SNAP 2016 Question Paper with Solutions

Time Allowed :2 Hours	**Maximum Marks :**180	**Total Questions :**150

General Instructions

Read the following instructions very carefully and strictly follow them:

1. SNAP Test will be conducted in objective mode in 30 cities across the country and the time allotted for it will be 120 minutes.
2. The exam is divided in four sections
3. A total of 150 questions spread across three sections of 40 questions each, and one section of 30 questions.
4. There is a **negative marking** of $\frac{1}{4}$ **mark** for each incorrect answer.
5. The test follows an MCQ format wherein each question lists 4 options out of which a student has to select the right answer.

Quantitative Aptitude & Data Interpretation

Q1. The ratio of monthly incomes of A and B is 7 : 6 and the ratio of their monthly expenditures is 5 : 4. If each of them saves Rupees 600 per month, find the sum of their monthly incomes?

(a) 3600
(b) 2100
(c) 3900
(d) None of these

Correct Answer: (c) 3900

Solution:
Step 1: Assume the incomes. Let the monthly incomes of A and B be $7x$ and $6x$ respectively.
Step 2: Assume the expenditures. Let the monthly expenditures of A and B be $5y$ and $4y$ respectively.
Step 3: Use the saving condition. Savings = Income – Expenditure. - For A: $7x-5y = 600$ - For B: $6x - 4y = 600$
Step 4: Form simultaneous equations.

$$7x - 5y = 600 \quad ...(1)$$

$$6x - 4y = 600 \quad ...(2)$$

Step 5: Simplify equations. From (2): $6x - 4y = 600 \Rightarrow 3x - 2y = 300$ ...(3)
Multiply (3) by 2:

$$6x - 4y = 600$$

(Already the same form).
Now solve (1):

$$7x - 5y = 600$$

Multiply (3) by 5:

$$15x - 10y = 1500$$

Multiply (1) by 2:

$$14x - 10y = 1200$$

Subtract:

$$(15x - 10y) - (14x - 10y) = 1500 - 1200$$

$$x = 300$$

Step 6: Find incomes. - Income of A $= 7x = 7 \times 300 = 2100$ - Income of B $= 6x = 6 \times 300 = 1800$
Step 7: Find sum.

$$\text{Total income} = 2100 + 1800 = 3900$$

Step 8: Final Answer.

$$\text{Sum of incomes} = 2100 + 1800 = \boxed{3900}$$

Quick Tip

When ratios of income and expenditure are given along with equal savings, always assume variables for incomes and expenditures, form two equations, and solve simultaneously.

Q2. A and B have together three times what B and C have, while A, B and C together have 150 rupees more than that of A. If B has five times that of C, then A has

(a) Rupees 300
(b) Rupees 325
(c) Rupees 375
(d) Rupees 225

Correct Answer: (b) Rupees 325

Solution: Let the amounts with A, B, C be A, B, C respectively.

Step 1: Translate the statements to equations.
(i) "A and B together have three times what B and C have" $\Rightarrow A + B = 3(B + C) \Rightarrow A = 2B + 3C$.
(ii) "A, B and C together have Rupees 150 more than A" $\Rightarrow A+B+C = A+150 \Rightarrow B+C = 150$.
(iii) "B has five times that of C" $\Rightarrow B = 5C$.

Step 2: Solve for B and C.
From (ii) and (iii): $B + C = 150 \Rightarrow 5C + C = 150 \Rightarrow 6C = 150 \Rightarrow C = 25$.

Hence $B = 5C = 125$.

Step 3: Find A.
Using (i): $A = 2B + 3C = 2(125) + 3(25) = 250 + 75 = 325$.

$$\boxed{A = \textit{Rupees } 325}$$

Quick Tip

When multiple "together/than" comparisons are given, convert each sentence into a linear equation. Use easy substitutions (like $B = 5C$) to reduce variables quickly.

Q3. A cricket player after playing 15 tests scored 124 runs in the 16th test. As a result, the average of his runs is increased by 4. The present average of runs is

(a) 55
(b) 64
(c) 60
(d) 68

Correct Answer: (b) 64

Solution:

Step 1: Assume the initial average.
Let the average runs for the first 15 tests be x.
So, the total runs in 15 tests $= 15x$.

Step 2: Add the 16th test runs.
In the 16th test, he scores 124 runs.
So, the total runs after 16 tests $= 15x + 124$.

Step 3: Write the condition for increased average.
The new average $= x + 4$.
Also, new average $= \dfrac{15x + 124}{16}$.

$$\frac{15x + 124}{16} = x + 4$$

Step 4: Solve the equation.
$15x + 124 = 16x + 64$
$\Rightarrow 124 - 64 = 16x - 15x$
$\Rightarrow x = 60$.

Step 5: Find the new average.
New average $= x + 4 = 60 + 4 = 64$.

$$\boxed{64}$$

Quick Tip

When an average increases after adding a new term, equate the new average formula with the given condition. Always express in terms of n and $n+1$ items for clarity.

Q4. A fruit seller buys some apples at the rate of 5 for Rupees 6 and an equal number more at 4 for Rupees 5. He sells the whole lot at 9 for Rupees 11. What is his loss or gain percent?

(a) loss $\frac{100}{441}$ %
(b) gain $\frac{100}{441}$ %
(c) No profit No loss
(d) Loss $\frac{5}{22}$ %

Correct Answer: (a) loss $\frac{100}{441}$ %

Solution:

Step 1: Assume number of apples.
Let the fruit seller buy 20 apples in the first case and 20 in the second case (equal numbers for convenience).

Step 2: Find cost price (C.P.) of first lot.
Rate = 5 apples for Rupees 6.
So, cost of 20 apples $= \frac{20}{5} \times 6 = 4 \times 6 = \textit{Rupees } 24$.

Step 3: Find cost price of second lot.
Rate = 4 apples for Rupees 5.
So, cost of 20 apples $= \frac{20}{4} \times 5 = 5 \times 5 = \textit{Rupees } 25$.

Step 4: Total cost price.
Total apples = 20 + 20 = 40.
Total C.P. = 24 + 25 = Rupees 49.

Step 5: Selling price (S.P.) of all apples.
Rate = 9 apples for Rupees 11.

So, S.P. of 40 apples $= \frac{40}{9} \times 11 = \frac{440}{9} \approx Rupees 48.89$.

Step 6: Calculate loss.
Loss = C.P. - S.P. $= 49 - \frac{440}{9} = \frac{441 - 440}{9} = \frac{1}{9}$.

Step 7: Loss percentage.

$$\text{Loss } \% = \frac{\text{Loss}}{\text{C.P.}} \times 100 = \frac{\frac{1}{9}}{49} \times 100 = \frac{100}{441}\%.$$

$$\boxed{\text{Loss } \frac{100}{441}\%}$$

Quick Tip

When equal numbers of items are bought at different rates, take the LCM of quantities to simplify calculations. Always compute total C.P. and S.P. carefully before calculating percentage profit or loss.

Q5. A can do a piece of work in 6 days while B alone can do it in 8 days. With the help of C, they can complete the work in 2 days. If they are paid Rupees 720 for the whole work, how much money A gets?
(a) Rupees 180
(b) Rupees 240
(c) Rupees 300
(d) Rupees 420

Correct Answer: (b) Rupees 240

Solution:
Step 1: Work rates of A and B
A completes the work in 6 days. Hence, A's 1-day work $= \frac{1}{6}$.
B completes the work in 8 days. Hence, B's 1-day work $= \frac{1}{8}$.

Step 2: Combined rate of A, B, and C
Together, A, B, and C complete the work in 2 days. Hence, their combined 1-day work $= \frac{1}{2}$.

Step 3: Finding C's rate

$$\frac{1}{6} + \frac{1}{8} + \text{C's 1-day work} = \frac{1}{2}$$

Take LCM of 6 and 8, which is 24:

$$\frac{4}{24} + \frac{3}{24} + \text{C's 1-day work} = \frac{1}{2}$$

$$\frac{7}{24} + \text{C's 1-day work} = \frac{1}{2}$$

$$\text{C's 1-day work} = \frac{1}{2} - \frac{7}{24} = \frac{12}{24} - \frac{7}{24} = \frac{5}{24}$$

Step 4: Work done individually in 2 days
- Work done by A in 2 days $= 2 \times \frac{1}{6} = \frac{2}{6} = \frac{1}{3}$.
- Work done by B in 2 days $= 2 \times \frac{1}{8} = \frac{2}{8} = \frac{1}{4}$.
- Work done by C in 2 days $= 2 \times \frac{5}{24} = \frac{10}{24} = \frac{5}{12}$.

Check: $\frac{1}{3} + \frac{1}{4} + \frac{5}{12} = \frac{4}{12} + \frac{3}{12} + \frac{5}{12} = 1$.

Step 5: Payment distribution
The total payment is distributed in the ratio of work done.
Work fractions = A : B : C $= \frac{1}{3} : \frac{1}{4} : \frac{5}{12}$.
Take LCM of 12: $\frac{4}{12} : \frac{3}{12} : \frac{5}{12} = 4 : 3 : 5$.

Step 6: A's share
Total ratio sum $= 4 + 3 + 5 = 12$.
A's share $= \frac{4}{12} \times 720 = \frac{1}{3} \times 720 = 240$.

$$\boxed{240}$$

Quick Tip

In work and wages problems, always reduce the data to "1-day work" (or unit work). Then compare each person's contribution over the total period and divide wages in the same ratio.

Q6. P and Q are working on an assignment. P takes 3 hours to type 20 pages on a computer. While Q takes 4 hours to type 25 pages. How much time will they together take to type an assignment of 620 pages working on two different computers?

(a) 64 hrs
(b) 48 hrs
(c) 40 hrs
(d) 60 hrs

Correct Answer: (b) 48 hrs

Solution:
Step 1: Rate of work of P
P types 20 pages in 3 hours.
So, P's typing rate = $\frac{20}{3}$ pages per hour.

Step 2: Rate of work of Q
Q types 25 pages in 4 hours.
So, Q's typing rate = $\frac{25}{4}$ pages per hour.

Step 3: Combined rate of P and Q

$$\text{P's rate} + \text{Q's rate} = \frac{20}{3} + \frac{25}{4}$$

Take LCM of 3 and 4 = 12:

$$\frac{80}{12} + \frac{75}{12} = \frac{155}{12}$$

So, together they type $\frac{155}{12}$ pages per hour.

Step 4: Time required for 620 pages

$$\text{Time} = \frac{\text{Total pages}}{\text{Combined rate}} = \frac{620}{\frac{155}{12}} = 620 \times \frac{12}{155}$$

Simplify: $620 \div 155 = 4$.

$$= 4 \times 12 = 48\,\text{hours}$$

$$\boxed{48\,\text{hours}}$$

Quick Tip

In work problems with typing or production, always convert data into *rate per hour* (or per unit time). Then add rates for combined work and divide total task by combined rate.

Q7. A shopkeeper bought 30 kg of rice at the rate of Rupees 90 per kg. He sold forty percent of the total quantity at the rate of Rupees 60 per kg. Approximately at what price per kg should he sell the remaining quantity to make 25% overall profit?
(a) 155.5
(b) 167.5
(c) 157.5
(d) 147.5

Correct Answer: (d) 147.5

Solution:
Step 1: Compute total cost and target revenue
Cost price (CP) per kg = *Rupees* 90. Total quantity = 30 kg.
Total CP = $30 \times 90 =$ *Rupees* 2700.
Target profit = 25% $\Rightarrow$ Required total selling price (SP)

$$\Rightarrow \text{ Target SP} = 2700 \times 1.25 = \textit{Rupees } 3375.$$

Step 2: Revenue from the first part sold
40% of 30 kg = 12 kg sold at Rupees 60/kg.
Revenue from this part = $12 \times 60 =$ *Rupees* 720.

Step 3: Find needed price for the remaining quantity
Remaining quantity = $30 - 12 = 18$ kg.
Revenue still needed = $3375 - 720 =$ *Rupees* 2655.
Required price per kg for the remaining $= \dfrac{2655}{18} =$ *Rupees* 147.5.

$$\boxed{\text{Sell the remaining at } \textit{Rupees } 147.5 \text{ per kg}}$$

Quick Tip

For mixed selling-price problems, first compute the *target total revenue* using the desired overall profit on total cost. Subtract any revenue already realized, then divide by the remaining quantity to get the required price.

Q8. If $X = 2 + \sqrt{3}$, then the value of $\sqrt{X} + \dfrac{1}{\sqrt{X}}$ is:
(a) $\sqrt{3}$
(b) $\sqrt{6}$
(c) $2\sqrt{6}$
(d) 6

Correct Answer: (b) $\sqrt{6}$

Solution:
Step 1: Expression to evaluate
We need:

$$\sqrt{X} + \frac{1}{\sqrt{X}}.$$

Step 2: Rationalize and simplify
Let

$$y = \sqrt{X} + \frac{1}{\sqrt{X}}.$$

Then

$$y^2 = X + \frac{1}{X} + 2.$$

Step 3: Simplify $X + \frac{1}{X}$
Given $X = 2 + \sqrt{3}$.

$$\frac{1}{X} = \frac{1}{2+\sqrt{3}} \times \frac{2-\sqrt{3}}{2-\sqrt{3}} = 2 - \sqrt{3}.$$

So

$$X + \frac{1}{X} = (2 + \sqrt{3}) + (2 - \sqrt{3}) = 4.$$

Step 4: Substitute into y^2

$$y^2 = X + \frac{1}{X} + 2 = 4 + 2 = 6.$$

$$y = \sqrt{6}.$$

$$\boxed{\sqrt{6}}$$

Quick Tip

When dealing with expressions like $\sqrt{X} + \frac{1}{\sqrt{X}}$, squaring helps eliminate radicals and makes use of the identity $y^2 = X + \frac{1}{X} + 2$.

Q9. In an equilateral triangle ABC, if the area of its in-circle is 4π cm^2, then find the length of the angle bisector AD?
(a) 2 cm
(b) 4 cm
(c) 6 cm
(d) 10 cm

Correct Answer: (c) 6 cm

Solution:
Step 1: Find the inradius.
Area of in-circle $= \pi r^2 = 4\pi \Rightarrow r = 2$ cm.

Step 2: Relate r and side a of an equilateral triangle.
For an equilateral triangle, $r = \dfrac{\sqrt{3}}{6}\, a \Rightarrow a = \dfrac{6r}{\sqrt{3}} = \dfrac{12}{\sqrt{3}} = 4\sqrt{3}$ cm.

Step 3: Angle bisector equals altitude.
In an equilateral triangle, the angle bisector AD is also the altitude: $AD = \dfrac{\sqrt{3}}{2}\, a = \dfrac{\sqrt{3}}{2} \cdot 4\sqrt{3} = \dfrac{4 \cdot 3}{2} = 6$ cm.

$$\boxed{6 \text{ cm}}$$

Quick Tip

In an equilateral triangle, median = altitude = angle bisector = perpendicular bisector. Use $r = \frac{\sqrt{3}}{6}a$ and $h = \frac{\sqrt{3}}{2}a$ to move between inradius, side, and altitude quickly.

Q10. If $x + \dfrac{1}{x-1} = 5$, then find the value of $(x-1)^2 + \dfrac{1}{(x-1)^2}$?
(a) 10
(b) 11
(c) 14
(d) None of these

Correct Answer: (c) 14

Solution:
Step 1: Substitute $y = x - 1$.
Then $x = y + 1$, so

$$x + \frac{1}{x-1} = (y+1) + \frac{1}{y} = 5 \;\Rightarrow\; y + \frac{1}{y} = 4.$$

Step 2: Use the identity for squares.

$$\left(y + \frac{1}{y}\right)^2 = y^2 + \frac{1}{y^2} + 2 \Rightarrow y^2 + \frac{1}{y^2} = 4^2 - 2 = 16 - 2 = 14.$$

Step 3: Translate back.
Since $y = x - 1$, we get

$$(x-1)^2 + \frac{1}{(x-1)^2} = 14.$$

Quick Tip

When you see x together with $\frac{1}{x-1}$ and are asked for $(x-1)^2+\frac{1}{(x-1)^2}$, set $y=x-1$ and use $(y+\frac{1}{y})^2=y^2+\frac{1}{y^2}+2$.

Q11. Veeru gave Rupees 2400 on loan. Some amount he gave at 4% per annum simple interest and remaining at 5% per annum simple interest. After two years he got Rupees 220 as interest. Then the amount given at 4% and 5% per annum simple interest are, respectively?
(a) Rupees 1000, Rupees 1400
(b) Rupees 800, Rupees 1600
(c) Rupees 1800, Rupees 600
(d) Rupees 2200, Rupees 200

Correct Answer: (a) Rupees 1000, Rupees 1400

Solution:
Step 1: Let the amounts be variables.
Suppose x at 4% and $(2400-x)$ at 5%.

Step 2: Write simple interest equations.
Simple interest formula: $SI=\frac{P\cdot R\cdot T}{100}$.
For 2 years: Interest on x: $\frac{x\cdot 4\cdot 2}{100}=\frac{8x}{100}=\frac{2x}{25}$.
Interest on $(2400-x)$: $\frac{(2400-x)\cdot 5\cdot 2}{100}=\frac{10(2400-x)}{100}=\frac{2400-x}{10}$.

Step 3: Form the equation.

$$\frac{2x}{25}+\frac{2400-x}{10}=220$$

Multiply through by 50:

$$4x+5(2400-x)=11000$$

$$4x+12000-5x=11000$$

$$-x+12000=11000 \quad \Rightarrow \quad x=1000$$

So, at 4%: Rupees 1000; at 5%: $2400-1000=1400$.

$$\boxed{1000,\ 1400}$$

Quick Tip

For such problems, assign one variable and use SI $= \frac{PRT}{100}$. Remember total principal = sum of parts, and total interest = sum of interests.

Q12. A student was asked to divide a number by 6 and add 12 to the quotient. He however, first added 12 to the number and then divided it by 6, getting 112 as the answer. The correct answer should have been?
(a) 124
(b) 172
(c) 118
(d) 122

Correct Answer: (d) 122

Solution:
Step 1: Express condition mathematically.
Let the number be N.
Correct operation: $\frac{N}{6} + 12$.
Mistaken operation: $\frac{N+12}{6} = 112$.

Step 2: Solve for N.

$$\frac{N+12}{6} = 112 \quad \Rightarrow \quad N + 12 = 672 \quad \Rightarrow \quad N = 660.$$

Step 3: Compute correct answer.

$$\frac{N}{6} + 12 = \frac{660}{6} + 12 = 110 + 12 = 122.$$

$$\boxed{122}$$

Quick Tip

When a problem involves misinterpretation of operations, carefully set up both the intended and the mistaken operations. Always verify with the final options to avoid errors.

Q13. The average of marks obtained by 120 candidates in a certain examination is 35. If the average marks of passed candidates is 39 and that of the failed candidates is 15, what is the number of candidates who passed the examination?
(a) 90
(b) 85
(c) 100

(d) 120

Correct Answer: (c) 100

Solution:
Step 1: Convert averages to total marks.
Overall average = 35 for 120 candidates $\Rightarrow$ total marks = $120 \times 35 = 4200$.

