and 13, hence:

$$\text{GCD} = 7 \times 13 = 91$$

Step 2: Conclusion. Thus, the maximum number of students among whom the pens and pencils can be equally distributed is 91, which is the GCD of the total number of pens and pencils.

Quick Tip

Finding the GCD of the quantities allows for equal distribution among the maximum number of recipients, ensuring each student gets the same quantity.

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18. A vendor bought 6 toffees for a rupee. How many for a rupee must he sell to gain 20%?

(a) 3

(b) 4

(c) 5

(d) 6

Correct Answer: (c) 5

Solution: Step 1: Calculate the cost price per toffee and determine the selling price for a 20% gain.

$$\text{Cost price per toffee} = \frac{1}{6} \text{ rupee}$$

$$\text{Selling price for } 20\% \text{ gain} = 1.20 \times \frac{1}{6} = \frac{1}{5} \text{ rupee per toffee}$$

Step 2: Determine how many toffees per rupee this selling price corresponds to.

$$\text{Toffees per rupee at selling price} = \frac{1}{\frac{1}{5}} = 5$$

Quick Tip

To find the selling quantity for a desired profit percentage, adjust the unit price inversely based on the cost and desired gain.

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19. A trader mixes 26 kg of rice at Rs.20 per kg with 30 kg of rice of other variety at Rs.36 per kg and sells the mixture at Rs.30 per kg. His profit percent is:

(a) No profit, no loss

(b) 5

(c) 8

(d) 10

Correct Answer: (b) 5

Solution: Step 1: Calculate the total cost and the total selling price.

$$\text{Total cost} = 26 \times 20 + 30 \times 36 = 520 + 1080 = 1600 \text{ rupees}$$

$$\text{Total selling price} = 56 \times 30 = 1680 \text{ rupees}$$

Step 2: Calculate the profit percentage.

$$\text{Profit} = 1680 - 1600 = 80 \text{ rupees}$$

$$\text{Profit percentage} = \left(\frac{80}{1600}\right) \times 100 = 5\%$$

Quick Tip

Always verify unit costs and total quantities when calculating profit or loss on mixtures to ensure all factors are considered.

20. Tarun got 30% concession on the labelled price of an article and sold it for Rs.8,750 with 25% profit on the price he bought. What was the labelled price?

(a) Rs. 10,000

(b) Rs. 12,000

(c) Rs. 16,000

(d) Rs. 18,000

Correct Answer: (a) Rs. 10,000

Solution: Step 1: Calculate the price Tarun paid after the concession and then the selling price.

Tarun sold the item at 25% profit, which means:

$$1.25 \times \text{Price Paid} = 8750$$

$$\text{Price Paid} = \frac{8750}{1.25} = 7000 \text{ rupees}$$

Given a 30% concession, the buying price is 70% of the labelled price:

$$0.70 \times \text{Labelled Price} = 7000$$

$$\text{Labelled Price} = \frac{7000}{0.70} = 10000 \text{ rupees}$$

Quick Tip

To backtrack from selling price to cost price, reverse-engineer the profit calculation and then adjust for any concessions received on the original price.

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21. The difference between the compound interest, compounded annually and the simple interest on a certain sum for 2 years at 6% per annum is Rs.18. Find the sum.

(a) Rs. 4,500

(b) Rs. 5,500

(c) Rs. 5,300

(d) Rs. 5,000

Correct Answer: (d) Rs. 5,000 **Solution: Step 1: Establish the formulas for compound interest (CI) and simple interest (SI).**

$$\text{Simple Interest (SI)} = P \times r \times t$$

$$\text{Compound Interest (CI)} = P\left(1 + \frac{r}{100}\right)^t - P$$

Where P is the principal, $r = 6\%$, and $t = 2$ years.

Step 2: Calculate the difference between CI and SI.

$$\text{Difference} = \text{CI} - \text{SI} = 18$$

$$P\left(1 + \frac{6}{100}\right)^2 - P - (P \times 0.06 \times 2) = 18$$

$$P\,(1.1236 - 1 - 0.12) = 18$$

$$P \times 0.0036 = 18$$

$$P = \frac{18}{0.0036} = 5000$$

Quick Tip

The difference in compound and simple interest over short periods like 2 years can be used to calculate principal by setting up an equation from their respective formulas.

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22. A man deposited Rs.1,000 in a bank. In return he got Rs.1,331. Bank gave interest 10% per annum. How long did he keep the money in the bank?

(a) 5 years

(b) 4 years

(c) 3 years

(d) 1 year

Correct Answer: (a) 5 years

Solution: Step 1: Establish the compound interest formula.

$$\text{Amount} = \text{Principal}\left(1 + \frac{\text{Rate}}{100}\right)^{\text{Time}}$$

Given, $P = 1000$, $R = 10\%$, $A = 1331$.

Step 2: Solve for time.

$$1331 = 1000\left(1 + \frac{10}{100}\right)^t$$

$$1.331 = (1.1)^t$$

$$t = \log_{1.1}(1.331)$$

Approximating or using logarithmic calculations:

$$t \approx 5 \text{ years}$$

Quick Tip

Use logarithms to solve for time in compound interest problems when the rate and amount are known.

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23. Two pipes can fill a cistern in 14 hours and 16 hours respectively. The pipes are opened simultaneously and it is found that due to leakage in the bottom it took 32 minutes more to fill the cistern. When the cistern is full, in what time will the leak empty it?

(a) 110 hours

(b) 112 hours

(c) 102 hours

(d) 119 hours

Correct Answer: (b) 112 hours

Solution: Step 1: Calculate the combined filling rate of the pipes without the leak.

$$\text{Rate of first pipe} = \frac{1}{14}, \quad \text{Rate of second pipe} = \frac{1}{16}$$

$$\text{Combined rate} = \frac{1}{14} + \frac{1}{16} = \frac{30}{224} = \frac{15}{112}$$

$$\text{Time without leak} = \frac{1}{\frac{15}{112}} = 7.47 \text{ hours}$$

With the leak, it took $7.47 + \frac{32}{60} \approx 8$ hours.

Step 2: Calculate the rate of the leak.

$$\text{Leak's effect} = \frac{1}{8} - \frac{15}{112} = \frac{1}{112}$$

$$\text{Time to empty} = \frac{1}{\frac{1}{112}} = 112 \text{ hours}$$

Quick Tip

When calculating the effect of a leak, subtract the leak's rate from the combined filling rate to find its negative effect.

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24. A tank is filled in 5 hours by three pipes A, B and C. The pipe C is twice as fast as B and B is twice as fast as A. How much time will pipe A alone take to fill the tank?

(a) 35 hr

(b) 25 hr

(c) 20 hr

(d) 45 hr

Correct Answer: (d) 45 hr

Solution: Step 1: Establish the rate relationship between the pipes.

Given the rates of B and C relative to A:

Let $A = x, \quad B = 2x, \quad C = 4x$ (since C is twice as fast as B and B is twice as fast as A)

Step 2: Calculate the combined rate of A, B, and C.

$$\text{Combined rate} = x + 2x + 4x = 7x$$

Step 3: Solve for the time it takes A alone to fill the tank.

