CUET-UG General Aptitude Test Sample Paper-20

Duration: 1 Hour **Maximum Marks: 250**

Instructions

- This paper contains a total of 50 Multiple Choice Questions.
- Each correct answer carries **+5 marks**.
- Each incorrect answer carries **-1 mark**.
- No negative marking for unattempted questions.

Q1. A shopkeeper marks his goods 40% above the cost price and allows a discount of 25% on the marked price. His profit or loss percentage is:

(A) 5% profit

(B) 10% profit

(C) 5% loss

(D) 10% loss

Q2. If A : B = 3 : 4 and B : C = 8 : 9, then A : C is:

(A) 1:2

(B) 3:2

(C) 2:3

(D) 1:3

Q3. A sum of money amounts to ₹ 6,655 in 3 years at 10% compound interest per annum, compounded annually. The principal sum is:

(A) ₹ 5,000

(B) ₹ 5,500

(C) ₹ 6,000

(D) ₹ 4,500

Q4. A and B can complete a piece of work in 12 days and 18 days respectively. They work together for 4 days, and then A leaves. How long will B take to finish the remaining work?

(A) 6 days

(B) 8 days

(C) 10 days

(D) 12 days

Q5. A train 150 meters long crosses a platform 250 meters long in 20 seconds. The speed of the train is:

(A) 54 km/hr

(B) 72 km/hr

(C) 80 km/hr

(D) 90 km/hr

Q6. The price of sugar increases by 20%. By what percentage must a housewife reduce the consumption of sugar so that the expenditure on it remains the same?

(A) 16 2/3%

(B) 20%

(C) 25%

(D) 15%

Q7. A sum of ₹ 1,200 is divided among P, Q, and R in the ratio 2:3:5. What is the difference between the shares of P and R?

(A) ₹ 360

(B) ₹ 400

(C) ₹ 240

(D) ₹ 120

Q8. If 15% of (A + B) = 25% of (A – B), then what percent of B is equal to A?

(A) 100%

(B) 400%

(C) 200%

(D) 250%

Q9. A man can row 6 km/h in still water. If the speed of the current is 2 km/h, it takes him 3 hours to row to a place and come back. How far is the place?

(A) 6 km

(B) 8 km

(C) 10 km

(D) 12 km

Q10. By selling an article for ₹ 960, a man incurs a loss of 4%. At what price should he sell it to gain 10%?

(A) ₹ 1,100

(B) ₹ 1,050

(C) ₹ 1,000

(D) ₹ 1,200

Q11. A person travels from P to Q at a speed of 40 km/h and returns by increasing his speed by 50%. What is his average speed for the entire journey?

(A) 45 km/h

(B) 48 km/h

(C) 50 km/h

(D) 52 km/h

Q12. If 10 men can do a job in 20 days, then 20 men with twice the efficiency can do the same job in:

(A) 5 days

(B) 10 days

(C) 2.5 days

(D) 15 days

Q13. Find the smallest number which when divided by 12, 15, and 18 leaves a remainder of 7 in each case.

(A) 180

(B) 187

(C) 173

(D) 194

Q14. If the number 4832_18 is divisible by 11, then the missing digit (_) is:

(A) 2

(B) 3

(C) 5

(D) 9

Q15. The value of $\sqrt{12 + \sqrt{12 + \sqrt{12 + \ldots}}}$ to infinity is:

(A) 3

(B) 4

(C) 6

(D) 12

Q16. Which of the following fractions is the largest?

(A) 5/8

(B) 7/11

(C) 9/14

(D) 3/5

Q17. Simplify: $(256)^{0.16} \times (256)^{0.09}$

(A) 4

(B) 16

(C) 64

(D) 256.25

Q18. If $x + \frac{1}{x} = 5$, then the value of $x^2 + \frac{1}{x^2}$ is:

(A) 25

(B) 23

(C) 27

(D) 20

Q19. The sum of the internal angles of a regular polygon is 1080°. How many sides does the polygon have?

(A) 6

(B) 7

(C) 8

(D) 10

Q20. A ladder 15m long just reaches the top of a vertical wall. If the ladder makes an angle of 60° with the wall, find the height of the wall.

(A) 7.5 m

(B) $7.5\sqrt{3}$ m

(C) 15 m

(D) $15\sqrt{3}$ m

Q21. In a circle, a chord of length 16 cm is at a distance of 6 cm from the center. The radius of the circle is:

(A) 8 cm

(B) 10 cm

(C) 12 cm

(D) 14 cm

Q22. If the radius of a cylinder is doubled and the height is halved, the ratio of the new volume to the original volume is:

(A) 1:1

(B) 1:2

(C) 2:1

(D) 4:1

Q23. The area of a semi-circle is 77 sq. cm. Its perimeter is:

(A) 36 cm

(B) 44 cm

(C) 58 cm

(D) 72 cm

Q24. The surface area of a sphere is 616 sq. cm. Its volume is approximately:

(A) 1437.33 cm^3

(B) 1347.33 cm^3

(C) 1237.33 cm^3

(D) 1537.33 cm^3

Q25. In a certain code, 'ORANGE' is written as 'PSBOHF'. How is 'APPLE' written in that code?