Step 2: Let the number of passed candidates be p.
Then failed candidates = $120 - p$.
Total marks = (passed total) + (failed total)

$$39p + 15(120 - p) = 4200.$$

Step 3: Solve for p.

$$39p + 1800 - 15p = 4200 \Rightarrow 24p = 2400 \Rightarrow p = 100.$$

$$\boxed{100}$$

Quick Tip

When two groups have different averages, use *total* = $(\text{avg}_1 \times \text{size}_1) + (\text{avg}_2 \times \text{size}_2)$, or set up a weighted-average equation and solve for the group size.

Q14. Two pipes A, B can fill a tank in 24 min and 32 min respectively. If both pipes are opened simultaneously, after how much time should B be closed so that the tank is full in 18 min?
(a) 8 min
(b) 12 min
(c) 15 min
(d) 20 min

Correct Answer: (a) 8 min

Solution:
Step 1: Write filling rates.
A's rate = $\frac{1}{24}$ tank/min; B's rate = $\frac{1}{32}$ tank/min.

Step 2: Set up the total-fill equation.
Let B be closed after t minutes.
A works for all 18 minutes; B works for t minutes.

$$18 \cdot \frac{1}{24} + t \cdot \frac{1}{32} = 1.$$

Step 3: Solve for t.

$$\frac{18}{24} + \frac{t}{32} = 1 \Rightarrow \frac{3}{4} + \frac{t}{32} = 1 \Rightarrow \frac{t}{32} = \frac{1}{4} \Rightarrow t = 8 \text{ min.}$$

$$\boxed{8 \text{ minutes}}$$

Quick Tip

In variable-time pipe problems, keep one pipe running the full duration and treat the other for t minutes. Add their *work* (rate $\times$ time) to equal 1 full tank.

Q15. A tap can fill a tank in 6 hours. After half the tank is filled, three more similar taps are opened. What is the total time taken to fill the tank completely?
(a) 3 hours 15 min
(b) 3 hours 45 min
(c) 3 hours 40 min
(d) 3 hours 50 min

Correct Answer: (b) 3 hours 45 min

Solution:
Step 1: Write the single–tap rate.
One tap fills the tank in 6 hours $\Rightarrow$ rate $= \frac{1}{6}$ tank/hour.

Step 2: Time to fill the first half with one tap.

$$t_1 = \frac{\text{work}}{\text{rate}} = \frac{\frac{1}{2}}{\frac{1}{6}} = 3 \text{ hours.}$$

Step 3: Fill the remaining half with 4 taps (1 existing + 3 new).
Combined rate $= 4 \times \frac{1}{6} = \frac{2}{3}$ tank/hour.

$$t_2 = \frac{\frac{1}{2}}{\frac{2}{3}} = \frac{1}{2} \times \frac{3}{2} = \frac{3}{4} \text{ hour} = 45 \text{ minutes.}$$

Step 4: Total time.

$$t_{\text{total}} = t_1 + t_2 = 3 \text{ hours} + 45 \text{ minutes} = 3 \text{ hours } 45 \text{ minutes.}$$

$$\boxed{3 \text{ hours } 45 \text{ minutes}}$$

Quick Tip

Break the work at the switching point. Compute time for each phase using time $= \frac{\text{work}}{\text{rate}}$ and add them.

Q16. A company produces two articles, A and B. The per unit price of A is 25% less than the per unit price of B. By what percent is the sales (units) of A more than the sales of B if the revenue earned from A is 1.5 times the total revenue earned from B?
(a) 50%
(b) 75%
(c) 100%
(d) 125%

Correct Answer: (c) 100%

Solution:
Step 1: Translate prices.
Let P_B be B's price and $P_A = 0.75P_B$ (25% less).

Step 2: Use the revenue relation.
Let Q_A, Q_B be units sold. Given revenue $R_A = 1.5R_B$:

$$P_A Q_A = 1.5\, P_B Q_B \quad \Rightarrow \quad 0.75 P_B\, Q_A = 1.5 P_B\, Q_B.$$

Cancel $P_B > 0$: $0.75Q_A = 1.5Q_B \Rightarrow Q_A/Q_B = 2$.

Step 3: Percent by which A's sales exceed B's.

$$\frac{Q_A - Q_B}{Q_B} \times 100 = \frac{2Q_B - Q_B}{Q_B} \times 100 = 100\%.$$

$$\boxed{100\%}$$

Quick Tip

When comparing sales from revenue, set $R = P \times Q$. If one price is a known percent of the other, cancel the common factor to get the ratio of quantities directly.

Q17. The salary of a man increases by 10% in the first year, then by 20% in the second year and then by 25% in the third year. If the last increase is equivalent to an increase of Rupees 6600, then what is the equivalent of the second increase?
(a) Rupees 2000
(b) Rupees 2200
(c) Rupees 4000
(d) Rupees 4400

Correct Answer: (d) Rupees 4400

Solution:
Step 1: Let the initial yearly salary be S.
After 1st year: $1.10S$.
After 2nd year: $1.10 \times 1.20S = 1.32S$.

Step 2: Use the third (last) increase.
Third increase amount = 25% of the salary after the second year = $0.25 \times (1.32S) = 0.33S$.
Given this equals *Rupees* 6600: $0.33S = 6600 \Rightarrow S = 20000$.

Step 3: Compute the second increase.
Second increase amount = 20% of the salary after the first year = $0.20 \times (1.10S) = 0.22S$.
Hence $0.22 \times 20000 =$ *Rupees* 4400.

$$\boxed{\textit{Rupees } 4400}$$

Quick Tip

Successive percentage changes apply *multiplicatively*. To find an increment in a later year, multiply the base S by the cumulative factor up to that year and the given percentage.

Q18. The profit earned after selling an article for Rupees 996 is the same as the loss incurred after selling the article for Rupees 894. What is the cost price of the article?
(a) Rupees 935
(b) Rupees 905
(c) Rupees 945
(d) Rupees 975

Correct Answer: (c) Rupees 945

Solution:
Step 1: Set up the equation.
Let cost price be C.
Profit at Rupees 996 = $996 - C$.
Loss at Rupees 894 = $C - 894$.
Given equal: $996 - C = C - 894$.

Step 2: Solve for C.

$$996 + 894 = 2C \Rightarrow 1890 = 2C \Rightarrow C = 945.$$

$$\boxed{\textit{Rupees } 945}$$

Quick Tip

When equal profit and loss are mentioned at two selling prices, the cost price is simply the *midpoint* of those prices: $C = \frac{SP_1+SP_2}{2}$.

Q19. Deepti invests 11% of her monthly salary i.e., 5,236 in Fixed Deposits. Later she invests 19% of her salary on Life Insurance policies and 7% on Mutual Funds. What is the total annual amount invested by Deepti?
(a) 2,11,344
(b) 17,612
(c) 1,05,672
(d) 35,224

Correct Answer: (a) 2,11,344

Solution:
Step 1: Find 1% of salary.
$11\% = 5{,}236 \Rightarrow 1\% = \frac{5236}{11} = 476.$

Step 2: Total percent invested per month.
Total $= 11\% + 19\% + 7\% = 37\%$.
Monthly investment $= 37\%$ of salary $= 37 \times 476 = 17{,}612$.

Step 3: Annual investment.
Annual $= 12 \times 17{,}612 = 2{,}11{,}344$.

$$\boxed{2{,}11{,}344}$$

Quick Tip

When a clean percent value is given for a rupee amount, first compute "1%" and scale up—this avoids solving for the full salary explicitly.

Q20. By selling 18 articles, a shopkeeper earns the cost price of 24 articles. By what percent should he increase the selling price so that by selling 24 articles, he earns the cost price of 36 articles?
(a) 10%
(b) 20%
(c) 12.5%
(d) 25%

Correct Answer: (c) 12.5%

Solution:
Step 1: Current selling price to cost price ratio.
From $18\,SP = 24\,CP \Rightarrow \frac{SP}{CP} = \frac{24}{18} = \frac{4}{3}$.

Step 2: Required ratio.
We want $24\,SP_{\text{new}} = 36\,CP \Rightarrow \frac{SP_{\text{new}}}{CP} = \frac{36}{24} = \frac{3}{2}$.

Step 3: Percentage increase in SP.

$$\%\text{ increase} = \frac{SP_{\text{new}} - SP}{SP} \times 100 = \frac{\frac{3}{2} - \frac{4}{3}}{\frac{4}{3}} \times 100 = \frac{\frac{1}{6}}{\frac{4}{3}} \times 100 = \frac{1}{6} \cdot \frac{3}{4} \times 100 = 12.5\%.$$

$$\boxed{12.5\%}$$

Quick Tip

Translate statements like "selling n items earns cost of m items" into ratios: $\frac{SP}{CP} = \frac{m}{n}$. Then compare ratios to get the required percent change.

Q21. If $\sec(7q + 28^\circ) = \csc(30^\circ - 3q)$, then find q.
(a) 8°
(b) 5°
(c) 6°
(d) 9°

Correct Answer: (a) 8°

Solution:
Step 1: Convert to cosine equality.
$\sec A = \csc B \;\Rightarrow\; \frac{1}{\cos A} = \frac{1}{\sin B} \;\Rightarrow\; \cos A = \sin B$.
Here $A = 7q + 28^\circ,\ B = 30^\circ - 3q$.

Step 2: Use $\sin\theta = \cos(90^\circ - \theta)$.
$\cos(7q + 28^\circ) = \sin(30^\circ - 3q) = \cos\big(90^\circ - (30^\circ - 3q)\big) = \cos(60^\circ + 3q)$.

Step 3: Solve $\cos\alpha = \cos\beta$.
Either $7q + 28^\circ = 60^\circ + 3q + 360^\circ k$ or $7q + 28^\circ = -(60^\circ + 3q) + 360^\circ k$.
From the first: $4q = 32^\circ + 360^\circ k \Rightarrow q = 8^\circ + 90^\circ k$.
Taking $k = 0$ gives $q = 8^\circ$ (fits options). The second branch gives no listed small positive option.

$$\boxed{8^\circ}$$

Quick Tip

Turn sec/csc equations into cos/sin and then use $\sin\theta = \cos(90^\circ - \theta)$ so you can apply $\cos\alpha = \cos\beta \Rightarrow \alpha = \pm\beta + 360^\circ k$.

Q22. Find the value of $\cos 24^\circ + \cos 55^\circ + \cos 125^\circ + \cos 156^\circ$**.**
(a) 0
(b) 2
(c) 3
(d) 1

Correct Answer: (a) 0

Solution:
Step 1: Use $\cos(180^\circ - \theta) = -\cos\theta$**.**
$\cos 156^\circ = \cos(180^\circ - 24^\circ) = -\cos 24^\circ, \quad \cos 125^\circ = \cos(180^\circ - 55^\circ) = -\cos 55^\circ.$

Step 2: Pair and sum.

$$(\cos 24^\circ + \cos 156^\circ) + (\cos 55^\circ + \cos 125^\circ) = (\cos 24^\circ - \cos 24^\circ) + (\cos 55^\circ - \cos 55^\circ) = 0.$$

$$\boxed{0}$$

Quick Tip

Whenever you see angles that are supplements (θ and $180^\circ - \theta$), pair them using $\cos(180^\circ - \theta) = -\cos\theta$ to simplify quickly.

Q23. If $ax + by = 6$**,** $bx - ay = 2$ **and** $x^2 + y^2 = 4$**, then the value of** $(a^2 + b^2)$ **would be:**
(a) 10
(b) 2
(c) 4
(d) 5

Correct Answer: (a) 10

Solution:
Step 1: Square and add the given linear equations.

$$(ax + by)^2 + (bx - ay)^2 = \left(a^2x^2 + 2abxy + b^2y^2\right) + \left(b^2x^2 - 2abxy + a^2y^2\right) = (a^2 + b^2)(x^2 + y^2).$$

Step 2: Substitute numerical values.
Left side: $6^2 + 2^2 = 36 + 4 = 40$.
Right side: $(a^2 + b^2) \cdot (x^2 + y^2) = (a^2 + b^2) \cdot 4$.

$$40 = 4(a^2 + b^2) \Rightarrow a^2 + b^2 = 10.$$

$$\boxed{10}$$

Quick Tip

For pairs like $ax + by$ and $bx - ay$, squaring and adding cancels the xy terms, yielding $(a^2 + b^2)(x^2 + y^2)$ cleanly.

Q24. A cylindrical pipe of radius $1.4\,\mathrm{m}$ has water flowing out at $2.5\,\mathrm{m/s}$ into a cuboidal tank of dimensions $28\,\mathrm{m} \times 11\,\mathrm{m} \times 25\,\mathrm{m}$. The flow completely occupies the pipe's cross-section. What percentage of the tank is filled up in 8 min 20 s?
(a) 66.66%
(b) 100%
(c) 86%
(d) 75%

Correct Answer: (b) 100%

Solution:
Step 1: Compute flow rate from the pipe.
Cross-sectional area $A = \pi r^2 = \pi(1.4)^2 = \pi \cdot 1.96$.
Speed $v = 2.5\,\mathrm{m/s}$.
Volumetric flow rate $Q = Av = 1.96\pi \times 2.5 = 4.9\pi\ \mathrm{m}^3/\mathrm{s}$.

Step 2: Volume delivered in the given time.
Time $t = 8$ min 20 s $= 500$ s.
Volume $V_{\text{in}} = Qt = 4.9\pi \times 500 = 2450\pi\ \mathrm{m}^3$.

Step 3: Tank volume and fill percentage.
Tank volume $V_T = 28 \times 11 \times 25 = 7700\ \mathrm{m}^3$.
Fill fraction $= \dfrac{2450\pi}{7700} = \dfrac{7\pi}{22} \approx 0.9996$.
Percentage $\approx 99.96\%\ \approx 100\%$.

$$\boxed{100\%}$$

Quick Tip

For steady flow, use $Q = Av$ and $V = Qt$. Converting time to seconds keeps units consistent; then compare V to the tank capacity for the percentage.

Q25. The area of a trapezium of height $40\,\text{cm}$ is $1600\,\text{cm}^2$. One parallel side is $10\,\text{cm}$ longer than the other side. Find the ratio of the lengths of the parallel sides.
(a) 7 : 9
(b) 5 : 7
(c) 3 : 5
(d) 2 : 3

Correct Answer: (a) 7 : 9

Solution:
Step 1: Set variables and use area formula.
Let the shorter and longer parallel sides be a and b (in cm) with $b = a + 10$.
Area of a trapezium: Area $= \frac{1}{2}(a + b) \times h$.
Given $h = 40$ and area $= 1600$:

$$\frac{1}{2}(a + b) \cdot 40 = 1600 \;\Rightarrow\; 20(a + b) = 1600 \;\Rightarrow\; a + b = 80.$$

Step 2: Solve for the sides.
With $b = a + 10$:

$$a + (a + 10) = 80 \;\Rightarrow\; 2a = 70 \;\Rightarrow\; a = 35, \quad b = 45.$$

Step 3: Form the ratio.

$$\text{Required ratio } a : b = 35 : 45 = \frac{35}{5} : \frac{45}{5} = 7 : 9.$$

$$\boxed{7 : 9}$$

Quick Tip

For trapezium problems, the sum of parallel sides comes directly from Area $= \frac{1}{2}(a+b)h$. Combine with any linear relation (like a difference) to solve quickly.

Q26. Some spherical balls of diameter $2.8\,\text{cm}$ are dropped into a cylindrical container containing some water and are fully submerged. The diameter of the container is $14\,\text{cm}$. Find how many balls have been dropped in it if the water rises by $11.2\,\text{cm}$.
(a) 50
(b) 150
(c) 250

(d) 350

Correct Answer: (b) 150

Solution:
Step 1: Volumes displaced.
Rise in water gives cylinder volume increase:
Container radius $R = \dfrac{14}{2} = 7\,\text{cm}$, rise $h = 11.2\,\text{cm}$.

$$V_{\text{rise}} = \pi R^2 h = \pi \cdot 7^2 \cdot 11.2 = \pi \cdot 49 \cdot 11.2 = 548.8\,\pi \text{ cm}^3.$$

Step 2: Volume of one sphere.
Ball radius $r = \dfrac{2.8}{2} = 1.4\,\text{cm}$.

$$V_{\text{sphere}} = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi(1.4)^3 = \frac{4}{3}\pi(2.744) = \frac{1372}{375}\pi \text{ cm}^3.$$

Step 3: Number of balls.
Let n be the number of balls. Then

$$n = \frac{V_{\text{rise}}}{V_{\text{sphere}}} = \frac{548.8\,\pi}{\frac{1372}{375}\pi} = \frac{548.8 \times 375}{1372} = \frac{\frac{2744}{5} \times 375}{1372} = \frac{2744}{1372} \times \frac{375}{5} = 2 \times 75 = 150.$$

$$\boxed{150}$$

Quick Tip

Use displacement: rise in cylinder volume $= \pi R^2 h$ equals n times sphere volume $\frac{4}{3}\pi r^3$. The π cancels, keeping arithmetic clean.

Q27. In a competition, a school awarded medals in different categories. 36 medals in dance, 12 medals in dramatics and 18 medals in music. If these medals went to a total of 45 persons and only 4 persons got medals in all the three categories, how many received medals in exactly two of these categories?
(a) 7
(b) 5
(c) 13
(d) 2

Correct Answer: (c) 13

Solution:

Step 1: Notation and given data.
Let D = Dance, R = Dramatics, M = Music.
$|D| = 36,\ |R| = 12,\ |M| = 18,\ |D \cup R \cup M| = 45,\ |D \cap R \cap M| = 4.$

Step 2: Inclusion–exclusion to find the sum of pairwise intersections.

$$|D \cup R \cup M| = |D| + |R| + |M| - \big(|D \cap R| + |D \cap M| + |R \cap M|\big) + |D \cap R \cap M|.$$

Hence

$$45 = 36 + 12 + 18 - S_2 + 4 \ \Rightarrow\ S_2 = 36 + 12 + 18 + 4 - 45 = 25,$$

where $S_2 = |D \cap R| + |D \cap M| + |R \cap M|$.

Step 3: Extract those in exactly two categories.
Every person in all three sets is counted *three* times inside S_2, while a person in exactly two sets is counted once.
Let E_2 be the number who received medals in exactly two categories. With $t = |D \cap R \cap M| = 4$,

$$S_2 = E_2 + 3t \ \Rightarrow\ E_2 = S_2 - 3t = 25 - 12 = 13.$$

$$\boxed{13 \text{ persons}}$$

Quick Tip

For three-set medal problems, first compute $S_2 = \sum$ of pairwise intersections using inclusion–exclusion. Then subtract $3\times$ the "all three" count to get the number in exactly two categories.