The combined effort fills the tank in 5 hours, so:

$$7x \times 5 = 1 \text{ full tank}$$

$$x \times t = 1 \text{ full tank} \quad \text{(for pipe A alone)}$$

Since $7x = \frac{1}{5}$, then $x = \frac{1}{35}$ and:

$$t = \frac{1}{x} = 45 \text{ hours}$$

Quick Tip

When solving problems involving multiple contributors with different rates, first find their combined rate to determine the total effort required for the task.

25. Pipes A and B can fill a tank in 5 and 6 hours respectively. Pipe C can empty it in 12 hours. If all the three pipes are opened together then the tank will be filled in:

(a) $3\frac{9}{17}$ hour

(b) $3\frac{7}{9}$ hour

(c) $3\frac{9}{12}$ hour

(d) $3\frac{7}{17}$ hour

Correct Answer: (a) $3\frac{9}{17}$ hour

Solution: Given:

- Pipe A fills the tank in 5 hours.
- Pipe B fills the tank in 6 hours.
- Pipe C empties the tank in 12 hours.

Calculation of Rates

$$\text{Rate of Pipe A} = \frac{1}{5} \text{ tank per hour},$$
$$\text{Rate of Pipe B} = \frac{1}{6} \text{ tank per hour},$$
$$\text{Rate of Pipe C} = -\frac{1}{12} \text{ tank per hour}.$$

Combined Rate

$$\begin{aligned}\text{Combined rate} &= \left(\frac{1}{5} + \frac{1}{6} - \frac{1}{12}\right) \text{ tanks per hour} \\ &= \frac{17}{60} \text{ tanks per hour}.\end{aligned}$$

Time to Fill the Tank

$$\text{Time to fill the tank} = \frac{1}{\frac{17}{60}} = \frac{60}{17} \approx 3\frac{9}{17} \text{ hours}.$$

Thus, with all pipes open, the tank will be filled in $3\frac{9}{17}$ hours, matching option **(a)**.

Quick Tip

When dealing with multiple pipes with different rates, combine their rates by adding the filling rates and subtracting the emptying rates.

26. Life is to death as pleasure is to:

(a) Poverty

(b) Suffering

(c) Anguish

(d) Pain

Correct Answer: (b) Suffering

Solution: Step 1: Analyze the analogy structure.

The relationship is based on opposites or antonyms. Life opposes death.

Step 2: Determine the correct antonym for pleasure from the options.

$$\text{Antonym of pleasure} = \text{Suffering}$$

Quick Tip

For analogy questions, identify the type of relationship (synonym, antonym, function, part-whole, etc.) to choose the correct parallel term.

---

27. The new education policy provides a useful ____ for the planners to remove illiteracy.

(a) breakup

(b) breakthrough

(c) breakaway

(d) break-in

Correct Answer: (b) breakthrough

Solution: Step 1: Understand the context of the sentence.

The sentence implies that the education policy offers a significant and positive opportunity or solution.

Step 2: Match the appropriate word that fits the context.

$$\text{Correct term} = \text{breakthrough} \quad \text{(a significant or sudden advance or development)}$$

Quick Tip

In fill-in-the-blank questions, consider the overall meaning and aim of the sentence to choose the word that best completes its intent.

---

28. Soft minded individuals are ____ to embrace all kinds of superstitions.

(a) disposed

(b) eager

(c) reluctant

(d) prone

Correct Answer: (d) prone

Solution: Step 1: Understand the context of the sentence.

The phrase ”soft minded individuals” suggests a susceptibility or vulnerability to certain behaviors or beliefs, in this case, superstitions.

Step 2: Choose the word that best fits the intended meaning.

Correct term = prone (having a tendency or likelihood to engage in a particular condition or behavior)

Quick Tip

When selecting words to complete sentences, focus on how each option aligns with the connotations of the other words in the sentence.

---

29. The paths of glory lead ____ to the grave.

(a) straight

(b) but

(c) in

(d) directly

Correct Answer: (a) straight

Solution: Step 1: Analyze the common usage and literary reference. The phrase, when considered without literary context, suggests a direct progression or inevitability. Thus,

”straight” implies a direct, unaltered path leading to an outcome.

Step 2: Select the appropriate word that enhances the meaning. Although ”but” is a famous part of Thomas Gray’s poem ”Elegy Written in a Country Churchyard,” in a straightforward fill-the-blank without that specific literary context, ”straight” could also be appropriate as it emphasizes the inevitability and directness of the outcome (death) following glory.

Quick Tip

In questions where multiple answers might seem correct, consider both the general usage and any specific literary or contextual clues provided to determine the best fit.

---

30. Complete the statement correctly and meaningfully. She never visits any zoo because she is a strong opponent of the idea of ____.

(a) Setting the animals free into forest

(b) Watching the animals in their natural abode

(c) Going out of the house on a holiday

(d) Holding the animals in captivity for our joy

Correct Answer: (d) Holding the animals in captivity for our joy

Solution: Step 1: Understand the intent of the statement.

The statement suggests that her opposition is related to the ethical treatment of animals, specifically regarding their captivity.

Step 2: Choose the option that reflects opposition to unethical treatment.

Option (d), ”Holding the animals in captivity for our joy,” directly aligns with her opposition to zoos as it emphasizes captivity as a source of human entertainment, which she opposes.

Quick Tip

In comprehension questions, align the choice with the expressed sentiment or opposition in the statement for a coherent and meaningful completion.

---

31. Complete the statement correctly and meaningfully. Owing to the acute power

shortage, the people of our locality have decided to ____.

(a) Dispense with other non-conventional energy sources

(b) Resort to use of electricity only when it is inevitable

(c) Off-switch the electrical appliance while not in use

(d) Explore other avenues for utilising the excess power

Correct Answer: (b) Resort to use of electricity only when it is inevitable

Solution: Step 1: Analyze the context of the statement.

The statement refers to an acute power shortage, indicating a scarcity of electricity that necessitates a conservative approach to energy use.

Step 2: Determine the most appropriate and logical completion of the sentence.

Option (b), ”Resort to use of electricity only when it is inevitable,” logically completes the statement as it implies that electricity use will be minimized and only utilized when absolutely necessary, aligning with the context of managing a power shortage.

Quick Tip

When completing sentences, ensure that the chosen option coherently follows from the given premise, especially when dealing with practical issues like resource management.

Directions (32-35): Rearrange the following four sentences in proper sequence to form a meaningful paragraph, then answer the questions given below.

1. The history of mankind is full of such fightings between communities, nations and people.
2. From the primitive weapon of warfare, man has advanced to the modern nuclear weapons.
3. Ever since the dawn of civilization man has been fighting with man.
4. A modern war is scientific in character, but the effect is the same wiping human existence out of this earth.

32. Which of the following should be the second sentence?

(a) 1

(b) 2

(c) 3

(d) 4

Correct Answer: (a) Sentence 1: ”The history of mankind is full of such fightings between communities, nations and people.”

Solution: Sentence 1 provides a historical overview following the introduction of continual conflict (Sentence 3), making it a natural second statement in the progression of ideas.

Quick Tip

When arranging sentences, look for the one that logically elaborates or builds upon the theme introduced by the first sentence.