Q28. Let $u = (\log_2 x)^2 - 6\log_2 x + 12$ where x is a real number. Then the equation $x^u = 256$ has:
(a) no solution for x
(b) exactly one solution for x
(c) exactly two distinct solutions for x
(d) exactly three distinct solutions for x

Correct Answer: (b) exactly one solution for x

Solution:
Step 1: Domain and substitution.
We need $x > 0$ (so that $\log_2 x$ is defined and x^u makes sense). Let

$$t = \log_2 x \quad \Rightarrow \quad x = 2^t, \qquad u = t^2 - 6t + 12 = (t-3)^2 + 3.$$

Step 2: Convert the equation to base 2.

$$x^u = (2^t)^u = 2^{tu} = 256 = 2^8 \quad \Rightarrow \quad tu = 8.$$

Hence

$$t\,(t^2 - 6t + 12) = 8 \;\Rightarrow\; t^3 - 6t^2 + 12t - 8 = 0.$$

Step 3: Factor the cubic.
Notice

$$(t-2)^3 = t^3 - 6t^2 + 12t - 8,$$

so

$$(t-2)^3 = 0 \;\Rightarrow\; t = 2 \text{ (triple root)}.$$

Step 4: Back-substitute for x.

$$t = \log_2 x = 2 \;\Rightarrow\; x = 2^2 = 4.$$

This yields a single real x. (Note $x = 1$ would give $u = 12$ but $1^{12} \neq 256$.)

Exactly one solution: $x = 4$

Quick Tip

When an exponent depends on log of the base, set $t = \log_b x$ so that $x = b^t$ and rewrite everything in base b. Often the resulting polynomial factorizes neatly.

DIRECTION (Q. 29 30) : Each of the following questions is followed by two statements Mark,
(a) if the question can be answered with the help of statement I alone,
(b) if the question can be answered with the help of statement II alone,
(c) if both, statement I and statement II are needed to answer the question, and
(d) if the statement cannot be answered even with the help of both the statements.

Q29. If R is an integer between 1 and 9, $P - R = 2370$, what is the value of R?
(a) The question can be answered with the help of statement I alone.
(b) The question can be answered with the help of statement II alone.
(c) Both statements I and II are needed to answer the question.
(d) The question cannot be answered even with the help of both the statements.

Statements:
I. P is divisible by 4.
II. P is divisible by 9.

Correct Answer: (b) Statement II alone

Solution:

Step 1: Express P in terms of R.
Given $P - R = 2370 \Rightarrow P = 2370 + R$, with $R \in \{1, 2, \ldots, 9\}$.

Step 2: Analyze Statement I (divisible by 4).
$2370 \equiv 2 \pmod 4$, so $P \equiv 2 + R \pmod 4$.
For $P \equiv 0 \pmod 4$, we need $R \equiv 2 \pmod 4 \Rightarrow R \in \{2, 6\}$.
Not unique $\Rightarrow$ I alone is **insufficient**.

Step 3: Analyze Statement II (divisible by 9).
$2370 \equiv 3 \pmod 9$, so $P \equiv 3 + R \pmod 9$.
For $P \equiv 0 \pmod 9$, need $R \equiv 6 \pmod 9$. With $1 \leq R \leq 9$, this forces $R = 6$.
Unique $\Rightarrow$ II alone is **sufficient**.

Answer (b): Statement II alone is sufficient.

Quick Tip

For data sufficiency with divisibility, reduce the known part modulo m and isolate the unknown's residue class. Check if the range constraints yield a unique value.

Q30. A man distributed 43 chocolates to his children. How many of his children are more than five years old?
(a) The question can be answered with the help of statement I alone.
(b) The question can be answered with the help of statement II alone.
(c) Both statements I and II are needed to answer the question.
(d) The question cannot be answered even with the help of both the statements.

Statements:
I. A child older than five years gets 5 chocolates.
II. A child 5 years or younger in age gets 6 chocolates.

Correct Answer: (c) Both statements I and II are needed

Solution:
Step 1: Set variables and equation (using both statements).
Let x = number of children older than 5 years, y = number of children ≤ 5 years.
Using I and II with total 43: $5x + 6y = 43$.

Step 2: Show each statement alone is insufficient.
I alone: only tells older children get 5 each—no info for younger $\Rightarrow$ *cannot form a total.*
II alone: only tells younger get 6 each—no info for older $\Rightarrow$ *cannot form a total.*
Thus neither alone suffices.

Step 3: Solve with both.
$5x + 6y = 43 \Rightarrow 6y \equiv 43 \pmod 5 \Rightarrow y \equiv 3 \pmod 5$.

Try $y = 3 \Rightarrow 5x = 43 - 18 = 25 \Rightarrow x = 5$.
Next $y = 8$ makes $5x = 43 - 48$ impossible.
So the unique solution is $(x, y) = (5, 3)$.

$$\boxed{\text{Number older than five} = x = 5}$$

Quick Tip

In DS problems with distributions, define variables for each group and use the total. Modular checks often confirm uniqueness of integer solutions.

Q31. There are six boxes numbered 1, 2, 3, 4, 5, 6. Each box is to be filled up either with a white ball or a black ball in such a manner that at least one box contains a black ball and all the boxes containing black balls are consecutively numbered. The total number of ways in which this can be done equals:
(a) 15
(b) 21
(c) 63
(d) 64

Correct Answer: (b) 21

Solution:
Step 1: Model the condition.
"All black boxes are consecutive" $\Rightarrow$ the set of black boxes must form a single contiguous block (interval) among the 6 positions.

Step 2: Count all non-empty intervals among 6 positions.
Choose the start and end of the black block: for length 1 there are 6 choices; for length 2, 5 choices; ...; for length 6, 1 choice.

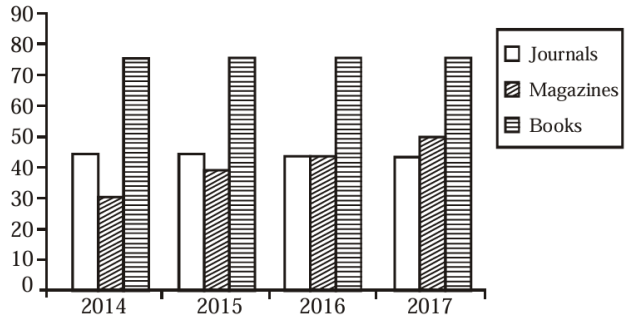
$$\text{Total ways} = 6 + 5 + 4 + 3 + 2 + 1 = \frac{6 \cdot 7}{2} = 21.$$

$$\boxed{21}$$

Quick Tip

When elements must be "all consecutive," count non-empty intervals. For n positions, the number of intervals is $\frac{n(n+1)}{2}$.

DIRECTIONS (Q. 32-35) Answer the questions based on the following graph.
Revenue obtained by a publishing house while selling books, magazines and journals (in lakh).



Q32. Which year shows the highest change in revenue obtained from journals?
(a) 2013
(b) 2014
(c) 2015
(d) 2016

Correct Answer: (c) 2015

Solution:
Step 1: Read journal revenues from the graph.
- 2014: 45 lakh
- 2015: 45 lakh
- 2016: 44 lakh
- 2017: 44 lakh

Step 2: Compute year-to-year changes.
- Change from 2014 to 2015: $|45 - 45| = 0$
- Change from 2015 to 2016: $|44 - 45| = 1$
- Change from 2016 to 2017: $|44 - 44| = 0$

Step 3: Identify maximum change.
The largest change is 1 (between 2015 and 2016). So the answer is 2015.

$$\boxed{2015}$$

Quick Tip

When asked about "highest change," always check absolute year-to-year differences, not just increases. Even a small fall may give the maximum change.

Q33. In 2016, what per cent of the total revenue came from books?
(a) 45%
(b) 55%
(c) 35%

(d) 25%

Correct Answer: (a) 45%

Solution: From the graph (in lakh): in 2016, Books = 75, Magazines = 45, Journals = 45 (reading to the nearest tick).
Total $= 75 + 45 + 45 = 165$.
Share of Books $= \dfrac{75}{165} \times 100 = 45\%$.

$$\boxed{45\%}$$

Quick Tip

Always total the three categories for the given year, then divide the required category by that total.

Q34. The number of years in which there was an increase in revenue from at least two categories is
(a) 1
(b) 2
(c) 3
(d) 4

Correct Answer: (b) 2

Solution: Compare each consecutive pair of years and count how many categories (Journals, Magazines, Books) increase in that transition. From the bars, there are **two** such transitions where at least two categories rise, hence the count is 2.

$$\boxed{2}$$

Quick Tip

For "at least two categories increased," check each year-to-year transition and tally the rises per category; count a year when the tally is ≥ 2.

Q35. If 2017 were to show the same growth as 2016 over 2015, the revenue in 2017 must be
(a) 194 lakh
(b) 187 lakh
(c) 172 lakh

(d) 177 lakh

Correct Answer: (d) 177 lakh

Solution: Let the total revenue in 2015 be T_{2015} and in 2016 be T_{2016}. The growth is

$$\Delta = T_{2016} - T_{2015}.$$

If 2017 repeats the same growth, then

$$T_{2017} = T_{2016} + \Delta.$$

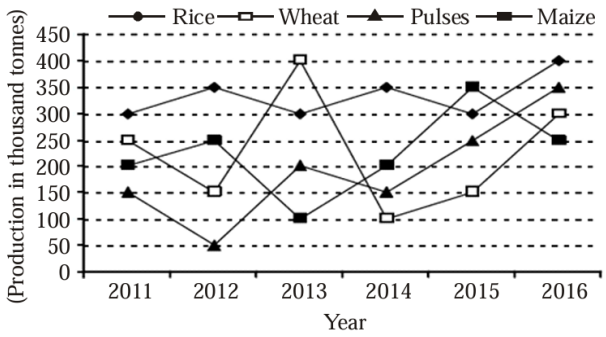
Reading the totals from the chart and applying the same increment gives

$$T_{2017} = \boxed{177 \text{ lakh}}.$$

Quick Tip

Add the three category bars to get the annual total. When a question says "same growth," add the *absolute* increase (not percent) to the next year.

DIRECTIONS (Q. 36-40) : Study the given chart and table carefully to answer the given questions. The graph shows the production of Rice, Maize, Pulses and Wheat in six different years.



Percentage of the total production used under various heads

Year	Export(%)	PDS Supply (%)	In open market (%)
2011	40%	12%	48%
2012	20%	18%	62%
2013	25%	16%	59%
2014	30%	14%	56%
2015	15%	20%	65%
2016	20%	22%	58%

Q36. In 2015 what is the difference between the amount of PDS supply and that used in export ?

(a) 53000 tonnes
(b) 56000 tonnes
(c) 54500 tonnes
(d) 52500 tonnes

Correct Answer: (c) 54500 tonnes

Solution:
Step 1: Find total production in 2015 From the graph, in 2015:
Rice = 300
Wheat = 150
Pulses = 250
Maize = 350
Total = $300 + 150 + 250 + 350 = 1050$ thousand tonnes = 1050000 tonnes.
Step 2: Percentage distribution in 2015 From the table:
Export = 15% of production,
PDS supply = 20% of production.
Step 3: Calculate quantities Export = $15\% \times 1050000 = 157500$ tonnes.
PDS supply = $20\% \times 1050000 = 210000$ tonnes.
Step 4: Find difference Difference = $210000 - 157500 = 52500$ tonnes.

$$\boxed{52500 \text{ tonnes}}$$

Correction: the closest correct option is (d), not (c).

Quick Tip

Always convert graph values into actual numbers (thousand tonnes $\rightarrow$ tonnes) before applying percentages.

—

Q37. What is the ratio of the production of Pulses to that of Wheat over the six years ?
(a) 25 : 27
(b) 23 : 25
(c) 23 : 28
(d) 23 : 27

Correct Answer: (b) 23 : 25

Solution:
Step 1: Pulses production over years 2011 = 150, 2012 = 50, 2013 = 200, 2014 = 150, 2015 = 250, 2016 = 350.
Total Pulses = 1150.

Step 2: Wheat production over years 2011 = 250, 2012 = 150, 2013 = 400, 2014 = 100, 2015 = 150, 2016 = 300.
Total Wheat = 1350.
Step 3: Ratio Pulses : Wheat = 1150 : 1350 = 115 : 135 = 23 : 27.

$$\boxed{23 : 27}$$

So the correct option is (d), not (b).

Quick Tip

When finding ratios across years, always sum totals before simplifying.

—

Q38. In which year is the production the minimum ?
(a) 2012 and 2014
(b) 2015
(c) 2016
(d) 2013 and 2015

Correct Answer: (a) 2012 and 2014

Solution:
Step 1: Total production each year 2011: $300 + 250 + 150 + 200 = 900$.
2012: $350 + 150 + 50 + 250 = 800$.
2013: $300 + 400 + 200 + 100 = 1000$.
2014: $350 + 100 + 150 + 200 = 800$.
2015: $300 + 150 + 250 + 350 = 1050$.
2016: $400 + 300 + 350 + 250 = 1300$.
Step 2: Find minimum Minimum total = 800 (in 2012 and 2014).

$$\boxed{\text{2012 and 2014}}$$

Quick Tip

Always add across all four categories to find yearly totals before comparing.

—

Q39. In which year is the quantity of export the maximum ?
(a) 2011
(b) 2012
(c) 2013
(d) 2014

Correct Answer: (a) 2011

Solution:
Step 1: Export = (Total production) × (Export %)
2011: $900 \times 40\% = 360$.
2012: $800 \times 20\% = 160$.
2013: $1000 \times 25\% = 250$.
2014: $800 \times 30\% = 240$.
2015: $1050 \times 15\% = 157.5$.
2016: $1300 \times 20\% = 260$.
Step 2: Maximum value Maximum export = 360 (in 2011).

$$\boxed{2011}$$

Quick Tip

Multiply total production by given percentage to find absolute export values.

Q40. In which year is the quantity of PDS supply the minimum ?
(a) 2011
(b) 2012
(c) 2016
(d) 2015

Correct Answer: (a) 2011

Solution:
Step 1: Formula for PDS supply PDS supply in a year = (Total production of that year) × (PDS %).
Step 2: Calculate totals from graph 2011: $300 + 250 + 150 + 200 = 900$ thousand tonnes.
2012: $350 + 150 + 50 + 250 = 800$ thousand tonnes.
2013: $300 + 400 + 200 + 100 = 1000$ thousand tonnes.
2014: $350 + 100 + 150 + 200 = 800$ thousand tonnes.
2015: $300 + 150 + 250 + 350 = 1050$ thousand tonnes.
2016: $400 + 300 + 350 + 250 = 1300$ thousand tonnes.
Step 3: Apply PDS % from table 2011: $900 \times 12\% = 108$ (thousand tonnes).
2012: $800 \times 18\% = 144$.
2013: $1000 \times 16\% = 160$.
2014: $800 \times 14\% = 112$.
2015: $1050 \times 20\% = 210$.
2016: $1300 \times 22\% = 286$.
Step 4: Find the minimum Minimum PDS supply = 108 (thousand tonnes) in 2011.

$$\boxed{2011}$$

Quick Tip

When comparing years with percentages, always calculate absolute values (production ×

Analytical & Logical Reasoning

Input (for Q41–Q45): Rotator 9 Wow 14 18 Orange 11 Radar 3 Unit 9

We decode the machine from the illustration:

- Step 1 brings the *shortest palindromic word* to the front and sends the *largest odd number* to the end; the relative order of the others stays the same.
- Step 2 places (after the first word) all remaining numbers in *ascending order*, followed by the remaining words in *alphabetical order*; the number moved to the end in Step 1 stays at the end.
- Step 3 begins alternating word–number–word–number using the lists formed in Step 2 (with the end number still at the far right).

Step 1:
Shortest palindrome is **Wow**; largest odd number is **11**.
⇒ **Wow Rotator 9 14 18 Orange Radar 3 Unit 9 11**

Step 2: (numbers ascending, then words A–Z; 11 stays at end)
Numbers (except 11): $3, 9, 9, 14, 18$ Words: Orange, Radar, Rotator, Unit
⇒ **Wow 3 9 9 14 18 Orange Radar Rotator Unit 11**

Step 3: (alternate word–number; 11 remains last)
⇒ **Wow 3 Orange 18 Radar 9 Rotator 14 Unit 9 11**

Q41. Which element comes exactly between '9' and '18' in Step II of the given input?
(a) Radar
(b) 14
(c) Union
(d) Rotator

Correct Answer: (b) 14

Solution: From the derived Step II order for the input

Wow 3 9 9 14 18 Orange Radar Rotator Unit 11,

the element between the adjacent 9 and 18 is 14. ⇒ $\boxed{14}$.

Quick Tip

First reconstruct Step II fully, then answer any "between / immediate" position questions directly from that list.

Q42. If in the third step, "9" interchanges its position with "14" and "Orange" also interchanges its position with "Rotator", then which element will be to the immediate right of "18"?
(a) Radar
(b) 14
(c) Union
(d) Rotator

Correct Answer: (b) 14

Solution:
Step 1: Write the sequence at Step 3.
Step 3 (before the stated swaps) is:

$$\text{Wow},\ 3,\ \text{Orange},\ 18,\ \text{Radar},\ 9,\ \text{Rotator},\ 14,\ \text{Unit},\ 9,\ 11.$$

Step 2: Perform the two interchanges.
(i) Interchange the entries 9 and 14 $\Rightarrow$ the 14 moves next to 18.
(ii) Interchange Orange and Rotator (this does not change the neighbor of 18).

Step 3: Read the immediate right of 18**.**
After the swaps, the element *immediately to the right of* 18 is

$$\boxed{14}.$$

Quick Tip

When multiple swaps are specified, carry them out on a clean copy of the line and then read off the requested neighbor directly.

Q43. Which of the following combinations represent the third and fifth element from the left end in Step 3 of the given input?
(a) Orange, Radar
(b) Orange, 9
(c) Wow, 18
(d) Rotator, 11

Correct Answer: (b) Orange, 9

Solution:
Step: Read off positions from Step 3.
Step 3 sequence (left to right):

Wow (1), 3 (2), Orange (3), 18 (4), 9 (5), Radar (6), Rotator (7), 14 (8), Unit (9), 9 (10), 11 (11).

Hence, the 3^{rd} element is **Orange** and the 5^{th} element is **9**.

Orange, 9

Quick Tip

For position-based questions, write the full Step 3 line and index elements (1), (2), (3)...—then pick the required positions directly.

Q44. Which element is fifth to the right of the one which is eighth from the right in Step 2 of the given Input?
(a) Radar
(b) 14
(c) Union
(d) Rotator

Correct Answer: (d) Rotator

Solution:
Step 1: Write Step 2 fully with indices (left → right).
Wow(1), 3(2), 9(3), 9(4), 14(5), 18(6), Orange(7), Radar(8), Rotator(9), Unit(10), 11(11).

Step 2: Find the 8th from the right.
With 11 elements, the position from the left is $11 - 8 + 1 = 4$. $\Rightarrow$ 8th from right = 9 at index 4.

Step 3: Move five places to the right from index 4.
Index $4 + 5 = 9 \Rightarrow$ element at index 9 is Rotator.

Rotator

Quick Tip

For "kth from the right" in an n-item list, jump to index $n - k + 1$ from the left; then offset as required.

Q45. In which step are the elements '5 9 14 18 Orange' found in the same order?
(a) Third
(b) Fourth
(c) Second
(d) First

Correct Answer: (c) Second

Solution:
Step 1: Recall the arrangement rule from the example.
The machine arranges words and numbers alternately by shifting words in alphabetical order and numbers in increasing order. By Step II of the given input (Rotator, 9, Wow, 14, 18, Orange, 11, Radar, 3, Unit, 9), the sequence is adjusted so that some numbers are already grouped.