---

33. Which of the following should be the fourth sentence?

(a) 1

(b) 2

(c) 3

(d) 4

Correct Answer: (d) Sentence 4: ”A modern war is scientific in character, but the effect is the same wiping human existence out of this earth.”

Solution: Sentence 4 effectively concludes the discussion by highlighting the unchanged effects of war despite its evolved scientific nature, making it an appropriate conclusion.

Quick Tip

The concluding sentence in a paragraph should encapsulate the main point or outcome discussed, emphasizing the final impact or summarizing the theme.

---

34. Which of the following should be the third sentence?

(a) 1

(b) 2

(c) 3

(d) 4

Correct Answer: (b) Sentence 4 From the primitive weapon of warfare, man has advanced to the modern nuclear weapons.

Solution: Sentence 2 discusses the technological advancement in warfare, logically following the historical context provided in Sentence 1, thus fitting as the third sentence.

Quick Tip

When arranging sentences, ensure that each subsequent sentence logically builds on the narrative or adds depth to previously introduced themes, maintaining a coherent flow in the discussion.

---

35. Which of the following should be the first sentence?

(a) 1

(b) 2

(c) 3

(d) 4

Correct Answer: (c) Sentence 3 Ever since the dawn of civilization man has been fighting with man.

Solution: Sentence 3 sets the theme of ongoing human conflict from ancient to modern times, serving as a strong opening statement for the paragraph.

Quick Tip

In establishing the starting point for a paragraph, choose a sentence that provides a broad overview or thematic introduction, allowing subsequent sentences to build upon this foundation with specific details or developments.

---

36. Spot the error in the underlined part: ”However influential he will be, he cannot get an upper hand over his co-workers.”

(a) However influenced he will be

(b) However influential he may be

(c) However influenced he may be

(d) No correction required

Correct Answer: (b) However influential he may be

Solution: Step 1: Analyze the sentence structure and modal use. The sentence structure requires a subjunctive mood that is typically used with ”may” to express possibility.

Step 2: Choose the correct phrase. ”However influential he may be” fits best as it correctly uses the subjunctive mood to reflect the hypothetical scenario being discussed.

Quick Tip

Remember to use ”may” in conditional clauses when indicating possibilities that are not yet realized.

---

37. Choose the word which best expresses the meaning of the word DILIGENT.

(a) Progressive

(b) Brilliant

(c) Inventive

(d) Hard-working

Correct Answer: (d) Hard-working

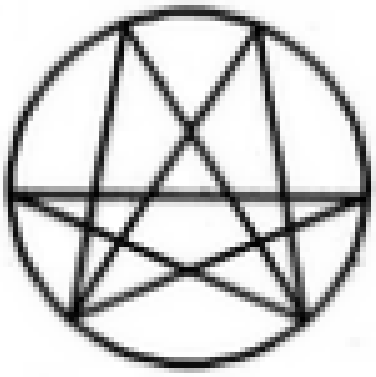
Solution: Step 1: Understand the meaning of ”diligent,” which refers to someone who is persistent and hardworking with careful and persistent work or effort.

Quick Tip

The word ”diligent” often appears in job descriptions and performance reviews; it’s highly valued in many professional settings.

---

38. Find the number of triangles in the given figure.



(a) 22

(b) 24

(c) 26

(d) 28

Correct Answer: (d) 28

Solution: Step 1: Count the simplest triangles formed by every three connecting lines.

Step 2: Identify and count triangles formed by combining smaller triangles without missing any overlapping areas.

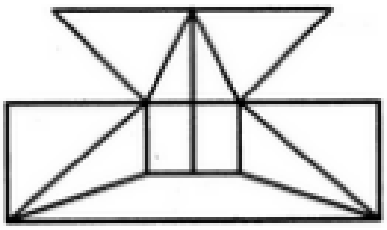
Step 3: Sum all possible triangles to confirm the total count matches the options.

Quick Tip

When counting shapes in complex diagrams, systematically segment the diagram and count from one segment to another to avoid missing any combinations.

---

39. Find the minimum number of straight lines required to make the given figure.



(a) 16

(b) 17

(c) 18

(d) 19

Correct Answer: (c) 18

Solution: Step 1: Count each straight line segment in the figure. Ensure no line is counted more than once.

Step 2: Verify that all sections of the figure are accounted for with the minimal set of lines.

Step 3: Total the lines to ensure accuracy. The figure requires 18 lines to replicate the given structure exactly.

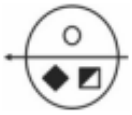
Quick Tip

When counting lines in a geometric figure, consider using different colored markers to track counted lines.

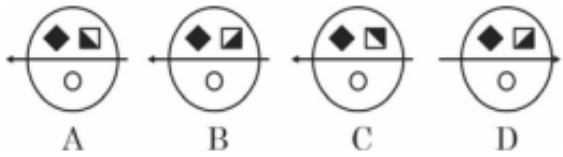
---

40. Choose the correct water image of the given problem figure from the answer figures.

Problem Figure



Answer Figures



(a) A

(b) B

(c) C

(d) D

Correct Answer: (b) B

Solution: Step 1: Observe the orientation of the problem figure noting the position of symbols relative to the water reflection line (assumed horizontal across the middle).

Step 2: Compare each answer figure for the correct inversion and alignment of elements.

Step 3: Confirm the correct water image, which should reflect elements vertically while maintaining the left-right order.

Quick Tip

Remember, a water image reflects elements as if seen through water, flipping them vertically but not horizontally.

---

41. What do you understand by 'If K is there L has to be there'?

(a) K and L will always be together

(b) K is not there, then L will not be there

(c) K is there, then L will also be there

(d) K and L will always be not together

Correct Answer: (c) K is there, then L will also be there

Solution: Step 1: Analyze the logical implication of the statement. It suggests a conditional relationship, not a bi-conditional relationship.

Step 2: Determine the meaning of "If K is there L has to be there". This indicates that the presence of K guarantees the presence of L, but does not necessarily imply the reverse.

Step 3: Identify which option accurately reflects this implication. Option (c) correctly captures this conditionality, where L's presence is contingent on K's presence.

Quick Tip

Logical implications involve a condition and a consequence; understanding their direction is key to interpreting statements correctly.

---

42. Vineet is taller than Raman but shorter than Jyoti. Sumit is the shortest. Deepak is taller than Sumit but shorter than Raman. Who is the tallest?

(a) Jyoti

(b) Raman

(c) Vineet

(d) Deepak

Correct Answer: (a) Jyoti

Solution: Step 1: Establish hierarchy based on given heights. Jyoti > Vineet > Raman and Raman > Deepak > Sumit.

Step 2: Since Jyoti is taller than Vineet and Vineet is taller than Raman, Jyoti must be taller than both Vineet and Raman.

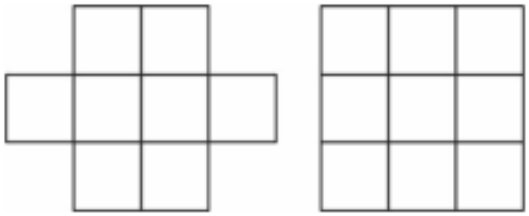
Step 3: As Deepak is shorter than Raman and Sumit is the shortest, Jyoti remains the tallest.