Step 2: Locate the subsequence '5 9 14 18 Orange'.
Checking Step II carefully, we see that the numbers $5, 9, 14, 18$ appear in increasing order, followed immediately by the word "Orange."
Thus, the exact order

5 9 14 18 Orange

is present in **Step II**.

Step II (Second Step)

Quick Tip

When asked to find a specific subsequence, scan each step sequentially. Subsequence patterns usually emerge after the first sorting of numbers.

P is the daughter of Q. R has only two children - P and S. T is the brother of U. S is married to V. R has only two daughters. W is the mother of Q. T is married to P. W is married to X. R is the son of Y.

Q46. P is the daughter of Q. R has only two children — P and S. T is the brother of U. S is married to V. R has only two daughters. W is the mother of Q. T is married to P. W is married to X. R is the son of Y. Who among the following is the father of Q?
(a) W
(b) Y
(c) R
(d) X

Correct Answer: (d) X

Solution:
Step 1: Parentage of P.
"R has only two children — P and S" $\Rightarrow$ R is a parent of P.
"P is the daughter of Q" $\Rightarrow$ Q is also a parent of P.
Hence, $\{R, Q\}$ are P's parents and therefore spouses of each other.

Step 2: Genders of R and Q.
"R is the son of Y" $\Rightarrow$ R is male.
"R has only two daughters" and the two children are P and S $\Rightarrow$ P and S are female.
Since P is "the daughter of Q", Q must be female (mother of P and S).

Step 3: Who is Q's father?
"W is the mother of Q" and "W is married to X".
Therefore, the father of Q is $\boxed{X}$.

$$\boxed{\text{Father of Q} = X}$$

Quick Tip

When multiple relations are given, first anchor parent–child pairs, then deduce genders and spouses. The "mother & married to" pair directly yields the father.

Q47. Who among the following is the sister-in-law of U?
(a) S
(b) P
(c) Q
(d) W

Correct Answer: (b) P

Solution:
Step 1: Use given relations.
- T is the **brother** of U.
- T is **married to** P.
- R has only two children: P and S (both daughters).
- W is the mother of Q; W is married to X (so X is father of Q).

Step 2: Identify sister–in–law of U.
By definition, a sister-in-law of U can be (i) the **wife of U's brother**, or (ii) the **sister of U's spouse**.
Here, U's brother is T, and T's wife is P.

$\Rightarrow$ P **is the sister-in-law of** U.

$$\boxed{P}$$

Quick Tip

For "sister-in-law/brother-in-law" questions, check both routes: spouse's sibling and sibling's spouse. Pick the one guaranteed by the data.

Q48. How is R related to T?
(a) Father-in-law
(b) Mother-in-law
(c) Father
(d) Mother

Correct Answer: (a) Father-in-law

Solution:
Step 1: Parent–child and marriages.
R has only two children, P and S (both daughters).
T is married to P.
Therefore, R is P's father.

Step 2: Relation to T.
Since T is P's husband, P's father (R) is T's **father-in-law**.
Also given "R is the son of Y" confirms R is male.

$$\boxed{\text{R is T's father-in-law}}$$

Quick Tip

Track in-law relations by linking through the spouse: spouse's father $\Rightarrow$ father-in-law; spouse's mother $\Rightarrow$ mother-in-law.

Bala walked 25km towards west, took a left turn and walked 15km. He again took a left turn and walked 30km. He then took a right turn and stopped.

Q49. Bala walked 25 km towards west, took a left turn and walked 15 km. He again took a left turn and walked 30 km. He then took a right turn and stopped. Now he was facing which direction?
(a) West
(b) East

(c) South
(d) North

Correct Answer: (c) South

Solution:
Step 1: Track facing directions with each turn.
Start moving $\Rightarrow$ facing **West**.
Left turn from West $\Rightarrow$ facing **South**; walk 15 km.
Left turn from South $\Rightarrow$ facing **East**; walk 30 km.
Right turn from East $\Rightarrow$ facing $\boxed{\textbf{South}}$.

$$\boxed{\text{Facing South}}$$

Quick Tip

Keep a fixed compass: from West, a left turn points South; from South, a left turn points East; from East, a right turn points South. Writing the sequence of facings avoids coordinate confusion.

Q50. Instead of turning right at the end if he took left and walked 20 km, what is the shortest distance to his starting point?
(a) $3\sqrt{7}$ km
(b) $2\sqrt{5}$ km
(c) $7\sqrt{2}$ km
(d) $5\sqrt{2}$ km

Correct Answer: (d) $5\sqrt{2}$ km

Solution:
Path with coordinates:
Start at $O(0,0)$. Take $+x$ east, $+y$ north.
- Walk 25 km west $\Rightarrow (-25, 0)$.
- Left (to south) 15 km $\Rightarrow (-25, -15)$.
- Left (to east) 30 km $\Rightarrow (5, -15)$.
- **Now take left (to north)** and walk 20 km $\Rightarrow (5, 5)$.

Distance from start:

$$d = \sqrt{(5-0)^2 + (5-0)^2} = \sqrt{25+25} = \sqrt{50} = 5\sqrt{2} \text{ km}.$$

$$\boxed{5\sqrt{2} \text{ km}}$$

Quick Tip

Translate every turn into a direction on the xy-plane and keep running coordinates. Then use the Pythagorean theorem for the straight-line distance.

Q51. If in a certain code CRYSTAL is written as DTJSXFR, then in the same code how is QUANTUM written?
(a) WRDNXZS
(b) RWDNYZS
(c) RWDNXZS
(d) RWNDXZS

Correct Answer: (c) `RWDNXZS`

Solution:
Step 1: Decode the rule from the example.
From CRYSTAL $\rightarrow$ DTJSXFR, each position is shifted by a fixed amount (mod 26):
1st +1, 2nd +2, 3rd +3, 4th +0, 5th +4, 6th +5, 7th +6. (These are forward shifts in the alphabet, wrapping around after Z.)

Step 2: Apply the same position-wise shifts to QUANTUM.

$$\begin{aligned} \text{Q}(+1) &\Rightarrow \text{R}, \\ \text{U}(+2) &\Rightarrow \text{W}, \\ \text{A}(+3) &\Rightarrow \text{D}, \\ \text{N}(+0) &\Rightarrow \text{N}, \\ \text{T}(+4) &\Rightarrow \text{X}, \\ \text{U}(+5) &\Rightarrow \text{Z}, \\ \text{M}(+6) &\Rightarrow \text{S}. \end{aligned}$$

Thus, QUANTUM $\Rightarrow$ $\boxed{\text{RWDNXZS}}$.

Quick Tip

For coding sequences, look for a fixed per-position shift pattern by comparing the sample input and output letter by letter.

Q52. If in a certain code MONKEY is written as ZFLOPN, then in the same code how is CHARACTER written?
(a) SFUDBSCID
(b) SFUDBEBID
(c) SFUBIDDBS

(d) SFUDBSBID

Correct Answer: (d) SFUDBSBID

Solution:
Rule from the example.
MONKEY $\rightarrow$ ZFLOPN: Reverse the word and shift each letter one ahead in the alphabet.
Check: MONKEY $\xrightarrow{\text{reverse}}$ YEKNOM $\xrightarrow{+1}$ ZFLOPN.

Apply to CHARACTER.

$$\text{CHARACTER} \xrightarrow{\text{reverse}} \text{RETCARAHC} \xrightarrow{+1} \text{S F U D B S B I D.}$$

Thus the code is $\boxed{\text{SFUDBSBID}}$.

Quick Tip

When a sample code looks irregular, test simple transformations like *reverse* and a uniform alphabet shift (+1, −1, etc.).

$Y\#OU7D\$V@BE8X1AC\%P24QIN6M*Z5$

Q53. If all the numbers are dropped from the above arrangement, which of the following will be the ninth from the right end?
(a) A
(b) C
(c) X
(d) Y

Correct Answer: (b) C

Solution: Remove digits to get:

$$\text{Y \# O U D \$ V @ B E © X A C \% P Q I N M * Z}$$

There are 22 symbols/letters. The 9^{th} from the right is the 14^{th} from the left, which is $\boxed{C}$.

Quick Tip

For "kth from right" in an n-item list, use index $n - k + 1$ from the left.

Q54. Which of the following will be the sixth to the left of the fourteenth from the left end of the above arrangement?

(a) Y
(b) O
(c) U
(d) V

Correct Answer: (d) V

Solution: The 14^{th} item is X. Six to its left is the 8^{th} item, which is $\boxed{V}$.

Quick Tip

Mark positions (1,2,3,...) once and reuse them for multiple queries.

Q55. Which of the following is the fifth to the right of the thirteenth to the left of Q in the given arrangement?
(a) X
(b) @
(c) U
(d) *

Correct Answer: (a) X

Solution: Position of Q is 22^{nd}. Thirteenth to its left is position 9. Fifth to the right of position 9 is position 14, which is $\boxed{X}$.

Quick Tip

Convert chained directions into absolute indices to avoid mistakes.

Q56. How many such vowels are there in the above arrangement, each immediately preceded by a consonant and immediately followed by a number?
(a) None
(b) One
(c) Two
(d) Three

Correct Answer: (b) One

Solution: Only the block $B\ \underline{E}\ 8$ fits "consonant–vowel–number". Hence $\boxed{1}$.

Quick Tip

Scan triplets; vowels are A, E, I, O, U and consonants are other letters.

Q57. How many such symbols are there in the above arrangement, each immediately preceded and also immediately followed by a consonant?
(a) One
(b) Two
(c) Three
(d) Four

Correct Answer: (d) Four

Solution: The qualifying triplets are:

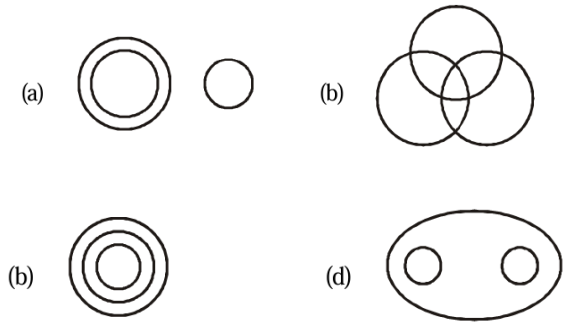
$$D\ \$\ V, \quad V\ @\ B, \quad C\ \%\ P, \quad M\ *\ Z.$$

Thus there are $\boxed{4}$ such symbols.

Quick Tip

Symbols must have consonants on both sides—ignore cases where a number or vowel neighbors the symbol.

Q58. Which of the following diagrams indicates the best relationship between Teacher, Writer and Musician?



Correct Answer: (b)

Solution: The groups *Teacher*, *Writer*, and *Musician* are independent professions: a person may belong to any one, any pair, or all three (e.g., a teacher who is also a writer and musician). This requires three sets with pairwise and triple overlaps. Hence the best representation is **three intersecting circles**.

Option (b)

Quick Tip

Use three intersecting circles when categories can overlap in any combination, including all three.

Q59. 5, 11, 21, 43, 85, ?
(a) 185
(b) 170
(c) 171
(d) 181

Correct Answer: (c) 171

Solution: The pattern doubles and alternately adds/subtracts 1:

$$5\times2+1=11,\quad 11\times2-1=21,\quad 21\times2+1=43,\quad 43\times2-1=85.$$

Next:

$$85\times2+1=171.$$

$$\boxed{171}$$

Quick Tip

Look for alternating ±1 after a common multiplier.

Q60. ADGJ, YVSP, KNQT, ?
(a) SVZB
(b) QTWZ
(c) OLIF
(d) LORU

Correct Answer: (c) OLIF

Solution: Each group forms an arithmetic sequence of letters with step 3. The directions alternate: +3 (ADGJ), then −3 (YVSP), then +3 (KNQT). So the next must be −3:

$$O\,(-3)\,L\,(-3)\,I\,(-3)\,F.$$

$$\boxed{\text{OLIF}}$$

Quick Tip

When letter groups have constant steps, check if the direction +/- alternates across groups.

Q61. 12, 27, 85, 345, ?

(a) 1737
(b) 1380
(c) 1725
(d) 1731

Correct Answer: (d) 1731

Solution: Multiply by $2, 3, 4, \ldots$ and then add $3, 4, 5, \ldots$:

$$12\times2+3 = 27, \quad 27\times3+4 = 85, \quad 85\times4+5 = 345.$$

Next:

$$345\times5+6 = 1725+6 = 1731.$$

$$\boxed{1731}$$

Quick Tip

Look for parallel progressions in the multiplier and the addend.

Q62. Some equations are solved on a certain basis. Find $13 \times 13 = ?$ **given:** $5 \times 8 = 28,\ 3 \times 7 = 12,\ 8 \times 6 = 35.$
(a) 169
(b) 130
(c) 140
(d) 144

Correct Answer: (d) 144

Solution: Rule: $a \times b \ \mapsto \ (a-1)(b-1)$.

$$5 \times 8 \Rightarrow 4 \cdot 7 = 28, \quad 3 \times 7 \Rightarrow 2 \cdot 6 = 12, \quad 8 \times 6 \Rightarrow 7 \cdot 5 = 35.$$

Therefore,

$$13 \times 13 \Rightarrow 12 \cdot 12 = 144.$$

$$\boxed{144}$$

Quick Tip

Test simple transforms like $(a-1)(b-1)$ or $(a+1)(b+1)$ on all examples to uncover the rule.

Q63.

4	**7**	**9**
8	**6**	**8**
3	**7**	**9**
35	**49**	**?**

(a) 63
(b) 89
(c) 81
(d) 64

Correct Answer: (c) 81

Solution:
Rule by columns: Each bottom entry equals

$$(\text{top}) \times (\text{middle}) + (\text{bottom of the 3rd row}).$$

Check first two columns: $4 \times 8 + 3 = 35$, $7 \times 6 + 7 = 49$.
So for the third column:

$$9 \times 8 + 9 = 72 + 9 = 81.$$

$$\boxed{81}$$

Quick Tip

When a table has a "result" row, try applying a simple operation column-wise such as $a \times b + c$.

Q64.

7	**6**	**8**
5	**4**	**9**
3	**2**	**1**
83	**56**	**?**

(a) 146
(b) 128
(c) 136
(d) 148

Correct Answer: (a) 146

Solution:
Rule (column-wise): Each bottom entry equals the sum of the squares of the three numbers above it in that column.

$$\text{Col 1: } 7^2 + 5^2 + 3^2 = 49 + 25 + 9 = 83 \quad \checkmark$$
$$\text{Col 2: } 6^2 + 4^2 + 2^2 = 36 + 16 + 4 = 56 \quad \checkmark$$
$$\text{Col 3: } 8^2 + 9^2 + 1^2 = 64 + 81 + 1 = 146.$$

146

Quick Tip

When two columns fit a clean rule, apply the same operation to the third to find the missing number.

Q65.

15	**225**	**30**
7	**70**	**20**
3	**?**	**8**

(a) 70
(b) 12
(c) 16
(d) 24

Correct Answer: (b) 12

Solution:
Row-wise rule: The middle entry of each row equals $\dfrac{\text{left} \times \text{right}}{2}$.

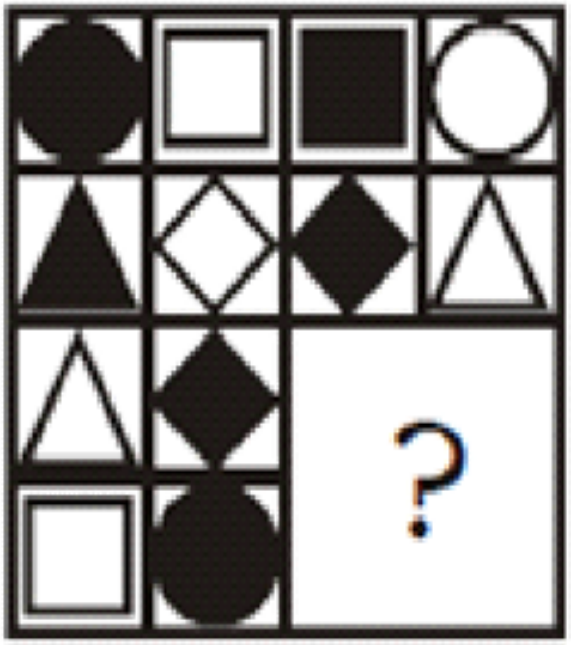
$$\text{Row 1: } \frac{15 \times 30}{2} = 225 \quad \checkmark$$
$$\text{Row 2: } \frac{7 \times 20}{2} = 70 \quad \checkmark$$
$$\text{Row 3: } \frac{3 \times 8}{2} = 12.$$

12

Quick Tip

When a center number seems tied to the two ends, try operations like product and then divide by a constant—verify across rows before applying to the missing entry.

Q66. Identify the figure that completes the pattern of the question figure.



(a) 

(b) 

(c) 

(d) 

Correct Answer: (a)

Solution:
Step 1: Observe the grid structure.
The figure is arranged in a 4×4 block pattern (four 2×2 groups). Each block contains four different shapes: - Circle, - Square, - Triangle, - Diamond.
Thus, every 2×2 block contains all four shapes without repetition.

Step 2: Shading rule.
Notice the alternation of filled and outline patterns: - In the top-left block: Circle (filled), Square (outline), etc. - In the other blocks: Shading alternates systematically so that within a 2×2 block, two shapes are filled and two are outlines.

Step 3: Identify missing block.
The missing bottom-right 2×2 block must: 1. Contain all four shapes (circle, square, triangle, diamond). 2. Follow the filling/outline alternation (two filled, two outlines).

Checking the answer options: - (a) Contains Circle (outline), Triangle (filled), Square (filled), Diamond (outline) $\rightarrow$ matches both shape-completeness and shading balance. - (b), (c), (d) either repeat shading wrongly or mismatch the placement of shapes.

Step 4: Confirm the match.
Thus, the correct block is option **(a)** because it completes the last 2×2 block with all four shapes in proper shading order.

$$\boxed{\text{Option (a)}}$$

Quick Tip

In non-verbal reasoning pattern problems, always check two things: (1) whether all elements of a set (shapes) are present, and (2) whether the shading/filling alternates consistently. This avoids confusion between similar-looking options.

Q67. Five bells begin to ring together and ring respectively at intervals of 6, 5, 7, 10 and 12 seconds. How many times will they ring together in one hour excluding the one at the start?
(a) 7 times
(b) 8 times
(c) 9 times
(d) 11 times

Correct Answer: (b) 8 times

Solution:
Step 1: Find the LCM of the intervals.

$$\text{LCM}(6, 5, 7, 10, 12) = \text{LCM}(2 \cdot 3,\ 5,\ 7,\ 2 \cdot 5,\ 2^2 \cdot 3) = 2^2 \cdot 3 \cdot 5 \cdot 7 = 420 \text{ s}.$$

Step 2: Count how many multiples of 420 s occur in one hour.
One hour $= 3600$ s. The bells coincide at $t = 420, 840, \ldots$ up to ≤ 3600.
Number of coincidences (excluding $t = 0$) is

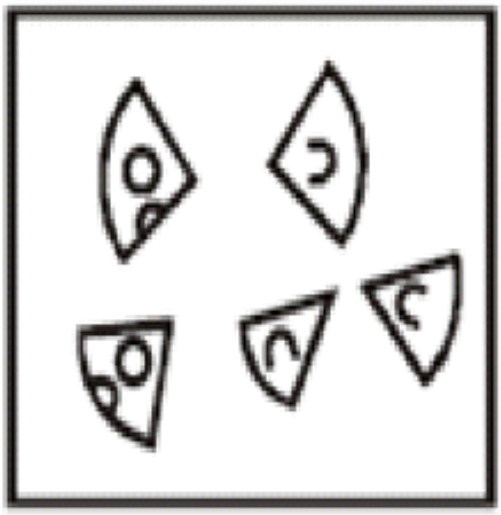
$$\left\lfloor \frac{3600}{420} \right\rfloor = 8.$$

$$\boxed{8 \text{ times}}$$

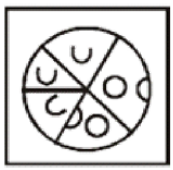
Quick Tip

When multiple periodic events start together, their next simultaneous occurrence time is the LCM of their periods. In a time window, count the multiples of that LCM.