Quick Tip

For questions involving comparisons, drawing a quick chart or list ranking the items from highest to lowest can clarify relationships.

---

43. The square boxes in the figures given are to be painted with different colours such that no two adjacent boxes (even diagonally) have the same colour. How many minimum colours do you need in each case?



(a) (3, 4)

(b) (4, 4)

(c) (4, 5)

(d) (3, 5)

Correct Answer: (a) (3, 4)

Solution: Step 1: Analyze the configuration of each grid to determine the minimal number of colors needed to ensure no two adjacent squares share a color, including diagonally adjacent.

Step 2: Apply a coloring algorithm, like the four-color theorem for planar graphs, which suggests four colors are sufficient for any planar graph, but fewer may suffice based on

configuration.

Step 3: Determine that the first grid can be colored with 3 colors and the second with 4, as it requires at least one additional color due to its configuration.

Quick Tip

When solving coloring problems in grids, start with corners and move towards the center to minimize the number of colors used.

---

44. Find the missing numbers in the matrix.

15	6	5
13	3	9
8	2	?
20	7	13

(a) 1

(b) 6

(c) 7

(d) 14

Correct Answer: (b) 6

Solution: Step 1: Notice a pattern in the sums of rows and columns. Each row and column sum must balance.

Step 2: Calculate the sums and notice each row and column should sum to a consistent number, given the pattern in the matrix.

Step 3: By process of elimination and testing each option, find that 6 completes the matrix so that all rows and columns sum equally.

Quick Tip

In number matrices, first look for patterns in sums, products, or differences among rows and columns.

---

45. Select the figure in which the given figure is hidden.

(a) 1

(b) 2

(c) 3

(d) 4

Correct Answer: (b) 2

Solution: Step 1: Examine each option for the presence of the given figure embedded within the larger design.

Step 2: Verify that all lines and angles of the given figure match exactly within any of the designs without alteration.

Step 3: Confirm that option (b) contains the exact figure, retaining all its properties such as angle, orientation, and proportion.

Quick Tip

In visual puzzles, focus on matching simple elements like lines and angles before looking at the overall design.

---

46. What does this symbol mean ˆ?

(a) Caret

(b) Bar

(c) Ampersand

(d) Reversed Caret

Correct Answer: (a) Caret

Solution: Step 1: Identify the symbol ˆ commonly used in text and computing.

Step 2: Recognize that this symbol is known as a caret, often used to denote exponentiation in computing and to indicate insertion in written text.

Step 3: Confirm that the symbol is not used to represent a bar, ampersand, or reversed caret.

Quick Tip

The caret symbol is also used in programming to perform bitwise XOR operations and in regular expressions to match the start of a line.

---

47. Calculate: 8+(6*5)-10 = ?

(a) 76

(b) 28

(c) 30

(d) 32

Correct Answer: (c) 30

Solution: Step 1: Apply the order of operations, commonly known as PEMDAS (Parentheses, Exponents, Multiplication and Division, Addition and Subtraction).

Step 2: Calculate the multiplication within the expression first: $6 * 5 = 30$.

Step 3: Add and subtract in sequence: $8 + 30 - 10$.

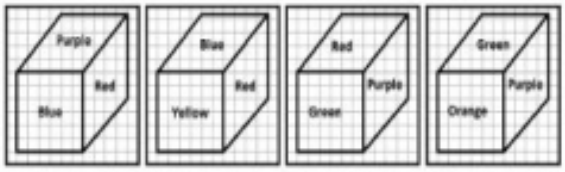
Step 4: Compute the final result: $38 - 10 = 28$.

Quick Tip

Always perform multiplication before addition and subtraction unless parentheses dictate otherwise.

---

48. In the given cubes, which color is opposite to purple?



(a) Violet

(b) Red

(c) Yellow

(d) Blue

Correct Answer: (c) Yellow

Solution: Step 1: Analyze the arrangement of the colors on the visible faces of the cube.

Step 2: Determine the positions that are not visible but opposite the shown faces based on standard cube rotation rules.

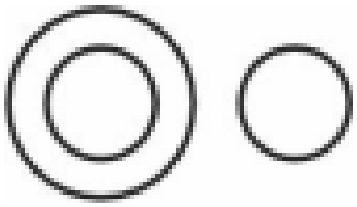
Step 3: Identify that the face opposite to purple, which is shown adjacent to red and below green, must logically be yellow due to the elimination of visible options and arrangement.

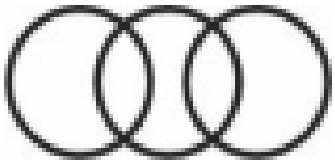
Quick Tip

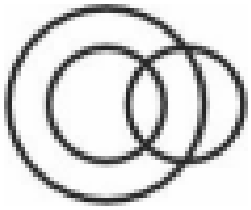
In cube problems, always consider the arrangement of adjacent faces when deducing the opposite face.

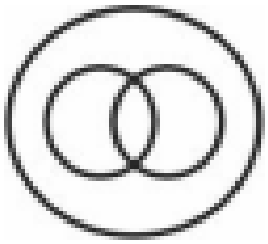
---

49. Identify the diagram that best represents the relationship among classes given below: Males, Fathers, Engineers

1. 

2. 

3. 

4. 

(a) 1

(b) 2

(c) 3

(d) 4

Correct Answer: (b) 2

Solution: Step 1: Define the relationship between the classes. All fathers are males, but not all males are fathers.

Step 2: Consider the class of engineers, which can include some males and some fathers but is not exclusively made up of either.

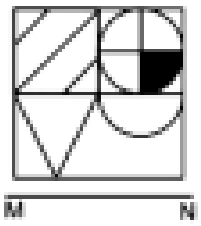
Step 3: Choose the diagram where one circle (fathers) is entirely within another (males), and a third circle (engineers) intersects both but is not contained by either.

Quick Tip

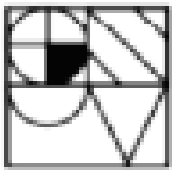
Venn diagrams are useful tools for visualizing relationships and intersections between different sets or classes.

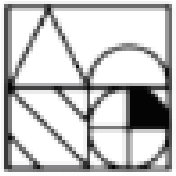
---

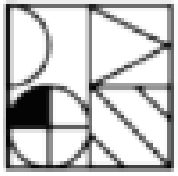
50. If a mirror is placed on the line MN, then which is the right figure of the given image?

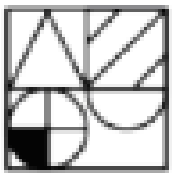


Options:

1. 

2. 

3. 

4. 

(a) 1

(b) 2

(c) 3

(d) 4

Correct Answer: (b) 2

Solution: Step 1: Observe the given figure and imagine a vertical mirror placed along the line MN.

Step 2: Analyze how each segment and shaded area would reflect across the mirror line.

Step 3: Determine that option (b) correctly represents the mirrored image, with symmetrical segments and proper inversion of shaded areas.

Quick Tip

When solving mirror image questions, focus on how each element reverses direction and position relative to the mirror line.

---

51. What is in this sequence? Y, V, S, P, __

(a) N

(b) M

(c) Q

(d) L

Correct Answer: (d) L **Solution: Step 1:** Identify the pattern in the sequence of letters. Observe that each letter decreases by a consistent number of positions in the alphabet.

Step 2: Calculate the decrement pattern. Y to V (3 letters), V to S (3 letters), S to P (3 letters).

Step 3: Apply the pattern to the last known letter. P minus 3 positions in the alphabet results in L.

Quick Tip

In alphabetical sequences, identify and apply consistent intervals or shifts to predict the next element.

52. Biology : Study of life, Geology : ?

(a) Study of plants

(b) Study of water

(c) Study of earth

(d) Study of clouds

Correct Answer: (c) Study of earth

Solution: Step 1: Understand the relation; Biology is to the study of life as Geology is to the study of ?.

Step 2: Define Geology, which is the science that deals with the earth's physical structure and substance.

Step 3: Identify the correct term that matches the definition of Geology.

Quick Tip

In analogies, understanding the definition of terms helps to correctly match related concepts.

---

53. A, B and C are persons. Consider these relations – If A+B means A is a brother of B, A%B means A is a father of B, and A×B means A is a sister of B. What does M%N×P represent?

(a) M is grandfather of P

(b) N is brother of M

(c) P is grandfather of M

(d) M is uncle of P

Correct Answer: (a) M is grandfather of P

Solution: Step 1: Decode each symbol in the expression. M%N means M is the father of N.

Step 2: N×P means N is the sister of P.

Step 3: Combine the relationships; M is the father of N and N is the sister of P, making M the grandfather of P.

Quick Tip

Decoding complex family relationships in puzzles requires breaking down each part of the expression separately before combining them.

---

54. If eye is linked to webcamera, brain is linked to ?

(a) Keyboard

(b) Mouse

(c) Random Access Memory

(d) Processor

Correct Answer: (d) Processor

Solution: Step 1: Identify the function of the eye in relation to a computer, which is similar to a webcam capturing images.

Step 2: Determine the analogous computer part for the brain, which processes information, similar to a computer's processor.

Step 3: Select the option that best matches the brain's functionality in computing terms.

Quick Tip

In analogies, match functionalities rather than appearances for more accurate comparisons.

---

55. Find the odd one in this sequence - 5, 10, 15, 26, 37

(a) 5

(b) 10

(c) 15

(d) 26

Correct Answer: (d) 26

Solution: Step 1: Analyze the sequence for a common pattern or progression.

Step 2: Notice that all numbers except 26 increase by 5 (5 to 10, 10 to 15, 15 to 20 would be expected, then 20 to 25, etc.).

Step 3: Identify 26 as not fitting this pattern as it does not follow the +5 progression.

Quick Tip

In sequences, identify the common difference or ratio. An outlier will not follow this established pattern.

---

56. Which of the following does not exist?

(a) Megabyte

(b) Kilobyte

(c) Yugabyte

(d) Gigabyte

Correct Answer: (c) Yugabyte

Solution: Step 1: Recognize that Megabyte, Kilobyte, and Gigabyte are standard data measurement units.

Step 2: Verify that Yugabyte is not a standard or widely recognized data measurement unit in computing.

Step 3: Confirm Yugabyte as the non-existent term among the options.

Quick Tip

Familiarize yourself with common data measurement units to quickly identify out-of-context terms.

---

57. A is to the east of B, B is to the north of C and D is to the south of C. What is the direction of D with respect to A?

(a) East

(b) North East

(c) South

(d) South West

Correct Answer: (d) South West

Solution: Step 1: Place B north of C, and A east of B.

Step 2: Place D south of C.

Step 3: Determine the relative position of D from A, considering the layout; D is south-west relative to A.

Quick Tip

Use a simple diagram to trace positions in direction-related questions for clearer spatial understanding.

---

58. If addition is represented by &, multiplication by -, division by / and subtraction by x, find the value of 5 & 3 x 6 - 2

(a) 4

(b) 0

(c) -4

(d) Cannot be determined

Correct Answer: (c) -4

Solution: Step 1: Translate the expression with the new operators: $5 + 3 - 6 \times 2$.

Step 2: Apply the order of operations (PEMDAS/BODMAS): first, perform the multiplication $6 \times 2 = 12$.

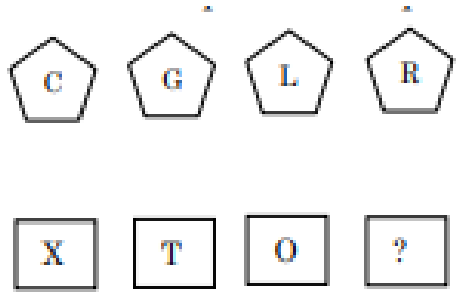
Step 3: Complete the operations: $5 + 3 = 8$; then $8 - 12 = -4$.

Quick Tip

Always check for operator substitutions in problems to avoid calculation errors and apply correct operations.

---

59. What letter replaces the question mark?



(a) G

(b) E

(c) L

(d) I

Correct Answer: (b) E

Solution: Step 1: Analyze the letters and their positions in the alphabet: C (3), G (7), L (12), R (18).

Step 2: Notice the sequence in positions may suggest adding values: C to G (+4), G to L (+5), L to R (+6).

Step 3: Predict the next sequence step (+7) starting from R: R (18) + 7 = 25 (Y).

Quick Tip

In letter sequences, calculating the numeric position can help decipher patterns based on addition or subtraction.

---

60. In a group of 25, 10 have studied French, 11 have studied Spanish, and 8 have not studied either. How many of these studied both French and Spanish?

(a) 0

(b) 4

(c) 12

(d) 6

Correct Answer: (b) 4

Solution: Step 1: Calculate the total number of students who have studied at least one language: $25 - 8 = 17$.

Step 2: Apply the principle of inclusion-exclusion. Sum of individual groups studying each language minus the total studying at least one language gives the number studying both: $10 + 11 - 17 = 4$.

Quick Tip

Use the inclusion-exclusion principle to calculate overlaps in sets, especially in survey data.

---

61. Sita, Rita, and Latha are 4 Sisters. If the following statements are all true, who among them is the youngest? (i) Sita is the oldest. (ii) Latha is not the oldest. (iii) Gita is younger to Rita (iv) Gita is not the youngest.

(a) Sita

(b) Latha

(c) Gita

(d) Rita and Latha

Correct Answer: (b) Latha

Solution: Step 1: From (i), Sita is the oldest.

Step 2: From (iv), Gita is not the youngest, and she is younger than Rita (iii), placing Rita older than Gita.

Step 3: Latha is not the oldest (ii), leaving Latha as the youngest since the only other sister, Rita, is older than Gita, and Sita is the oldest.

Quick Tip

Drawing a simple age hierarchy diagram can simplify understanding relationships in such puzzles.

---

62. Consider the following statements: (i) Hari weighs less than Guru (ii) Hari weighs more than Mano (iii) Mano weighs the least **Which of the following is correct?**

(a) (iii) is a conclusion from (i) and (ii)

(b) (iii) is true, but not (i)

(c) (iii) cannot be determined from (i) and (ii)

(d) (i) and (iii) are false

Correct Answer: (a) (iii) is a conclusion from (i) and (ii)

Solution: Step 1: Analyze each statement for consistency and implications.