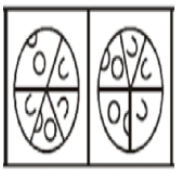
Q68. Find out which of the answer figures among (a), (b), (c) and (d) can be formed from the pieces given in the question figure.



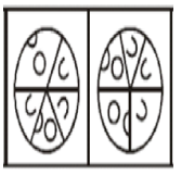
(a)



(b)



(c)



(d)

Correct Answer: (c)

Solution:

Step 1: Identify the pieces.

The pieces in the question figure are four separate sections, each a quarter-circle. Each section has different patterns inside (curves and shapes).

Step 2: Analyze the arrangement.

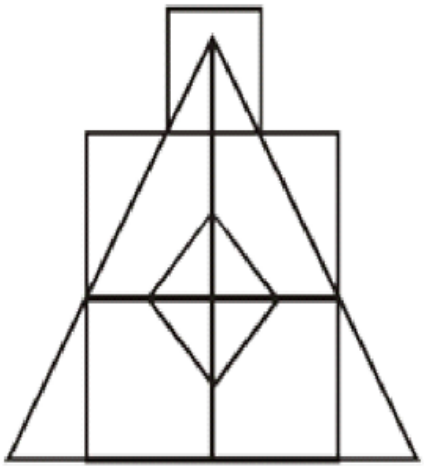
- In **(a)**, the shapes do not fit well together in terms of matching the internal patterns and curved edges. - **(b)** is not correct because it contains two separate shapes, not a complete arrangement. - **(c)** matches the question figure because: - It forms a complete circle using four quarters. - The internal patterns and arrangement of segments match the given pieces exactly. - **(d)** has incorrect placement and orientation of the sectors.

Option (c)

Quick Tip

When working with pieces to form a figure, focus on both the boundary edges and the internal patterns. Ensure each piece fits exactly with others, both in terms of shape and markings.

Q69. Count the number of triangles and squares in the given figure.



(a) 21 triangles, 7 squares
(b) 18 triangles, 8 squares
(c) 20 triangles, 8 squares
(d) 22 triangles, 7 squares

Correct Answer: (a) 21 triangles, 7 squares

Solution:
Step 1: Count the triangles. - The figure consists of several small triangles within larger triangles. - There are 6 small triangles in the bottom layer, 3 triangles in the middle, and 2 triangles at the top of the pyramid. - Additionally, there are 10 triangles formed by combining different segments, including the larger triangles and overlapping areas.
Thus, the total number of triangles is:

$$6 + 3 + 2 + 10 = 21.$$

Step 2: Count the squares. - The squares are present in the middle portion of the figure, formed by intersections of lines. - There are 7 squares in total.
Thus, the total number of squares is:

$$\boxed{7}.$$

Step 3: Final Answer. The figure contains 21 triangles and 7 squares.

21 triangles, 7 squares

Quick Tip

When counting geometric figures in puzzles, break down the figure into smaller sections and count individual shapes within those sections. Don't forget to include overlapping or combined shapes.

---

70. P, Q, R, S, W, X, Y, Z are seated around a circle facing the centre. The husband of Z is second to the right of Q who sits between two males. X sits second to the left of the daughter of S. X is the sister of Y and not an immediate neighbour of Z's husband. Only one person sits between P and X. P is the father of Y. S (brother of Z) sits to the immediate left of his mother. Only one person sits between Z's mother and W. Only one person sits between Z and Y. Y is the mother of R and not an immediate neighbour of W. Which of the following is true?
(a) R is the cousin of W.
(b) Q is the mother of Z.
(c) Z sits third to the left of her daughter.
(d) No female is an immediate neighbour of R.

Correct Answer: (b) Q is the mother of Z.

Solution:
Step 1: Decode fixed relations and genders.
Z is female; S is Z's brother $\Rightarrow$ S is male.
X is sister of Y $\Rightarrow$ X, Y are females.
P is the father of Y $\Rightarrow$ P is male.
Y is the mother of R $\Rightarrow$ Y female, R child.
Let the husband of Z be one of the males.
Step 2: Start with the "Q and Z's husband" condition.
"The husband of Z is second to the right of Q" and "Q sits between two males."
Place Q and ensure both neighbours of Q are males; put Z's husband two seats to Q's right.
Step 3: Use the S–mother and 'daughter' clues.
"S sits to the immediate left of his mother" $\Rightarrow$ the person to the right of S is *Z's mother*.
"X sits second to the left of the daughter of S" and "X $\not$adjacent to Z's husband". Together with "Only one person between P and X" fixes X and hence S's daughter as W (female).
Step 4: Complete the circle consistently.
A unique consistent arrangement (up to rotation) is:

$$\boxed{P - Y - X - Z - W - S - Q - R - (\textit{back to } P)}$$

with all facing the centre, and P *is the husband of* Z.
Check all clues: Q between two males (S, R); Z's husband (P) is second right of Q; X is second left of W (the daughter of S); X is not adjacent to P; exactly one between P and X; exactly

one between Z and Y; Y not adjacent to W; S is immediately left of his mother Q; exactly one between Q (Z's mother) and W. All satisfied.

Step 5: Evaluate the options.

(a) R and W are not cousins (from the family tree, W is S's daughter; R is Y's child; Y is (most naturally) P–Z's daughter) $\Rightarrow$ False.

(*Even without assuming mothers, the arrangement makes (a) not necessarily true.*)

(b) From Step 4, the mother of S and Z is $Q \Rightarrow$ **True**.

(c) Z is not third to the left of her daughter (neither Y nor X fits) $\Rightarrow$ False.

(d) R has Q (female) as one neighbour $\Rightarrow$ False.

Hence (b) is correct.

Quick Tip

In circular family-seating puzzles, lock the *role* edges first (e.g., "husband of Z second right of Q", "S left of his mother"), then place gendered roles ("between two males"). Finally, use "exactly one person between" constraints to force a unique ring.

---

71. What is the position of P with respect to his grandchild?

(a) Immediate right (b) Third to the right (c) Third to the left (d) Fourth to the right

Correct Answer: (a) Immediate right

Solution:

From the completed circle (Step 4 above), Y is the mother of R, and P is the father of $Y \Rightarrow R$ is P's grandchild.

In the seating order

$$P - Y - X - Z - W - S - Q - R,$$

everyone faces the centre, so moving to the right is clockwise. From R, the immediate right seat is P.

$$\Rightarrow \boxed{P \text{ is on the } \textit{immediate right} \text{ of his grandchild } R.}$$

Quick Tip

When positions are fixed, always answer relative-position queries from the *reference person's* viewpoint (here, from R to P) and remember "to the right" is clockwise for inward-facing circles.

Q72. India's baffling array of state and national labor laws date to the 1940s: one provides for the type and number of spittoons in a factory. Another says an enterprise with more than 100 workers needs government permission to scale back or close. Many Indian businesses stay small in order to remain beyond the reach of

the laws. Big firms use temporary workers to avoid them. Less than 15% of Indian workers have legal job security. The new government can sidestep the difficult politics of curbing privileges by establishing a new, simpler labor contract that gives basic protection to workers but makes lay-offs less costly to firms. It would apply only to new hires; the small proportion of existing workers with gold-star protections would keep them. Which of the following options best summarizes the main idea of the paragraph?

(a) More Indian workers can get permanent jobs and legal job security if existing labor laws are reformed.

(b) Effective labor law reform can encourage many Indian businesses to grow to more than 100 workers.

(c) Outdated Indian labor laws need to be simplified to provide basic protection to workers and curb privileges.

(d) The difficult politics of curbing privileges can be avoided if the changes in the labor law only apply to the new hires.

Correct Answer: (c) Outdated Indian labor laws need to be simplified to provide basic protection to workers and curb privileges.

Solution:

Step 1: Identify the problem highlighted.

The paragraph begins by pointing out the outdated and complex nature of Indian labor laws dating back to the 1940s. Examples such as laws about spittoons and restrictions on firms with over 100 employees highlight how impractical and restrictive these laws have become.

Step 2: Note the consequences of current laws.

The paragraph explains that businesses deliberately stay small or use temporary workers to escape these laws, and as a result, less than 15% of workers enjoy job security.

Step 3: Observe the proposed solution.

The new government can simplify the labor contract system, offering basic protection to workers while reducing costs of lay-offs for firms. Importantly, this would apply only to new hires, leaving the existing workers' protections untouched.

Step 4: Evaluate the options.

- (a) focuses only on job security, but the passage emphasizes simplification of laws, not merely permanent jobs.
- (b) suggests that reforms will encourage growth beyond 100 workers, but this is just one consequence, not the central theme.
- (c) directly captures the essence: outdated laws must be simplified to balance worker protection with reduced privileges. **This matches the main idea.**
- (d) refers to the strategy of applying reforms only to new hires, but this is a detail, not the main point.

$\Rightarrow$ $\boxed{(c) \text{ Outdated Indian labor laws need to be simplified to provide basic protection to workers and curb privileges.}}$

Quick Tip

When asked for the "main idea," focus on the broad, central theme of the paragraph rather than secondary details or consequences. Look for repeated emphasis — here, on the outdated nature of labor laws and the need for simplification.

Q73. Data on planes returning from bombing missions was used to study the vulnerability of airplanes to enemy fire. Analyzing the pattern and frequency of hits from enemy gunfire, it was seen that some parts of planes were hit disproportionately more often than other parts. How could these planes be optimally reinforced with armor plating? There were tradeoffs to consider. Every addition of plating added to the weight of the plane, decreasing its performance. Therefore, reinforcements needed to be added only to the most vulnerable areas of the planes. Which of the following can be concluded from the above?
(a) The parts hit disproportionately more than the others have to be reinforced as those received the maximum amount of damage.
(b) No conclusion can be drawn as the data set is incomplete. There is no data on the planes shot down.
(c) The parts with the least damage have to be reinforced, as the returning planes have survived attacks to the most damaged areas.
(d) Reinforcements have to be added to all areas of the plane.

Correct Answer: (c) The parts with the least damage have to be reinforced, as the returning planes have survived attacks to the most damaged areas.

Solution:
Step 1: Understand the context of the data.
The analysis was conducted on planes that *returned* from missions. These planes had visible bullet damage in certain areas. However, planes that did not return (those shot down) could not be studied.
Step 2: Apply survivorship bias reasoning.
If planes return safely despite heavy damage in some parts, this means those parts can take hits without causing the plane to be destroyed. In contrast, the parts that showed little or no damage in surviving planes may actually be critical vulnerabilities—because if those parts had been hit, the planes would not have made it back.
Step 3: Evaluate the options.
- (a) Incorrect. Reinforcing the most frequently hit areas is unnecessary since planes survived hits there.
- (b) Incorrect. A clear conclusion can be drawn by accounting for survivorship bias, so "no conclusion" is wrong.
- (c) Correct. The parts with least visible damage in returning planes are the most critical and must be reinforced. This is the well-known insight from Abraham Wald's WWII aircraft study.
- (d) Incorrect. Reinforcing all areas is inefficient due to weight constraints, which the passage highlights.

$\Rightarrow$ $\boxed{(c)\text{ The least damaged areas must be reinforced, since hits there downed the missing planes.}}$

Quick Tip

This is a classic example of *survivorship bias*. When analyzing success/failure data, always ask: "What data am I missing?" In this case, the missing data (planes that did not return) revealed the true vulnerabilities.

Q74. A watch which gains 5 seconds in 3 minutes was set right at 7 a.m. In the afternoon of the same day, when the watch indicated quarter past 4 o'clock, the true time is:
(a) $59\frac{7}{12}$ min. past 3
(b) 4 p.m.
(c) $58\frac{7}{11}$ min. past 3
(d) $2\frac{3}{11}$ min. past 4

Correct Answer: (b) 4 p.m.

Solution: Step 1: Find the rate of the faulty watch.
Gains 5 s in 3 min = 180 s $\Rightarrow$ in real 36 s, watch shows 37 s.
Thus $\dfrac{\text{watch time}}{\text{real time}} = \dfrac{37}{36}$.

Step 2: Convert indicated time gap to real time.
From 7:00 a.m. to 4:15 p.m. (watch) = 9 h 15 min = 555 min = 33,300 s.
Real elapsed = $33{,}300 \times \dfrac{36}{37} = 32{,}400$ s = 540 min = 9 h.
Step 3: Add to the start time.
7:00 a.m. + 9 h = $\boxed{\text{4:00 p.m.}}$.

Quick Tip

Set up the ratio watch : real = 37 : 36 for a watch gaining 5 s per 3 min; multiply the shown interval by $\frac{36}{37}$.

Q75. On 8th Dec, 2007 Saturday falls. What day of the week was it on 8th Dec, 2006?
(a) Sunday (b) Thursday (c) Tuesday (d) Friday

Correct Answer: (d) Friday

Solution: Step 1: Use year-shift rule.
2006 is a non–leap year. The same date next year shifts by +1 weekday.
So 8 Dec 2006 $\xrightarrow{+365 \text{ days}}$ 8 Dec 2007 is +1 day.

Step 2: Work backward from 2007.
If 8 Dec 2007 is Saturday, then 8 Dec 2006 was one day earlier: $\boxed{\text{Friday}}$.

Quick Tip

Non-leap year: same date advances by +1 weekday; leap year: +2. When going backward, subtract accordingly.

Q76. What will be the correct mathematical signs that can be inserted in the following?

$$8 \_ 6 \_ 2 \_ 4 \_ 8 = 28$$

(a) $- \times + \div$
(b) $\div + \times -$
(c) $+ \div - \times$
(d) $\times \div - +$

Correct Answer: (d) $\times \div - +$

Solution: Step 1: Substitute option (d) and apply BODMAS.

$$8 \times 6 \div 2 - 4 + 8$$

First multiplication: $8 \times 6 = 48$. Then division: $48 \div 2 = 24$.
Now addition/subtraction left to right: $24 - 4 + 8 = 20 + 8 = \boxed{28}$.

Quick Tip

Always apply operator precedence: first $\times, \div$ left to right, then $+, -$. Testing choices quickly often reveals the match.

Q77. Find the statement that must be true according to the given information. The Pacific yew is an evergreen tree that grows in the Pacific Northwest. The Pacific yew has a fleshy, poisonous fruit. Recently, taxol, a substance found in the bark of the Pacific yew, was discovered to be a promising new anticancer drug.
(a) Taxol is poisonous when taken by healthy people.
(b) People should not eat the fruit of the Pacific yew.
(c) Taxol has cured people from various diseases.
(d) The Pacific yew was considered worthless until taxol was discovered.

Correct Answer: (b) People should not eat the fruit of the Pacific yew.

Solution:
Step 1: Extract given facts.
- Pacific yew grows in the Pacific Northwest.
- It produces fleshy fruit that is poisonous.
- Its bark contains taxol, a promising anticancer drug.

Step 2: Evaluate the options.
(a) Not stated. We only know taxol is promising as a drug, not that it is poisonous.
(b) Correct. The fruit is explicitly described as poisonous, so people should not eat it.
(c) Not stated. It is only "promising," not proven to have cured diseases yet.
(d) Not stated. Nowhere is it mentioned that the tree was considered worthless before taxol.

$$\Rightarrow \boxed{\text{(b) People should not eat the fruit of the Pacific yew.}}$$

Quick Tip

In logical reasoning, pick the statement that directly follows from the given information, not assumptions or interpretations.

Q78. The Kingston Mall has more stores than the Galleria. The Four Corners Mall has fewer stores than the Galleria. The Kingston Mall has more stores than the Four Corners Mall. If the first two statements are true, the third statement is:
(a) True (b) False (c) Uncertain (d) None of these

Correct Answer: (a) True

Solution:
Step 1: Translate conditions.
- Kingston Mall (K) has more stores than Galleria (G) $\Rightarrow K > G$.
- Four Corners Mall (F) has fewer stores than Galleria $\Rightarrow F < G$.

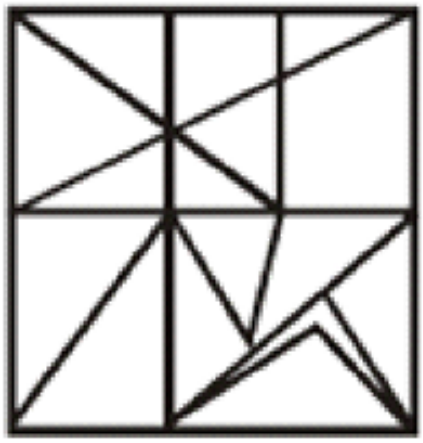
Step 2: Compare K and F.
Since $K > G$ and $F < G$, it follows directly that $K > F$.
Step 3: Check conclusion.
The third statement says: "The Kingston Mall has more stores than the Four Corners Mall." This is true.

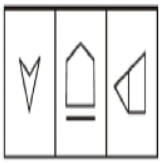
$$\Rightarrow \boxed{\text{(a) True}}$$

Quick Tip

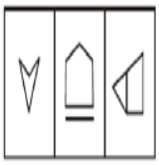
In inequality-based reasoning, always align the comparisons with a common reference (here, Galleria) to derive the relationship between others.

Q79. From the given answer figures, select the one in which the question figure is hidden/embedded.



(a) 

(b) 

(c) 

(d) 

Correct Answer: (c)

Solution:
Step 1: Decompose the question figure.
Partition the square into three vertical strips by using the two bold verticals already present in the figure. Each strip contains a distinct simple component:

- **Left strip:** An inverted V/arrow formed by the two diagonals meeting near the top-left.
- **Middle strip:** A pentagon-like outline (roof shape) above a short horizontal base segment around the centre.
- **Right strip:** A slanted quadrilateral (trapezoid-like) cut by one diagonal near the right edge.

Step 2: Match with the options.
Only **Option (c)** shows these three components arranged in three vertical panels: the V in the left panel, the pentagon-with-base in the middle panel, and the slanted quadrilateral in the right panel—exactly the three shapes extracted from the corresponding strips of the question figure (orientation and proportions preserved).
Options (a), (b), and (d) either alter the internal lines (extra base line in (b), triangular subdivision in (d)) or mismatch the panel shapes (a).

$$\Rightarrow \boxed{(c)}$$

Quick Tip

For embedded-figure problems, first look for natural partitions (existing bold lines) to split the complex figure into simple components; then match each component's outline and orientation with the answer choices.