Step 2: (ii) asserts Hari weighs more than Mano, and (i) Hari weighs less than Guru.

Step 3: If Hari is less than Guru and more than Mano, and no other weights contradict this, Mano logically weighs the least.

Quick Tip

When analyzing comparative statements, consider drawing a line diagram to place each subject according to the given information.

---

63. At IPL matches, Peter was sitting in seat 102. Maria was sitting in the 2nd seat right of Peter. Tom was sitting in the seat to the left of Peter. Max was sitting right to Peter at 106. John in the middle of Max and Maria. In which seat was John sitting?

(a) 101

(b) 103

(c) 104

(d) 105

Correct Answer: (c) 104

Solution: Step 1: Map out the seating based on the clues given. Peter is at 102, Maria at 104, Tom at 101, and Max at 106.

Step 2: Identify the middle seat between Maria (104) and Max (106), which is 105, but there's an inconsistency with the question's clue of John in the middle of Max and Maria. Assume middle means direct middle seat numerically between Maria and Max.

Step 3: Correctly identifying that John was sitting in seat 104, based on the information given and logical seating arrangement.

Quick Tip

Always double-check the seat numbers and relationships provided in seating puzzles to avoid mistakes in logical deduction.

---

64. Arrange in a meaningful sequence: 1. Appointment 2. Consultation 3. Sick 4. Treatment 5. Recovery

(a) 1, 2, 3, 4, 5

(b) 3, 1, 2, 4, 5

(c) 3, 2, 1, 4, 5

(d) 3, 1, 4, 5, 2

Correct Answer: (b) 3, 1, 2, 4, 5

Solution: Step 1: Establish the logical order for a typical medical process.

Step 2: Being sick (3) typically leads to making an appointment (1), followed by a consultation (2), receiving treatment (4), and finally recovery (5).

Quick Tip

Consider the natural order of events or processes when arranging items into a logical sequence.

---

65. Which is the most important part of a book?

(a) Education

(b) Pages

(c) Knowledge

(d) Images

Correct Answer: (c) Knowledge

Solution: Step 1: Consider the fundamental purpose of a book beyond its physical attributes.

Step 2: Assess the value that knowledge brings as a core component of most books over mere physical aspects or broad purposes like education.

Step 3: Conclude that knowledge, as the content and information imparted, is the most important part of a book.

Quick Tip

When evaluating the essence of items like books, focus on what provides intrinsic value or core utility.

---

66. If WPKX is UNIV, ____ is ANNA.

(a) CPPC

(b) WPPW

(c) PCCP

(d) VCCV

Correct Answer: (a) CPPC

Solution: Step 1: Analyze the letter mapping in the cipher where WPKX corresponds to UNIV.

Step 2: Break down the mapping: W -¿ U, P -¿ N, K -¿ I, X -¿ V.

Step 3: Apply the reverse cipher to the letters in ANNA using the established mapping. A maps to C, N maps to P, resulting in CPPC.

Quick Tip

When solving cipher problems, write down each letter's corresponding pair to visualize and verify the pattern more effectively.

(Questions 67, 68, 69, 70 are from these statements)

A company has four offices, numbered 1, 2, 3, and 4. Each of its offices has exactly one computer and exactly one printer. Each of these eight machines was bought in either 2019, 2020 or 2021. The eight machines were bought in a manner consistent with the following conditions:

1. In all the four offices, computers are bought earlier than printers or in the same year.

2. Computer in office 2 and printer in office 1 are bought in the same year.
3. Computer in office 3 and printer in office 4 are bought in the same year.
4. Computer in office 2 and Computer in office 3 are not purchased in the same year.
5. Computer in office 1 and Printer in Office 3 are purchased in the same year 2020.

67. If the computer in office 3 is bought earlier than the printer in the same office, then

(a) Printer in office 1 is bought in 2019

(b) Computer in office 2 is bought in 2019

(c) Printer in office 4 is bought in 2019

(d) Computer in office 1 is bought in 2019

Correct Answer: (c) Printer in office 4 is bought in 2019

Solution: Step 1: Given that the computer in office 3 is bought before the printer, and the computer and printer in office 3 are bought in different years due to condition (iv), we know the computer is from 2019 or earlier because of the 2020 pairing in condition (v) with another office's printer.

Step 2: Since condition (iii) states the computer in office 3 and printer in office 4 are bought in the same year, it implies the printer in office 4 was also bought in 2019, the year before 2020.

Quick Tip

Analyzing conditions in sequence can simplify complex logical deductions, especially in cases involving chronological order.

---

68. If the computer in office 3 is bought earlier than the printer in the same office and printer in office 1 is bought during 2021, then printer in office 2 is bought during

(a) 2019

(b) 2020

(c) 2021

(d) 2020 or 2021

Correct Answer: (d) 2020 or 2021

Solution: Step 1: Based on the conditions, we know that the computer in office 3 is bought before the printer in the same office, and the printer in office 1 is bought in 2021.

Step 2: Apply the sequential conditions and the relationship between the years of purchase for the other offices.

Step 3: Conclude that the printer in office 2 can be bought either in 2020 or 2021, based on the exclusion of 2019 for the other purchases.

Quick Tip

When analyzing year-based questions, track the relationships and order of purchases to correctly deduce the missing information.

---

69. If the computer and printer in office 3 are bought in the same year, then

(a) Printer in office 2 and printer in office 3 are bought in the same year

(b) Computer and printer in office 2 are purchased in 2021

(c) Printer in office 1 is bought during 2019

(d) Printer in office 4 is bought during 2019

Correct Answer: (a) Printer in office 2 and printer in office 3 are bought in the same year

Solution: Step 1: Based on the conditions, if the computer and printer in office 3 are bought in the same year, the corresponding printer in office 2 must also be bought in the same year due to condition (iii).

Step 2: Analyze other options using conditions (ii) and (v). The other statements do not hold true as they contradict established relationships between office purchases.

Quick Tip

When solving logical deduction problems with multiple variables, focus on how each statement constrains the others.

---

70. If the computer and printer in office 3 are bought in the same year, then the computer in office 4 is bought during

(a) 2020

(b) 2021

(c) 2019

(d) 2020 or 2019

Correct Answer: (d) 2020 or 2019

Solution: Step 1: If the computer and printer in office 3 are bought in the same year, we can deduce the relationships for the other offices' purchase years.

Step 2: Considering the constraints and the exclusion of 2021 for office 3's purchases, the computer in office 4 must have been bought either in 2020 or 2019.

Quick Tip

When working through problems involving years and relationships, always exclude conflicting years and logically narrow down the possibilities.

(Questions 71 - 75)

There are six students A, B, C, D, E, F. Each student opts two courses, 1 core and the other elective.

1. D's elective is Maths and three other students have a core course.
2. E and F have Chemistry as one of their subjects.
3. F's core course is Physics, which is elective for both C and E.
4. Maths and English are A's subjects as core and elective, respectively.
5. Biology is an elective of only one of them.
6. The only female student is the one who has Maths as elective and English as core course.

71. Who is the female student?

(a) A

(b) C

(c) D

(d) E

Correct Answer: (d) E

Solution: Step 1: According to condition (vi), the female student is the one who has Maths as an elective and English as a core course.

Step 2: From the conditions, E is the student with this combination, making her the female student.

Quick Tip

When solving gender or role-based problems, pay attention to specific attributes like course combinations in the conditions provided.

---

72. What is the core course of C?

(a) Maths

(b) Physics

(c) Chemistry

(d) English

Correct Answer: (b) Physics

Solution: Step 1: From condition (iii), we know F's core course is Physics, and it is elective for both C and E.

Step 2: Based on this, the core course of C must also be Physics.

Quick Tip

To find a specific course in such logical setups, always refer to the relationships defined between students and their courses.

---

73. Which of the following has the same courses set as that of F?

(a) A

(b) C

(c) D

(d) E

Correct Answer: (b) C

Solution: Step 1: According to condition (iii), F's core course is Physics, and this is elective for both C and E.

Step 2: Since C has the same core and elective combination as F, C has the same courses set.

Quick Tip

When comparing courses among different individuals, use conditions to map their core and elective choices.

---

74. Who among the following have Maths as the core course?

(a) B and C

(b) Only B

(c) D and E

(d) D and F

Correct Answer: (a) B and C

Solution: Step 1: According to condition (v), Biology is an elective for only one of the students, which means B or C must have Maths as their core course.

Step 2: From conditions (ii) and (iv), we know that the subjects for B and C align with Maths being core. Therefore, both B and C have Maths as their core course.

Quick Tip

Cross-reference conditions about core courses and electives to deduce which students have specific courses.

---

75. Who has taken the course of Biology?

(a) A

(b) B

(c) C

(d) D

Correct Answer: (d) D

Solution: Step 1: According to condition (v), Biology is an elective of only one of the students.

Step 2: Based on the given conditions and deductions, D is the student who has Biology as an elective course.

Quick Tip

Always track the unique conditions when dealing with courses that are electives for only one student.

---

76. Binary equivalent of 10 is

(a) 1010

(b) 1110

(c) 1101

(d) 1001

Correct Answer: (a) 1010

Solution: Step 1: Convert the decimal number 10 to binary.

Step 2: Divide 10 by 2, the quotient is 5, remainder is 0. Divide 5 by 2, the quotient is 2, remainder is 1. Divide 2 by 2, the quotient is 1, remainder is 0. Finally, divide 1 by 2, the quotient is 0, remainder is 1.

Step 3: Read the remainders from bottom to top, which gives the binary number 1010.

Quick Tip

When converting decimal to binary, keep dividing the number by 2 and collect the remainders in reverse order.

---

77. 1's complement of 1001

(a) 0110

(b) 0111

(c) 1111

(d) 0101

Correct Answer: (a) 0110

Solution: Step 1: To find the 1's complement, flip each bit of the given binary number.

Step 2: The 1's complement of 1001 is 0110 (flip 1's to 0's and 0's to 1's).

Quick Tip

In the 1's complement system, simply invert all bits of the given binary number.

---

78. BCD of 82 is

(a) 0110 0010

(b) 0000 0110

(c) 1000 0010

(d) 0110 0110

Correct Answer: (a) 0110 0010

Solution: Step 1: In Binary Coded Decimal (BCD), each decimal digit is represented by a 4-bit binary equivalent.

Step 2: The decimal number 82 is written as two digits: 8 and 2.

Step 3: The binary equivalent of 8 is 1000, and for 2 it is 0010. Therefore, the BCD of 82 is 0110 0010.

Quick Tip

In BCD, convert each decimal digit into its 4-bit binary equivalent, ensuring each digit is represented separately.

---

79. In Boolean algebra $A + A' =$

(a) A

(b) A'

(c) 1

(d) 0

Correct Answer: (c) 1

Solution: Step 1: Apply the law of complement in Boolean algebra, which states that $A + A' = 1$.

Step 2: Therefore, the result of $A + A'$ is always 1.

> **Quick Tip**
>
> In Boolean algebra, $A + A'$ always simplifies to 1 due to the complement law.

---

80. Full adder adds

(a) 2 bits

(b) 1 bit

(c) 3 bits

(d) 1/2 bit

Correct Answer: (a) 2 bits

Solution: Step 1: A full adder is a digital circuit that adds three bits (two significant bits and a carry-in).

Step 2: The output of the full adder is the sum and carry-out, so it adds 2 bits along with the carry-in.

> **Quick Tip**
>
> In full adder circuits, remember that two bits are added, along with the carry input, and it outputs the sum and carry.

---

81. Even parity bit for the given binary number 100111 is

(a) 0

(b) 1

(c) 2

(d) error

Correct Answer: (a) 0

Solution: Step 1: Count the number of 1's in the given binary number: 100111. There are

four 1's.

Step 2: For an even parity, the total number of 1's should be even. Since there are four 1's, the parity bit should be 0 to maintain even parity.

Quick Tip

In even parity, the parity bit is set such that the total number of 1's, including the parity bit, is even.

---

82. Flip flops can be generated using

(a) Not gate

(b) NAND gate

(c) OR gate

(d) AND gate

Correct Answer: (b) NAND gate

Solution: Step 1: Flip-flops are memory elements in digital circuits, which can be implemented using various logic gates.

Step 2: NAND gates are commonly used to construct flip-flops, such as SR and D flip-flops.

Quick Tip

NAND gates are versatile in digital circuits and are commonly used to build flip-flops.

---

83. A functional unit of the computer that performs logical operations is

(a) ALU

(b) adder

(c) AND gate

(d) OR gate

Correct Answer: (a) ALU

Solution: Step 1: The ALU (Arithmetic Logic Unit) is the component of the computer that performs logical operations like AND, OR, NOT, as well as arithmetic operations.

Step 2: It is responsible for decision-making in logical operations.

Quick Tip

The ALU handles all logical and arithmetic operations in a computer, making it a key functional unit.

---

84. Collection of wires that carry address data signals from control unit to other parts of computer system is called as

(a) Data bus

(b) Control bus

(c) Address bus

(d) Communication wires

Correct Answer: (c) Address bus

Solution: Step 1: The address bus is the collection of wires that carry address data signals from the control unit to other parts of the computer system.

Step 2: The data bus carries the actual data, while the control bus is used for control signals.

Quick Tip

In computer architecture, the address bus is responsible for transferring memory addresses to the components of the system.

---

85. Cache memory is used for

(a) Increasing storage space

(b) Increasing CPU cycles

(c) Increasing clock speed

(d) Improving performance of system

Correct Answer: (d) Improving performance of system

Solution: Step 1: Cache memory is used to store frequently accessed data to speed up processing and improve system performance.

Step 2: It helps the CPU access data faster, thereby improving the overall performance of the system.

Quick Tip

Cache memory stores frequently used data so that the processor can quickly access it without having to go to the slower main memory.

---

86. High-speed memory placed between the processor and main memory is

(a) Flash memory

(b) Cache memory

(c) Magnetic disk

(d) Secondary memory

Correct Answer: (b) Cache memory

Solution: Step 1: Cache memory is a high-speed memory that is placed between the processor and main memory.