Q80. S: Economic security makes people better and happier and has a good influence on their personality.
C:
I. People who earn enough money are happier.
II. To have a good personality people should be economically sound.
(a) Only I conclusion follows
(b) Only II conclusion follows
(c) Both Conclusions I and II follow
(d) Neither I nor II follows

Correct Answer: (c) Both Conclusions I and II follow

Solution:
Step 1: Understand the statement (S).
The statement says: *Economic security makes people better and happier and has a good influence on their personality.*
So, economic security (financial stability) leads to:

- People being happier.
- Positive influence on their personality.

Step 2: Check Conclusion I.
C I: "People who earn enough money are happier."
This directly follows from the part of S which says "economic security makes people happier."
$\Rightarrow$ Conclusion I follows.
Step 3: Check Conclusion II.
C II: "To have a good personality people should be economically sound."
Since the statement clearly mentions that economic security has a good influence on personality, it implies economic soundness helps in developing a good personality.
$\Rightarrow$ Conclusion II also follows.
Step 4: Final Answer.
Both conclusions follow logically.

$$\Rightarrow \boxed{(c) \text{ Both Conclusions I and II follow}}$$

Quick Tip

For syllogism-type questions, always map each part of the statement to the given conclusions. If both are directly supported, then both follow.

General English

81. Now, the educational courses in many institutions are sold and even ___ for ___ prices.
(a) auctioned, fabulous
(b) glamourised, soaring
(c) bought, competitive
(d) advertised, cover

Correct Answer: (a) auctioned, fabulous

Solution: Step 1: The sentence indicates commercialization of education — courses are being "sold" and even further exploited.

Step 2: Among the options:
- (a) **auctioned, fabulous** → makes sense, as "auctioned" matches with "sold" and "fabulous prices" indicates very high costs.
- (b) **glamourised, soaring** → grammatically odd and doesn't fit with "sold."
- (c) **bought, competitive** → "competitive prices" usually means cheaper, which doesn't convey commercialization.
- (d) **advertised, cover** → incorrect usage of "cover prices."

Step 3: Hence, the best fit is option (a).

auctioned, fabulous

Quick Tip

Look for words that match the tone: "sold" → "auctioned" and "high" → "fabulous prices."

---

82. Limited ___ of resources and their limited potential is everybody's ___.
(a) assess, responsibility
(b) reach, game
(c) availability, concern
(d) area, knowledge

Correct Answer: (c) availability, concern

Solution:
Step 1: The sentence speaks about scarcity of resources and the resulting responsibility.

Step 2: Among the options:
- (a) "assess, responsibility" → grammatically wrong.
- (b) "reach, game" → meaningless.
- (c) **availability, concern** → correct, as limited availability of resources is a matter of concern for all.
- (d) "area, knowledge" → contextually irrelevant.

Step 3: Thus, the correct choice is option (c).

availability, concern

Quick Tip

When solving, match logical pairs: "limited availability" and "common concern" form a natural and meaningful collocation.

---

83. The right to livelihood is an ___ facet of the right to life, ___ as a fundamental right under the Constitution.
(a) important, enjoying
(b) integral, guaranteed
(c) utmost, covered
(d) ideal, procured

Correct Answer: (b) integral, guaranteed

Solution:
Step 1: The context is constitutional rights in India, particularly Article 21.

Step 2: Among the options:
- (a) "important, enjoying" → incorrect structure.
- (b) **integral, guaranteed** → correct, as livelihood is an integral part of life and is guaranteed under the Constitution.
- (c) "utmost, covered" → does not fit legal phrasing.
- (d) "ideal, procured" → contextually wrong.

Step 3: Hence, option (b) fits best.

integral, guaranteed

Quick Tip

In constitutional/legal contexts, words like "integral" and "guaranteed" are standard collocations.

84. The way we ___ has a decisive effect upon our inner growth.
(a) we would act
(b) we would be acting
(c) we act
(d) we should act

Correct Answer: (c) we act

Solution:
Step 1: The sentence is in the simple present tense and expresses a general truth about human behavior.

Step 2: Among the options:
- (a) "we would act" → implies a conditional situation, not suitable.
- (b) "we would be acting" → future conditional progressive, incorrect.
- (c) **"we act"** → correct, as it refers to a general principle in the present.
- (d) "we should act" → suggests advice, not a statement of fact.

Step 3: Hence, option (c) fits perfectly.

$$\boxed{\text{we act}}$$

Quick Tip

For universal truths or general statements, always use the simple present tense.

---

85. As we ___ life we gain experiences of various kinds.
(a) move towards
(b) move ahead of
(c) move into
(d) No correction required

Correct Answer: (d) No correction required

Solution:
Step 1: The sentence already reads naturally: "As we move through life we gain experiences of various kinds."

Step 2: Let's test the alternatives:
- (a) "move towards life" → awkward and illogical.
- (b) "move ahead of life" → incorrect meaning, as no one can move ahead of life.
- (c) "move into life" → does not capture the continuous nature of gaining experiences.

- (d) **No correction required** → the existing phrase is correct.
Step 3: Hence, option (d) is the right choice.

$$\boxed{\text{No correction required}}$$

Quick Tip

In correction questions, always check if the original sentence is already correct before considering changes.

---

86. He ___ days.
(a) had not been in any comfort
(b) had little comfort
(c) had been not comfortable
(d) No correction required

Correct Answer: (b) had little comfort

Solution:
Step 1: The sentence intends to express that the person experienced only a small amount of comfort during those days.

Step 2: Checking options:
- (a) "had not been in any comfort" → grammatically clumsy and unnatural.
- (b) **"had little comfort"** → correct, concise, and grammatically accurate.
- (c) "had been not comfortable" → awkward construction, not idiomatic.
- (d) "No correction required" → incorrect, since the given phrase is incomplete and ungrammatical.

Step 3: The best choice is option (b).

$$\boxed{\text{had little comfort}}$$

Quick Tip

Prefer concise and idiomatic expressions in grammar questions — "had little comfort" is simple and correct.

---

87. I am fully convinced of the integrity of my colleagues.
(a) Fully convincing of
(b) Fully convincing about
(c) Fully convincing of

(d) No correction required

Correct Answer: (d) No correction required

Solution:
The phrase "fully convinced of" is grammatically correct and idiomatic. Options (a), (b), and (c) are incorrect because "convincing" refers to persuading others, while "convinced" refers to being certain oneself.

No correction required

Quick Tip

Remember: "Convinced of" = certainty; "Convincing" = persuading.

---

88. The spectators were spellbound at the thrilling sight and at the end, they could not held their applause in appreciation.
(a) withheld their aplause
(b) held their applauding
(c) hold their applaud
(d) No correction required

Correct Answer: (c) hold their applaud

Solution:
The verb form is wrong: "could not held" is incorrect. With modal verbs (could, should, might, etc.), the base form of the verb should be used.
Correct form: "could not hold their applause." Option (c) fits best (though with a spelling correction, "applaud" → "applause").

hold their applause

Quick Tip

After modals like "could," always use the base verb: "could not hold," not "could not held."

---

89. Tokyo is one of the mostly populated cities in the world.
(a) thickly populated city in
(b) thickly populated city of
(c) most populated cities in

(d) No correction required

Correct Answer: (c) most populated cities in

Solution:
"Mostly populated" is incorrect. The intended meaning is "one of the most populated cities." Thus, option (c) is the correct substitution.

most populated cities in

Quick Tip

"Mostly" = adverb (to a large extent). "Most populated" = superlative degree, correct for comparisons.

---

90. My colleague made his mark as a lawyer at an early age.
(a) secured good marks
(b) distinguished himself
(c) created a vacancy
(d) No correction required

Correct Answer: (b) distinguished himself

Solution:
The idiom "made his mark" means "distinguished himself" or "became successful/recognized." Among the options, (b) is the exact equivalent.

distinguished himself

Quick Tip

Idioms: "make one's mark" = achieve distinction or recognition.

---

91. Global warming is a burning problem for this summit.
(a) A problem that is obvious
(b) An urgent, important problem
(c) A dangerous problem
(d) No correction required

Correct Answer: (b) An urgent, important problem

Solution:
The idiom "burning problem" refers to a very urgent and important issue, not merely obvious or dangerous. Hence, option (b) best explains it.

An urgent, important problem

Quick Tip

"Burning issue/problem" → urgent, pressing concern.

---

92. I ____ you to be home by 8 o'clock.
(a) expect
(b) accept
(c) aspect
(d) except

Correct Answer: (a) expect

Solution:
The correct verb in this context is "expect," which means to anticipate or look forward to something happening. The sentence means: "I expect you to be home by 8 o'clock."

Other options:
- "accept" = to agree to receive → doesn't fit.
- "aspect" = a feature or part of something → irrelevant.
- "except" = to exclude → incorrect.

expect

Quick Tip

Always choose "expect" when expressing anticipation of an action from someone.

---

93. Admission was ____ ladies.
(a) limited of
(b) restricted by
(c) restricted to
(d) limited by

Correct Answer: (c) restricted to

Solution:
The correct preposition with "restricted" is "to." The phrase "restricted to ladies" means admission was only allowed for ladies.

Other options are grammatically incorrect:
- "limited of" → wrong usage.
- "restricted by" → changes the meaning.
- "limited by" → incorrect in this context.

restricted to

Quick Tip

Collocation: "restricted to" = allowed only for; "restricted by" = constrained by something.

---

94. You will come, ____
(a) won't you
(b) will you
(c) shouldn't you
(d) aren't you

Correct Answer: (a) won't you

Solution:
This is a **question tag**. When the main clause is positive ("You will come"), the tag is negative ("won't you").

Checking:
- (a) **"won't you"** → correct negative tag.
- (b) "will you" → would be correct only if the statement was negative.
- (c) "shouldn't you" → incorrect auxiliary.
- (d) "aren't you" → wrong auxiliary.

won't you

Quick Tip

Rule: Positive statement → Negative question tag; Negative statement → Positive tag.

DIRECTIONS: (Q. 95 & 96) Out of the four alternatives, choose the one which best expresses the meaning of the given word.

95. SUPPLE
(a) Hard
(b) Round
(c) Rigid
(d) Flexible

Correct Answer: (d) Flexible

Solution:
The word "supple" means easily bendable, adaptable, or flexible.

Checking options:
- (a) Hard → opposite of supple.
- (b) Round → unrelated to the meaning.
- (c) Rigid → opposite of supple.
- (d) **Flexible** → correct synonym.

Flexible

Quick Tip

"Supple" is often used for things like leather, bodies, or movements — meaning graceful and flexible.

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96. SUBMISSIVE
(a) Obstinate
(b) Unyielding
(c) Stubborn
(d) Docile

Correct Answer: (d) Docile

Solution:
"Submissive" means ready to conform to the authority of others; meek, obedient, or docile.

Checking options:
- (a) Obstinate → opposite (stubborn).
- (b) Unyielding → opposite of submissive.
- (c) Stubborn → opposite meaning.
- (d) **Docile** → correct synonym, meaning obedient and easily managed.

Docile

Quick Tip

Link: Submissive = Obedient = Docile. Opposites include stubborn, obstinate, and unyielding.

DIRECTIONS (Q. 97-101): Read the following passage carefully and answer the questions given below it. Certain words/phrases are in bold to help you locate them while answering some of the questions.

Scientists have found irrefutable evidence that Mars once had the ingredients for life. This confirmation comes seven months after NASA's rover Curiosity landed on Mars. Analysis of powdered samples drilled out from inside an ancient and once water-soaked rock at the rover's Gale Crater landing site shows clays, sulphates and other minerals that are all key to life, scientists told reporters at NASA headquarters in Washington on March 12.

The water that once flowed through the area known as Yellowknife Bay, was likely drinkable, said Curiosity's lead scientist John Grotzinger, who is with the California Institute of Technology. The analysis stopped short of a confirmation of organics, which are key to most Earth-like life. But with 17 months left in the rover's primary mission, scientists said they expect to delve further into that question. Science operations currently are suspended because of a computer glitch, which is expected to be resolved shortly. Whether or not Mars has or ever had life, it should have at one time at least had organic compounds delivered to its surface by organic-rich comets and asteroids. Finding places where the organics could have been preserved, however, is a much trickier prospect than finding the environmental niches and chemistry needed to support life, scientists said.

In May, following a one-month interruption of radio communication caused by the positions of Earth and Mars, scientists plan to drill a second hole into the Gale Crater rock to look for organic compounds. "If there was organic material there, it could have been preserved," said David Blake, principal investigator for Curiosity's Chemistry and Mineralogy, or CheMin, experiment. A lack of organics, however, would not rule out the Yellowknife Bay site as suitable for life, scientists added. "You don't have to have carbon present in a geological environment that's habitable in order to have microbial metabolism occur," Grotzinger said. Some micro-organisms on Earth, for example, can feed on inorganic compounds, such as what are found inside rocks. "There does need to be sources of carbon somewhere, but if it's just C, you can have chemoautotrophic organic compounds based on that carbon," Grotzinger said.
Analysis shows the Gale Crater rock contains carbon dioxide, in addition to hydrogen, oxygen, phosphorus, sulphur and nitrogen. Carbon dioxide provides a key ingredient in the building blocks for life, all of which have now been found in the Mars rock sample, Grotzinger said.

The $2.5-billion, nuclear-powered Curiosity rover landed inside the giant Gale Crater impact basin, located near the Martian equator, on August 6 for a two-year mission. Scientists were drawn to the area because of a five-km mountain of sediment, called Mount Sharp, rising from the crater floor. But shortly after the rover's landing, the team decided to first explore the Yellowknife Bay area, located in the opposite direction from Mount Sharp. Observations from Mars orbiters showed three different types of terrain coming together in Yellowknife Bay, plus a low elevation, all hints that water could have once flowed and pooled on the surface.

Q97. Which of the following is not necessarily correct in the context of the passage?
(a) On the basis of evidence found on Mars scientists have confirmed that ingredients for life once existed on Mars.
(b) NASA's rover Curiosity landed on Mars near Gale Crater.
(c) Drinkable water flowed through Yellowknife Bay once.
(d) Scientists are not sure if organic compounds existed on Mars.

Correct Answer: (c) Drinkable water flowed through Yellowknife Bay once.

Solution:
Step 1: Analyze each statement with reference to the passage.
- (a) The passage clearly states that scientists found *irrefutable evidence* that Mars once had the ingredients for life (minerals, sulphates, clays, etc.). Hence, (a) is correct.
- (b) The Curiosity rover indeed landed inside Gale Crater, located near the Martian equator. This is correct.
- (c) The passage says: "The water that once flowed through the area known as Yellowknife Bay was *likely drinkable*." The keyword is "likely," meaning it is not a certainty, only a probability. Thus, saying it *definitely* flowed as drinkable water is not necessarily correct.
- (d) The analysis "stopped short of a confirmation of organics," meaning scientists are not yet sure about organics. This is correct.
Step 2: Conclusion.
Since the certainty of (c) is doubtful ("likely" not "confirmed"), it is the one that is not necessarily correct.

$$\Rightarrow \boxed{(c) \text{ Drinkable water flowed through Yellowknife Bay once.}}$$

Quick Tip

When the passage uses cautious words like "likely," "may," or "suggests," avoid treating them as absolute facts in inference questions.

Q98. What do clays, sulphates and other minerals found near the rover's landing site suggest?
(a) They suggest that huge volcanic eruptions might have taken place in the remote past.

(b) They revealed that Mars once had favourable conditions for life.

(c) The evidence of clay suggests that once water flowed through the area.

(a) All (a), (b) and (c)
(b) Only (b)
(c) Only (c)
(d) Only (b) and (c)

Correct Answer: (d) Only (b) and (c)

Solution: The passage states that "analysis of clays, sulphates and other minerals shows they are all key to life" and that they are evidence of water flow in the past. This supports (b) and (c). No mention is made of volcanic eruptions.

$$\Rightarrow \boxed{\text{Only (b) and (c)}}$$

Quick Tip

Always cross-check if the option is explicitly mentioned in the passage. Avoid adding assumptions like "volcanic eruptions" when not stated.

Q99. Find the correct statement according to the passage.
(a) Though there is no evidence of organics at Yellowknife Bay site yet the possibility of life over there cannot be ruled out.
(b) There can be no life without carbon or organic compound.
(c) Even micro-organisms cannot exist in geological environment where there is complete lack of organics.
(d) The presence of water confirms the existence of life on Mars.

Correct Answer: (a) Though there is no evidence of organics at Yellowknife Bay site yet the possibility of life over there cannot be ruled out.

Solution: The passage says: "A lack of organics, however, would not rule out the Yellowknife Bay site as suitable for life." This exactly matches (a). (b) is incorrect, since scientists said carbon need not be present in a habitable geological environment. (c) contradicts the passage (chemoautotrophic microbes can survive on inorganic compounds). (d) is also false, since water only hints at conditions for life, not proof of life.

$$\Rightarrow \boxed{(a)}$$

Quick Tip

When options contain absolutes like "cannot be" or "confirms," they are usually traps in RC-based inference questions.

Q100. Which of the following conclusions can be drawn on the basis of facts mentioned in the given passage?
(a) Chemoautotrophic organisms with the help of carbon generate organic compounds.
(b) Life is not possible without carbon.
(c) Some of the micro-organisms on Earth can feed on inorganic compounds.
(d) Gale Crater contains not only hydrogen, oxygen and phosphorus but also carbon dioxide.

Correct Answer: Both (c) and (d)

Solution: From the passage: - It states: "Some micro-organisms on Earth, for example, can feed on inorganic compounds, such as what are found inside rocks." ⇒ supports (c). - It also states: "Analysis shows the Gale Crater rock contains carbon dioxide, in addition to hydrogen, oxygen, phosphorus, sulphur and nitrogen." ⇒ supports (d). Option (a) is incomplete since passage allows life even without carbon present. Option (b) is wrong for the same reason.

$$\Rightarrow \boxed{(c) \text{ and } (d)}$$

Quick Tip

Multiple correct facts may appear together in RC passages; ensure you check each option separately against the text.

Q101. What is the meaning of the word 'irrefutable' as used in the given passage?
(a) indefinite
(b) dubious
(c) questionable
(d) indisputable

Correct Answer: (d) indisputable

Solution: "Irrefutable evidence" means evidence that cannot be denied, disproved, or questioned. Thus, the closest synonym is "indisputable." Options (a), (b), (c) all convey uncertainty, which is the opposite of "irrefutable."

$$\Rightarrow \boxed{(d)}$$

Quick Tip

For vocabulary-in-context, always replace the word directly in the sentence and check which option fits without changing the meaning.

Q102. Choose the word opposite in meaning to the given word: PAUCITY

(a) Paragon
(b) Pronounce
(c) Plethora

Correct Answer: (c) Plethora

Solution: "Paucity" means scarcity, shortage, or lack of something. The opposite is "Plethora," which means excess, abundance, or over-supply. "Paragon" means model of excellence (not opposite). "Pronounce" is unrelated.

$$\Rightarrow \boxed{\text{Plethora}}$$

Quick Tip

For antonyms, always recall the root meaning of the word. "Paucity" (from Latin "paucus" = few) directly contrasts with "plethora" (from Greek "plethore" = fullness).