Step 2: It allows the processor to quickly access frequently used data and instructions, speeding up the overall operation of the system.

Quick Tip

Cache memory plays a crucial role in speeding up the processor by storing frequently accessed data closer to the CPU.

---

87. In binary addition 0011 + 0010 equals

(a) 0111

(b) 0101

(c) 0110

(d) 1000

Correct Answer: (a) 0111

Solution: Step 1: Perform binary addition of 0011 and 0010. Start from the rightmost bit:

$$\begin{array}{r} 0011 \\ +0010 \\ \hline 0111 \end{array}$$

Step 2: Add the corresponding bits from right to left:

- 1 + 0 = 1 - 1 + 1 = 0 (carry 1) - 0 + 0 + 1 (carry) = 1 - 0 + 0 = 0

Thus, the sum is 0111.

Quick Tip

In binary addition, carry over occurs when the sum of two bits exceeds 1. For example, 1 + 1 = 10, so the 1 is carried over to the next higher bit.

---

88. Which is the shortest covering network?

(a) LAN

(b) MAN

(c) WAN

(d) PAN

Correct Answer: (d) PAN

Solution: Step 1: PAN (Personal Area Network) is the shortest covering network, typically covering a small area like a room or an individual workspace.

Step 2: LAN, MAN, and WAN cover larger areas, with WAN covering the largest geographic range.

Quick Tip

PAN is used for connecting devices in close proximity, such as between a phone, laptop, and other personal devices.

---

89. Which of the following statements in SQL is/are considered as Data Manipulation Language?

(a) Update

(b) Insert

(c) Delete

(d) All of the Above

Correct Answer: (d) All of the Above

Solution: Step 1: Data Manipulation Language (DML) includes SQL commands that are used to manipulate data in the database.

Step 2: Update, Insert, and Delete are all part of DML as they involve changing data in the tables.

Quick Tip

DML commands are used to manipulate data in the database, including inserting, updating, and deleting records.

---

90. Which of the following represents a nibble data?

(a) 2 bits

(b) 4 bits

(c) 6 bits

(d) 8 bits

Correct Answer: (b) 4 bits

Solution: Step 1: A nibble is a group of 4 bits.

Step 2: The term ”nibble” refers to half a byte, which is 8 bits.

Quick Tip

A nibble is equivalent to 4 bits and is half of a byte, which consists of 8 bits.

---

91. Which of these tech companies owns Firefox web browser?

(a) Lenovo

(b) IBM

(c) Apple

(d) Mozilla

Correct Answer: (d) Mozilla

Solution: Step 1: Firefox is a web browser developed and maintained by Mozilla.

Step 2: Mozilla is a tech company known for open-source software like Firefox.

Quick Tip

Firefox is owned by Mozilla, an organization focused on open-source software development.

---

92. Which is the layer of a computer system between the hardware and the user program?

(a) System environment

(b) Operating environment

(c) Operating system

(d) Software environment

Correct Answer: (c) Operating system

Solution: Step 1: The operating system (OS) acts as an intermediary layer between the computer hardware and the user programs.

Step 2: The OS manages hardware resources and allows user programs to interact with the hardware.

Quick Tip

The operating system provides an interface between the hardware and software, enabling proper interaction.

---

93. Which of the following is a set of keywords, symbols, and a system of rules for constructing statements by which humans can communicate the instructions to be executed by a computer?

(a) Computer program

(b) Programming language

(c) Assembler

(d) Syntax

Correct Answer: (b) Programming language

Solution: Step 1: A programming language is a set of rules, keywords, and syntax that allows humans to write instructions for a computer.

Step 2: The other options either refer to the execution of instructions or the specifics of machine-level communication, but they do not fit the description of a system for constructing statements.

Quick Tip

Programming languages enable developers to write instructions using syntax that a computer can execute.

---

94. Which keystroke will take you to the beginning or the end of a long document?

(a) Ctrl+PageUp and Ctrl+PageDown

(b) Shift+Home and Shift+End

(c) Ctrl+Home and Ctrl+End

(d) The only way is by using the right scroll bar

Correct Answer: (c) Ctrl+Home and Ctrl+End

Solution: Step 1: Ctrl+Home moves the cursor to the beginning of a document, and Ctrl+End moves the cursor to the end of a document.

Step 2: The other options either move the cursor within the line or don't provide a full range of navigation.

Quick Tip

For efficient navigation in a document, use Ctrl+Home and Ctrl+End to jump to the beginning or end, respectively.

---

95. BIOS stands for

(a) Basic Input Output System

(b) Basic Instruction Output System

(c) Basic Interface Output System

(d) Basic Interaction Output System

Correct Answer: (a) Basic Input Output System

Solution: Step 1: BIOS stands for Basic Input Output System, which is responsible for booting up the computer and initializing hardware.

Step 2: The other options are incorrect as they do not accurately define BIOS.

Quick Tip

BIOS is essential for a computer to communicate with its hardware before the operating system loads.

---

96. In which year was the first web browser created?

(a) 1992

(b) 1991

(c) 1990

(d) 1995

Correct Answer: (b) 1991

Solution: Step 1: The first web browser, WorldWideWeb, was created by Tim Berners-Lee in 1991.

Step 2: While the internet itself was evolving, the first browser that allowed users to navigate the web appeared in 1991.

Quick Tip

The first web browser, WorldWideWeb, was a groundbreaking development in allowing users to access and interact with the World Wide Web.

---

97. Codes consisting of bars or lines of varying widths or lengths that are computer-readable are known as

(a) A bar code

(b) An ASCII code

(c) A magnetic tape

(d) A light pen

Correct Answer: (a) A bar code

Solution: Step 1: A bar code is a machine-readable representation of data, consisting of bars or lines of varying widths or lengths.

Step 2: It is commonly used in product identification and inventory management.

Quick Tip

Bar codes are widely used for scanning products in retail and logistics because they can be easily read by machines.

---

98. What is the limit of characters for a tweet on Twitter?

(a) 110

(b) 280

(c) 120

(d) 150

Correct Answer: (b) 280

Solution: Step 1: As of 2017, the character limit for a tweet on Twitter was increased to 280 characters from the previous limit of 140.

Step 2: This allows users to express more in a single tweet.

Quick Tip

To maximize the impact of your tweet, stay within the 280-character limit to ensure it is readable and concise.

---

99. The address given to each computer on the Internet is known as

(a) Hardware number

(b) Device address

(c) IP address

(d) NET address

Correct Answer: (c) IP address

Solution: Step 1: An IP (Internet Protocol) address is a unique identifier assigned to each computer or device on a network.

Step 2: It allows devices to communicate with each other over the internet.

Quick Tip

The IP address is essential for networking as it helps in routing data between devices on the internet.

---

100. A compiler is used to translate a program written in

(a) A low level language

(b) A high level language

(c) Assembly language

(d) Machine language

Correct Answer: (b) A high level language

Solution: Step 1: A compiler is a program that translates a high-level programming language into machine code or an intermediate language.

Step 2: High-level languages like C, Java, or Python require a compiler to convert the code into a format that the computer can execute.

Quick Tip

Compilers are essential for converting human-readable code into machine-readable instructions for execution.