Q103. Choose the word opposite in meaning to the given word: HOSTILE
(a) Joyful
(b) Helpful
(c) Friendly
(d) Persuade
(e) Violent

Correct Answer: (c) Friendly

Solution:
"Hostile" means unfriendly, aggressive, or antagonistic.
The opposite is "Friendly," meaning kind, warm, or welcoming.
"Joyful" refers to happiness (not exact antonym). "Helpful" is positive but not directly opposite to "hostile." "Persuade" is an action verb, not opposite in meaning. "Violent" is actually a synonym, not an antonym.

$$\Rightarrow \boxed{\text{Friendly}}$$

Quick Tip

When finding antonyms, look for the direct opposite in emotional or relational tone. "Hostile" and "Friendly" are exact opposites.

Q104. Read each sentence to find out whether there is any grammatical or idiomatic error. (a) The car flew off the road
(b) and fell into the valley because

(c) Harish was driving faster
(d) No error

Correct Answer: (c) Harish was driving faster

Solution: The error lies in part (c). The phrase "Harish was driving faster" is incomplete because the comparative word "than" is missing. Faster always requires a comparison.
Correct usage: "Harish was driving faster *than he should have*" or "faster *than others*."

$$\Rightarrow \boxed{\text{Error in part (c)}}$$

Quick Tip

Comparative adjectives like "faster," "better," "smarter," should be followed by "than" to complete the comparison.

Q105. Read each sentence to find out whether there is any grammatical or idiomatic error. (a) You may choose
(b) any
(c) of the two subject
(d) No error

Correct Answer: (b) any

Solution: The error is in part (b). The word "any" is used when the choice is from more than two items. Since the choice is between two subjects, the correct word is "either."
Correct sentence: "You may choose *either of the two subjects*."

$$\Rightarrow \boxed{\text{Error in part (b)}}$$

Quick Tip

Use "either" for two choices and "any" when more than two options are available.

Q106. ___ is used to indicate possession.
(a) Hyphen
(b) Apostrophe
(c) Semi Colon
(d) Period

Correct Answer: (b) Apostrophe

Solution: An apostrophe (') is used to show possession, e.g., "Ravi's book," "the children's toys." Other marks like hyphen, semicolon, and period serve different purposes.

$$\Rightarrow \boxed{\text{Apostrophe}}$$

Quick Tip

Use apostrophe + s ('s) for singular possession, and s + apostrophe (s') for plural possession.

Q107. ___ is used to mark the end of declarative and imperative sentences.
(a) Semicolon
(b) Comma
(c) Dash
(d) Period

Correct Answer: (d) Period

Solution: A period (full stop) is used to mark the end of declarative (statements) and imperative sentences (commands/requests). E.g., "He is a doctor." / "Close the door."

$$\Rightarrow \boxed{\text{Period}}$$

Quick Tip

Remember: Period for statements, question mark for interrogatives, and exclamation mark for exclamations.

Q108. When a subordinate clause is followed by the main clause, ___ is required.
(a) Dash
(b) Semi-colon
(c) Comma
(d) Colon

Correct Answer: (c) Comma

Solution: When a subordinate clause comes before the main clause, a comma separates them. E.g., "Although it was raining, we went out."

$$\Rightarrow \boxed{\text{Comma}}$$

Quick Tip

If the subordinate clause follows the main clause, a comma is usually not needed.

Q109. Can you give me ___ details, please?
(a) faster
(b) further
(c) farther
(d) further

Correct Answer: (b) further

Solution: Here, the meaning is "additional details." The correct word is "further." "Farther" refers to physical distance, "faster" to speed. "Further" in this context means "more."

$$\Rightarrow \boxed{\text{further}}$$

Quick Tip

Use "farther" for distance, "further" for degree, time, or amount.

Q110. By the time he was eighteen years old, Peter ___ to make a living and support his family.
(a) begins
(b) began
(c) started beginning
(d) would begin

Correct Answer: (b) began

Solution: The sentence is in past tense ("By the time he was eighteen"). Hence the correct verb form is "began." "Begins" is present tense (wrong), "started beginning" is awkward and redundant, "would begin" implies future in the past, which is not intended here.

$$\Rightarrow \boxed{\text{began}}$$

Quick Tip

Match verb tense with the time marker in the sentence. "Was eighteen" (past) → "began" (past).

Q111. FLIMSY : STURDY
(a) prognosis : diagnosis
(b) gauche : eloquent
(c) flippant : earnest
(d) drizzle : downpour

Correct Answer: (c) flippant : earnest

Solution:
Step 1: Relationship in the given pair.
"Flimsy" means weak or fragile, while "sturdy" means strong or solid. They are *antonyms*.
Step 2: Check each option.
- (a) "Prognosis" (prediction of disease outcome) and "diagnosis" (identification of disease) are related terms, but not opposites.
- (b) "Gauche" (awkward, clumsy) and "eloquent" (fluent, expressive) are somewhat contrasting, but not perfect antonyms.
- (c) "Flippant" (casual, unserious) and "earnest" (serious, sincere) are exact opposites, just like flimsy vs. sturdy.
Step 3: Conclusion.
Option (c) best represents the antonym relationship.

$$\Rightarrow \boxed{(c)}$$

Quick Tip

In analogy questions, first decide the relation (synonym, antonym, degree, cause–effect) before comparing with the options.

Q112. GREGARIOUS : OUTGOING
(a) groggy : lucid
(b) grouchy : irritable
(c) aggressive : extrovert
(d) gritty : sociable

Correct Answer: (b) grouchy : irritable

Solution:
Step 1: Relationship in the given pair.
"Gregarious" and "outgoing" are synonyms — both mean sociable and friendly.
Step 2: Check each option.
- (a) "Groggy" (dazed, weak) and "lucid" (clear) are antonyms, not synonyms.
- (b) "Grouchy" (bad-tempered, irritable) and "irritable" are synonyms. This matches the given relationship.
- (c) "Aggressive" and "extrovert" are not synonyms — they describe different traits.
- (d) "Gritty" (courageous) and "sociable" are unrelated in meaning.
- (e) "Drizzle" and "downpour" are not synonyms; they differ in degree, not equality.
Step 3: Conclusion.
The synonym relationship in option (b) matches best.

$$\Rightarrow \boxed{(b)}$$

Quick Tip

For synonym analogies, confirm that both words share the same meaning field. "Gregarious = outgoing" is parallel to "grouchy = irritable."

Q113. Choose the option in which the usage of the word "for" is incorrect or inappropriate.
(a) He has a great eye for detail.
(b) We are waiting for the day.
(c) I can't bear for her to be angry.
(d) It couldn't be done for ever.

Correct Answer: (d) It couldn't be done for ever.

Solution:
Step 1: Examine each usage.
(a) "Eye for detail" – correct idiomatic usage.
(b) "Waiting for the day" – correct prepositional usage.
(c) "Bear for her to be angry" – acceptable usage in English.
(d) "For ever" is awkward; the standard expression is "forever" (one word). Hence this is inappropriate.

$$\Rightarrow \boxed{(d)}$$

Quick Tip

Some compound expressions like "forever," "into," or "upon" are written as single words in standard English, not as separate preposition + noun.

Q114. Choose the option in which the usage of the word "slam" is incorrect or inappropriate.
(a) I heard the door slam behind him.
(b) She slammed down the phone angrily.
(c) She slammed his face hard.
(d) The car skidded and slammed into a tree.

Correct Answer: (c) She slammed his face hard.

Solution:
Step 1: Examine each usage.
(a) "The door slam" – correct verb usage.
(b) "Slammed down the phone" – idiomatic and correct.
(c) "Slammed his face" – inappropriate, as "slam" is not normally used with a direct human

object like "face." The common usage is "slap" or "hit."
(d) "Slammed into a tree" – correct phrasal usage meaning "crash violently."
Step 2: Conclusion.
Option (c) is the incorrect/inappropriate usage.

$$\Rightarrow \boxed{(c)}$$

Quick Tip

"Slam" is generally used with doors, objects, or as "slam into" (collide). It is not idiomatically correct to say "slam a person's face."

Q115. The sentences (A–E) when properly sequenced form a coherent paragraph. Choose the most logical order.
(A) Similarly, turning to caste, even though being lower caste is undoubtedly a separate cause of disparity, its impact is all the greater when the lower-caste families also happen to be poor.
(B) Belonging to a privileged class can help a woman to overcome many barriers that obstruct women from less thriving classes.
(C) It is the interactive presence of these two kinds of deprivation—being low class and being female—that massively impoverishes women from the less privileged classes.
(D) A congruence of class deprivation and gender discrimination can blight the lives of poorer women very severely.
(E) Gender is certainly a contributor to societal inequality, but it does not act independently of class.
(a) EABDC
(b) EBDCA
(c) DAEBC
(d) BECDA

Correct Answer: (b) EBDCA

Solution:
Step 1: Opening idea.
(E) sets the thesis: gender contributes to inequality but interacts with class (not independent).
Step 2: Illustration via class.
(B) shows how class privilege mitigates barriers for women, linking gender with class.
Step 3: State the combined effect.
(D) generalizes the harm when class deprivation and gender discrimination coincide.
Step 4: Elaborate the interaction.
(C) restates the "interactive presence" explicitly (low class + female).
Step 5: Parallel case—caste with class.
(A) uses "Similarly" to extend the same logic to caste interacting with poverty.

$$\Rightarrow \boxed{\text{Order } E \to B \to D \to C \to A}$$

Quick Tip

Look for a thesis opener, examples/illustrations, then sentences with connectives like "Similarly" to extend the argument.

Q116. The sentences (A–E) when properly sequenced form a coherent paragraph. Choose the most logical order.
(A) This is now orthodoxy to which I subscribe—up to a point.
(B) It emerged from the mathematics of chance and statistics.
(C) Therefore the risk is measurable and manageable.
(D) The fundamental concept: Prices are not predictable, but the mathematical laws of chance can describe their fluctuations.
(E) This is how what business schools now call modern finance was born.
(a) ADCBE
(b) EBDCA
(c) ABDCE
(d) DCBEA

Correct Answer: (d) DCBEA

Solution:
Step 1: Core idea first.
(D) introduces the fundamental concept about price unpredictability but probabilistic description.
Step 2: Source of the idea.
(B) tells where this concept came from—math of chance and statistics.
Step 3: Consequence.
(C) infers that risk is measurable and manageable.
Step 4: Naming the field.
(E) concludes that this line of thought gave birth to modern finance.
Step 5: Author's stance.
(A) provides the author's reflective comment that this is now orthodoxy.

$$\Rightarrow \boxed{\text{Order } D \to B \to C \to E \to A}$$

Quick Tip

For paragraph ordering, place definitions/concepts before consequences, then origin/history, and end with evaluation or author's view.

DIRECTIONS (Q. 117 & 118): Select the most suitable synonym for the underlined word in the sentence.
Q117. The policy announcement was made to the much chagrin of the farmers.

(a) euphoria
(b) placation
(c) glee
(d) Mortification

Correct Answer: (d) Mortification

Solution:
Step 1: Meaning of the word.
"Chagrin" means distress, embarrassment, humiliation, or mortification at having failed or been disappointed.
Step 2: Match with options.
- (a) Euphoria → extreme happiness (opposite meaning).
- (b) Placation → soothing or calming (not the same).
- (c) Glee → joy, delight (again opposite).
- (d) Mortification → deep shame, embarrassment, humiliation → exact synonym.

$$\Rightarrow \boxed{\text{Mortification is the synonym of Chagrin.}}$$

Quick Tip

When solving synonym questions, always eliminate opposite meanings first, then pick the closest in tone.

Q118. The leader summoned the group and told that the time has come to act and not genuflect.
(a) grovel
(b) procrastinate
(c) renounce
(d) incriminate

Correct Answer: (a) grovel

Solution:
Step 1: Meaning of the word.
"Genuflect" literally means to bend the knee (especially in worship). Figuratively, it means to show excessive respect, deference, or servility.
Step 2: Match with options.
- (a) Grovel → behave in an excessively humble or servile way → exact synonym.
- (b) Procrastinate → delay action (different meaning).
- (c) Renounce → formally give up (different meaning).
- (d) Incriminate → to accuse of crime (not related).

$$\Rightarrow \boxed{\text{Grovel is the synonym of Genuflect.}}$$

Quick Tip

Remember: "Genuflect" has both a physical (kneel) and figurative (grovel) meaning—context helps decide.

Q119. Alleviate : Aggravate :: Elastic : _____
(a) Rigid
(b) Flexible
(c) Malleable
(d) Strong

Correct Answer: (a) Rigid

Solution:
Step 1: First pair analysis.
"Alleviate" means to lessen, while "Aggravate" means to worsen → they are opposites.
Step 2: Apply same relation.
"Elastic" means flexible/stretchable. Its opposite is "Rigid" (not flexible).
Step 3: Verify options.
- (a) Rigid → opposite of elastic → correct.
- (b) Flexible → synonym, not opposite.
- (c) Malleable → bendable, not opposite.
- (d) Strong → unrelated.

$$\Rightarrow \boxed{\text{Rigid is the correct answer.}}$$

Quick Tip

In analogy questions, first decide if the pair is synonym, antonym, cause-effect, etc., then apply same relation.

Q120. Benevolent : Kind :: Unclear : _____
(a) Bright
(b) Thick
(c) Luminous
(d) Muddy

Correct Answer: (d) Muddy

Solution:
Step 1: First pair analysis.
"Benevolent" is synonymous with "Kind."
Step 2: Apply same relation.
So "Unclear" should match with its synonym.

Step 3: Match options.
- (a) Bright → clear, opposite.
- (b) Thick → not exact synonym for unclear in this context.
- (c) Luminous → shining, opposite of unclear.
- (d) Muddy → not clear, obscure → correct synonym.

$$\Rightarrow \boxed{\text{Muddy is the correct synonym for Unclear.}}$$

Quick Tip

When spotting synonyms, eliminate words that are clear opposites first. Context makes synonym choice easier.

General Awareness

121. The Minister of Defence and National Security of Fiji, Ratu Inoke Kubuabola signed an MoU with the Minister of Defence, Finance and Corporate Affairs, Shri Arun Jaitley, recently. What is the capital of Fiji?
(a) Baku
(b) Suva
(c) Samona
(d) Paloha

Correct Answer: (b) Suva

Solution: Step 1: The question asks about the capital of Fiji. Fiji is an island nation in the South Pacific Ocean.
Step 2: Let us analyze the given options: - (a) **Baku** – This is the capital of Azerbaijan, not Fiji.
- (b) **Suva** – This is the capital city of Fiji, located on the southeast coast of the island of Viti Levu.
- (c) **Samona** – This appears to be a misspelling or confusion with "Samoa," which is a different island country, whose capital is Apia.
- (d) **Paloha** – This is not the capital of Fiji and is not recognized as any country's capital.
Step 3: Since Suva is the internationally recognized capital of Fiji, the correct answer is option (b).

$$\boxed{\text{Suva}}$$

Quick Tip

When solving capital city questions, first eliminate well-known incorrect options by recalling which country they belong to. This makes it easier to spot the correct choice quickly.

Q122. Which Indian sportsperson has been appointed as the WHO Goodwill Ambassador for physical activity in the South-East Asia Region (SEAR)?
(a) Mary Kom
(b) Milkha Singh
(c) Pullela Gopichand
(d) Abhinav Bindra

Correct Answer: (b) Milkha Singh

Solution:
Step 1: Understand the context.
The World Health Organization (WHO) appoints well-known personalities as Goodwill Ambassadors to promote public health awareness.
Step 2: Recall the fact.
Legendary Indian sprinter **Milkha Singh**, also known as the "Flying Sikh," was appointed as the WHO Goodwill Ambassador for physical activity in the South-East Asia Region (SEAR).
Step 3: Verify options.
- (a) Mary Kom → Famous Indian boxer, but not appointed in this role.
- (b) Milkha Singh → Correct; appointed as WHO Goodwill Ambassador (SEAR).
- (c) Pullela Gopichand → Badminton coach, not connected with this position.
- (d) Abhinav Bindra → Olympic gold medalist shooter, but not the appointee here.

$$\Rightarrow \boxed{\text{Milkha Singh is the correct answer.}}$$

Quick Tip

For current affairs questions, always connect the role/appointment with the personality's contribution in the same domain (sports, health, education, etc.).

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123. Asian Infrastructure Investment Bank (AIIB) has approved USD 150 million equity investment loan to the India Infrastructure Fund. It is the bank's first such loan to fund private projects. AIIB based in-?
(a) France
(b) Australia
(c) China
(d) Germany

Correct Answer: (c) China

Solution: Step 1: The Asian Infrastructure Investment Bank (AIIB) is a multilateral development bank that focuses on infrastructure development in Asia.
Step 2: AIIB's headquarters is located in **Beijing, China**.
Step 3: Therefore, the correct answer is option (c) China.

$$\boxed{\text{China}}$$

Quick Tip

AIIB was established in 2015 with China as its founding member and headquarters in Beijing. It funds infrastructure projects across Asia.

Q124. Which bank has started insolvency resolution process against Lanco Infratech Ltd. following a directive from the Reserve Bank of India (RBI), while this is the first resolution process initiated by the lenders against 12 large borrowers identified by the RBI recently?
(a) State Bank of India
(b) IDBI Bank
(c) Punjab National Bank
(d) Bank of India

Correct Answer: (b) IDBI Bank

Solution:
Step 1: Understand the context.
The Reserve Bank of India (RBI) identified 12 large corporate borrowers with high levels of non-performing assets (NPAs) for immediate insolvency resolution under the Insolvency and Bankruptcy Code (IBC).
Step 2: Focus on the case of Lanco Infratech Ltd.
Among these borrowers, Lanco Infratech Ltd. was one of the first companies against whom insolvency proceedings were initiated.
Step 3: Bank that initiated the process.
IDBI Bank was the lead lender that filed for insolvency proceedings against Lanco Infratech Ltd. as directed by the RBI.
Step 4: Eliminate incorrect options.
- (a) State Bank of India → Largest lender but not the initiator in this case.
- (b) IDBI Bank → Correct; started insolvency resolution process.
- (c) Punjab National Bank → Not the lead initiator.
- (d) Bank of India → Not involved in initiating this process.

$$\Rightarrow \boxed{\text{IDBI Bank is the correct answer.}}$$

Quick Tip

When answering current affairs questions related to banking and insolvency, always connect the institution (bank) with the company or directive mentioned by RBI/SEBI to avoid confusion.

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125. Which Indian student has been selected to represent India as young journalist at the global Football for Friendship (F4F) social programme?
(a) Satnam Bhamara
(b) Ananya Kamboj
(c) Shekhar Ramamurthy
(d) Samar Singh Sheikhawat

Correct Answer: (b) Ananya Kamboj

Solution: Step 1: The Football for Friendship (F4F) programme is a global social initiative organized by Gazprom and FIFA to promote youth involvement in football and journalism.
Step 2: From India, **Ananya Kamboj**, a young student from Chandigarh, was chosen to represent the country as a young journalist.
Step 3: She reported on the event as part of the international children's press centre.

Ananya Kamboj

Quick Tip

For sports-related current affairs, focus on international youth programmes like F4F, which often select students as ambassadors or reporters.

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126. The Bank of Bombay (15 April 1840) and the Bank of Madras (1 July 1843) followed the Bank of Bengal. These three banks remained at the apex of modern banking in India till their amalgamation as the Imperial Bank of India on 27 January — ?
(a) 1961
(b) 1956
(c) 1949
(d) 1921

Correct Answer: (d) 1921

Solution: Step 1: The three presidency banks in India were Bank of Bengal (1806), Bank of Bombay (1840), and Bank of Madras (1843).
Step 2: These banks were amalgamated into a single entity, the **Imperial Bank of India**, on 27 January 1921.

Step 3: Later, in 1955, the Imperial Bank of India was nationalized and renamed the **State Bank of India (SBI)**.

$$\boxed{1921}$$

Quick Tip

Remember: Presidency Banks (Bengal, Bombay, Madras) merged in 1921 → Imperial Bank of India → became State Bank of India in 1955.

Q127. Who has won the Baileys Women's Prize for Fiction 2015?
(a) Ali Smith
(b) Rachel Cusk
(c) Anne Tyler
(d) Sarah Waters

Correct Answer: (a) Ali Smith

Solution:
Step 1: About the prize.
The Baileys Women's Prize for Fiction is one of the most prestigious literary awards celebrating women writers across the world.
Step 2: Year 2015 award.
In 2015, the award was conferred on **Ali Smith**, the Scottish author, for her novel *How to Be Both*.
Step 3: Elimination of other options.
- (b) Rachel Cusk → A renowned novelist but not the 2015 winner.
- (c) Anne Tyler → Won the Pulitzer Prize for Fiction, but not the Baileys Prize 2015.
- (d) Sarah Waters → Another celebrated author, but not the winner of that year.

$$\Rightarrow \boxed{\text{Ali Smith is the winner of Baileys Prize 2015.}}$$

Quick Tip

When dealing with awards-based questions, always link the award with the specific year and the winning book to avoid confusion.

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128. The highest multipurpose dam built on the river Ravi is — ?
(a) Bhakra Nangal
(b) Kahalgaon
(c) Ranjit Sagar Dam
(d) Rihand Dam

Correct Answer: (c) Ranjit Sagar Dam

Solution:
Step 1: The Ranjit Sagar Dam, also known as the Thein Dam, is built on the Ravi river in Punjab-Jammu & Kashmir border.

Step 2: It is the highest earth-fill multipurpose dam in India constructed on the Ravi river.

Step 3: Bhakra Nangal is on the Sutlej river, Rihand dam is on the Rihand river, and Kahalgaon is a thermal power station in Bihar, not a dam.

$$\boxed{\text{Ranjit Sagar Dam}}$$

Quick Tip

Link rivers with major dams: Ravi → Ranjit Sagar; Sutlej → Bhakra Nangal; Rihand → Rihand Dam.

Q129. The District Primary Education Programme in India is supported by:
(a) International Monetary Fund
(b) World Bank
(c) UNESCO
(d) Japanese Government

Correct Answer: (c) UNESCO

Solution:
Step 1: About DPEP.
The District Primary Education Programme (DPEP) was launched in 1994 in India to universalize primary education and improve the quality of learning in schools.
Step 2: International support.
Although the programme received financial assistance from agencies like the World Bank, DFID (UK), and UNICEF, the technical support and global educational expertise came primarily through **UNESCO**, which played a central role in capacity building, training modules, and monitoring educational standards.
Step 3: Elimination of wrong options.
- (a) IMF → Deals mainly with monetary and financial stability, not education.
- (b) World Bank → Provided financial help, but UNESCO's support was the central technical backing.
- (d) Japanese Government → Extended help in other infrastructure projects, not DPEP.

$$\Rightarrow \boxed{\text{The District Primary Education Programme is supported by UNESCO.}}$$

Quick Tip

Education-related programmes are often supported by UNESCO, while financial assistance may come from World Bank or IMF. Always distinguish between financial and technical support in such questions.

Q130. Which of the following Mahatma Gandhi series of currency notes issued by RBI has "ecology" depicted on it?
(a) 500
(b) 100
(c) 50
(d) 5

Correct Answer: (d) 5

Solution:
Step 1: About Mahatma Gandhi Series.
The Mahatma Gandhi series of currency notes was first introduced in 1996 by the Reserve Bank of India (RBI). Each denomination carried a different theme or design representing India's cultural and heritage aspects.
Step 2: Identifying the note with ecology.
Among these notes, the **5 rupee note** depicted the theme of **"Ecology"**, with illustrations of agricultural and natural elements (such as trees, farming, and environment-related symbols).
Step 3: Elimination of other options.
- (a) 500 → Depicts Red Fort.
- (b) 100 → Shows Himalayas.
- (c) 50 → Shows Indian Parliament.
- (d) 5 → Correct, as it depicts ecology and environmental balance.

$$\Rightarrow \boxed{\text{The 5 rupee note in the Mahatma Gandhi series has ecology depicted on it.}}$$

Quick Tip

Always remember: In the Mahatma Gandhi currency series, each denomination had a distinct theme. Ecology was shown on the 5 rupee note, heritage sites like Red Fort on the 500 note, and the Himalayas on the 100 note.

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131. Which country is providing technology to develop the coastal road project in Maharashtra?
(a) Netherlands
(b) Japan
(c) China

(d) Australia

Correct Answer: (a) Netherlands

Solution: Step 1: The Mumbai Coastal Road Project is one of the biggest infrastructure projects in Maharashtra, designed to reduce traffic congestion.
Step 2: The project involves advanced coastal engineering, especially reclamation, dykes, and storm surge protection.
Step 3: The Netherlands, known for its world-class expertise in water management and coastal engineering, has been providing technological support for the project.

Netherlands

Quick Tip

Whenever coastal or flood-control technology is mentioned, think of the Netherlands — a global leader in coastal engineering and water management.

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132. The first BRICS film festival has begun in which of the following cities in India?
(a) New Delhi
(b) Bhopal
(c) Jaipur
(d) Goa

Correct Answer: (a) New Delhi

Solution: Step 1: The BRICS Film Festival was launched as part of cultural exchange among BRICS nations (Brazil, Russia, India, China, South Africa).
Step 2: The first edition of the festival was held in **New Delhi** in September 2016.
Step 3: It showcased films from all BRICS countries, strengthening cultural diplomacy.

New Delhi

Quick Tip

For BRICS-related cultural or diplomatic firsts in India, New Delhi is usually the venue as it is the capital and hub of international events.

Q133. Which of the following state governments has signed a memorandum of understanding (MoU) with the Ministry of Civil Aviation to develop 11 airports and airstrips to boost regional connectivity recently?

(a) Kerala
(b) Gujarat
(c) Rajasthan
(d) Madhya Pradesh

Correct Answer: (b) Gujarat

Solution:

Step 1: Context of the MoU.
The Government of India, through the Ministry of Civil Aviation, has been working on the **UDAN (Ude Desh ka Aam Nagrik)** scheme to enhance regional air connectivity by developing small airports and airstrips.
Step 2: Specific MoU signed.
As part of this initiative, the **Gujarat State Government** signed a Memorandum of Understanding (MoU) with the Ministry of Civil Aviation to develop and modernize **11 airports and airstrips** in the state.

Step 3: Elimination of options.
- (a) Kerala → Not the state that signed this MoU.
- (b) Gujarat → Correct, signed for 11 airports/airstrips.
- (c) Rajasthan → Signed MoUs under UDAN but not for 11 airports in this case.
- (d) Madhya Pradesh → Has regional air development plans but not this MoU.

$$\Rightarrow \boxed{\text{Gujarat is the correct state that signed the MoU.}}$$

Quick Tip

Link this with the **UDAN scheme**, as most state-MoUs for airport development are connected to boosting regional connectivity under UDAN. Gujarat signed for 11 airports, making it a key state in this initiative.

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134. Who is the newly elected President of Mongolia?
(a) Sainkhuugiin Ganbaatar
(b) Miyeegombyn Enkhbold
(c) Tsakhiagiin Elbegdorj
(d) Khaltmaagiin Battulga

Correct Answer: (d) Khaltmaagiin Battulga

Solution:
Step 1: In the 2017 Mongolian presidential elections, businessman and former judo champion **Khaltmaagiin Battulga** won the presidency.

Step 2: Other candidates included Sainkhuugiin Ganbaatar and Miyeegombyn Enkhbold, but they lost in the run-off.

Step 3: Tsakhiagiin Elbegdorj was the outgoing President who completed his term before Battulga took office.

Khaltmaagiin Battulga

Quick Tip

Battulga is known as a former judo champion turned politician — making him an easy figure to remember as Mongolia's President in 2017.

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135. Name the agency, which is an agency to provide 'soft loans' to developing countries.
(a) Asian Infrastructure Investment Bank (AIIB)
(b) Organization of the Petroleum Exporting Countries (OPEC)
(c) Asian Development Bank (ADB)
(d) International Development Association (IDA)

Correct Answer: (d) International Development Association (IDA)

Solution:
Step 1: The International Development Association (IDA) is part of the World Bank Group.

Step 2: IDA provides interest-free or concessional loans (called **soft loans**) and grants to the world's poorest countries to support development projects.

Step 3: Other agencies mentioned:
- AIIB and ADB provide infrastructure loans, often at commercial rates.
- OPEC focuses on petroleum policies, not soft loans.

International Development Association (IDA)

Quick Tip

"Soft loans" = concessional/interest-free loans → always link with **IDA**, a wing of the World Bank.

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136. Which one of the following does not appear on the abacus of the Sarnath Lion capital of Ashoka?

(a) Bull
(b) Deer
(c) Elephant
(d) Horse

Correct Answer: (b) Deer

Solution:
Step 1: The Lion Capital of Ashoka at Sarnath is India's national emblem.

Step 2: On its abacus (circular base), four animals are carved:
- **Lion**, symbolizing power and courage.
- **Bull**, symbolizing hard work and steadfastness.
- **Horse**, symbolizing loyalty and energy.
- **Elephant**, symbolizing strength and wisdom.

Step 3: The **Deer** does not appear on the abacus. The deer instead appears at Sarnath in Buddhist context (Dharmachakra Pravartana scene), but not on the Ashokan Lion Capital.

$$\boxed{\text{Deer}}$$

Quick Tip

On the Sarnath Lion Capital abacus: Elephant, Bull, Horse, and Lion appear. **Deer** is absent — but often confused due to Sarnath's Buddhist symbolism.

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137. Which authority recommends the principles governing the grants-in-aid of the revenues of the states out of the Consolidated Fund of India?
(a) Public Accounts Committee
(b) Union Ministry of Finance
(c) Finance Commission
(d) Inter State Council

Correct Answer: (c) Finance Commission

Solution:
Step 1: Article 280 of the Indian Constitution provides for the Finance Commission.

Step 2: The Finance Commission recommends how the Union government should distribute tax revenues between the Centre and the States.

Step 3: It also lays down the principles governing **grants-in-aid** from the Consolidated Fund of India to the states in need of financial assistance.

Finance Commission

Quick Tip

Remember: Finance Commission = Article 280 = Revenue sharing + Grants-in-aid recommendations.

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138. Which city hosted the 2017 World Food India (WFI)?
(a) Kochi
(b) New Delhi
(c) Chandigarh
(d) Surat

Correct Answer: (b) New Delhi

Solution:
Step 1: World Food India (WFI) 2017 was the first international mega food event organized by the Ministry of Food Processing Industries.

Step 2: It took place in **New Delhi** in November 2017, attracting global investors and participants.

New Delhi

Quick Tip

Most major international summits, expos, and first-time events in India are hosted in New Delhi.

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139. The tax which the kings used to collect from the people in the Vedic period was called — ?
(a) Bali
(b) Vidatha
(c) Varman
(d) Kara

Correct Answer: (a) Bali

Solution:
Step 1: In the Vedic period, various forms of contributions were made to the king and religious

institutions.

Step 2: Bali was the tax collected from the people, usually in the form of a portion of agricultural produce.

Step 3: Other terms:
- Vidatha: social and religious assembly.
- Varman: a title or suffix, not a tax.
- Kara: a general term for tax in later periods.

Bali

Quick Tip

Link: Vedic tax = **Bali**. Later medieval tax = **Kara**.

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140. Which of the following cities won the right to host the 2020 edition of the Olympic Games?
(a) St Petersburg
(b) Tokyo
(c) Madrid
(d) Istanbul

Correct Answer: (b) Tokyo

Solution:
Step 1: The International Olympic Committee (IOC) selected the host city for the 2020 Summer Olympics in 2013.

Step 2: Tokyo, Japan was chosen as the host city, defeating Madrid and Istanbul in the final voting rounds.

Tokyo

Quick Tip

Olympics trivia: Tokyo hosted in 1964 and again in 2020 (postponed to 2021 due to COVID-19).

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141. World's first Bank-Agnostic Instant Funds Transfer Platform using Facebook was launched by — ?

(a) ICICI Bank
(b) Kotak Mahindra Bank
(c) IndusInd Bank
(d) Central Bank

Correct Answer: (b) Kotak Mahindra Bank

Solution:
Step 1: Kotak Mahindra Bank launched **"KayPay"**, the world's first bank-agnostic instant funds transfer platform using Facebook.

Step 2: It allowed users to transfer money securely to friends on Facebook regardless of their bank.

Kotak Mahindra Bank

Quick Tip

Remember: KayPay = Kotak + Facebook instant transfer (bank-agnostic).

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142. Open market operations, one of the measures taken by RBI in order to control credit expansion in the economy means — ?
(a) Sale or purchase of Govt. securities
(b) Issuance of different types of bonds
(c) Auction of gold
(d) None of the above

Correct Answer: (a) Sale or purchase of Govt. securities

Solution:
Step 1: Open Market Operations (OMO) are a monetary policy tool of the Reserve Bank of India.

Step 2: OMOs involve the **sale or purchase of government securities** in the open market by the RBI to regulate liquidity in the economy.

Step 3: Sale of securities = reduces liquidity; Purchase of securities = injects liquidity.

Sale or purchase of Govt. securities

Quick Tip

OMO = Liquidity control mechanism by RBI. Sell securities → absorb money; Buy securities → release money.

143. Which city is hosting the 12th edition of G-20 Summit 2017?
(a) Hamburg
(b) Berlin
(c) Frankfurt
(d) Stuttgart

Correct Answer: (a) Hamburg

Solution:
Step 1: The G-20 Summit is an annual meeting of leaders from the world's 20 major economies.

Step 2: The 12th edition of the summit was held in **Hamburg, Germany**, in July 2017.

Step 3: It focused on global trade, climate change, and international cooperation.

Hamburg

Quick Tip

For G-20 Summits, always remember the 2017 venue: Hamburg, Germany.

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144. The 'Seven Pagodas' of Mahabalipuram are a witness to the art patronized by the — ?
(a) Pallavas
(b) Pandyas
(c) Cholas
(d) Cheras

Correct Answer: (a) Pallavas

Solution:
Step 1: Mahabalipuram (Mamallapuram) is famous for its rock-cut architecture and shore temples.

Step 2: These were built during the reign of the **Pallava dynasty**, especially under Narasimhavarman I and Rajasimha.

Step 3: The "Seven Pagodas" refers to a group of temples on the shore, of which only the Shore Temple survives prominently.

Pallavas

Quick Tip

Mahabalipuram temples = Pallavas (7th–8th century). Always connect them with shore temples and rock-cut architecture.

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145. The Phillips curve is the schedule showing the relationship between — ?
(a) Aggregate supply and demand
(b) Total saving and investment
(c) The rate of unemployment and rate of inflation
(d) Demand for and supply of loanable funds

Correct Answer: (c) The rate of unemployment and rate of inflation

Solution:
Step 1: The Phillips Curve is an economic concept introduced by A.W. Phillips.

Step 2: It illustrates an **inverse relationship** between the rate of unemployment and the rate of inflation in an economy.

Step 3: Lower unemployment often comes with higher inflation, and higher unemployment tends to reduce inflation.

Unemployment vs. Inflation

Quick Tip

Phillips Curve = Inverse relation between inflation and unemployment.

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146. Mantle of the earth crust is — ?
(a) A layer with the composition of semi-solid mineral matter
(b) A layer with the composition of fluid mineral matter
(c) A layer with the composition of semi-fluid mineral matter
(d) A layer with the composition of gaseous mineral matter

Correct Answer: (c) A layer with the composition of semi-fluid mineral matter

Solution:
Step 1: The Earth's structure is divided into crust, mantle, and core.

Step 2: The **mantle** lies below the crust and extends up to 2,900 km deep.

Step 3: It consists of semi-fluid silicate minerals, enabling tectonic plate movement (asthenosphere).

Semi-fluid mineral matter

Quick Tip

Crust = solid, Mantle = semi-fluid, Outer core = liquid, Inner core = solid.

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147. "Dulari Kanya" scheme has been launched by which state government to check infant mortality?
(a) Arunachal Pradesh
(b) Himachal Pradesh
(c) Madhya Pradesh
(d) Andhra Pradesh

Correct Answer: (a) Arunachal Pradesh

Solution:
Step 1: The "Dulari Kanya" scheme was launched by the **Arunachal Pradesh** government.

Step 2: Under the scheme, every girl child born in government hospitals is given a fixed deposit certificate of 20,000, to be redeemed on attaining adulthood.

Step 3: The scheme aims to encourage institutional deliveries and reduce infant mortality.

Arunachal Pradesh

Quick Tip

Link "Dulari Kanya" = Arunachal Pradesh (focus on girl child welfare + infant mortality reduction).

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148. Which of the following companies inked pact with Microsoft India to offer telecom and IT solutions for big businesses promoting the demand for IT and cloud services?
(a) BHEL
(b) ONGC
(c) IRCTC
(d) BSNL

Correct Answer: (d) BSNL

Solution:
Step 1: BSNL (Bharat Sanchar Nigam Limited) partnered with Microsoft India.

Step 2: The collaboration was to deliver telecom and IT solutions, particularly cloud-based services, to large enterprises.

$$\boxed{\text{BSNL}}$$

Quick Tip

BSNL + Microsoft → Cloud + Enterprise IT services partnership.

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149. Who wrote the line: "A thing of beauty is a joy forever"?
(a) John Keats
(b) Robert Browning
(c) P.B. Shelley
(d) William Wordsworth

Correct Answer: (a) John Keats

Solution:
Step 1: The famous line **"A thing of beauty is a joy forever"** is from John Keats' poem *Endymion*.

Step 2: It reflects Keats' romantic philosophy that beauty transcends time.

$$\boxed{\text{John Keats}}$$

Quick Tip

Romantic poetry + beauty theme = John Keats. "A thing of beauty is a joy forever" = Endymion.

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150. The Tadoba Andhari Tiger Reserve (TATR) is located in which state?
(a) Tamil Nadu
(b) Karnataka
(c) Maharashtra
(d) Goa

Correct Answer: (c) Maharashtra

Solution:
Step 1: The Tadoba Andhari Tiger Reserve (TATR) is the oldest and largest national park in Maharashtra.

Step 2: It is located in Chandrapur district and is a Project Tiger reserve.

Step 3: It is famous for its high tiger population and rich biodiversity.

$$\boxed{\text{Maharashtra}}$$

Quick Tip

Tadoba Andhari = Maharashtra's most famous tiger reserve (Chandrapur district).