(A) BQQMF

(B) BRQMF

(C) BQQNF

(D) BPPLF

Q26. Pointing to a photograph, a man said, "I have no brother or sister but that man's father is my father's son." Whose photograph was it?

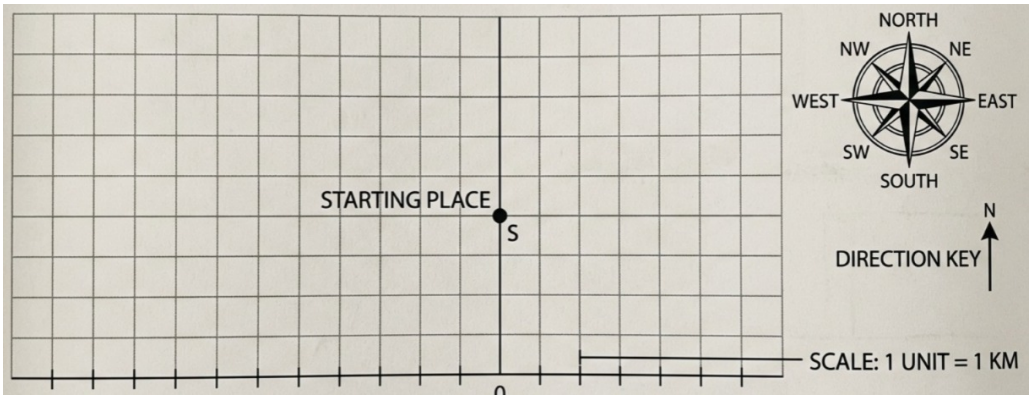
(A) His son's

(B) His father's

(C) His own

(D) His nephew's

Q27. A man walks 5 km towards South and then turns to the right. After walking 3 km he turns to the left and walks 5 km. Now in which direction is he from the starting place?



(A) West

(B) South

(C) North-East

(D) South-West

Q28. Complete the series: 7, 10, 16, 28, 52, ?

(A) 88

(B) 96

(C) 100

(D) 104

Q29. If '+' means '×', '-' means '÷', '×' means '-' and '÷' means '+', then what is the value of: $20 + 8 - 4 \div 2$?

(A) 40

(B) 42

(C) 38

(D) 44

Q30. In a row of students, Anil is 7th from the left and Rohit is 9th from the right. If they interchange their positions, Anil becomes 11th from the left. How many students are there in the row?

(A) 19

(B) 20

(C) 21

(D) 18

Q31. Statements: (I) All singers are dancers. (II) Some dancers are actors.
Conclusions: (I) Some singers are actors. (II) Some actors are dancers.

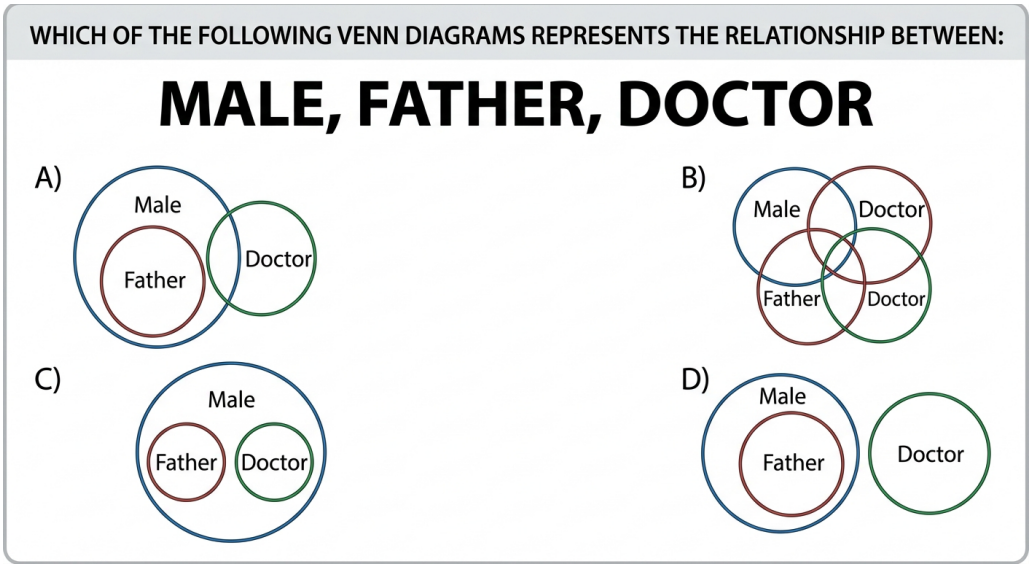
(A) Only I follows

(B) Only II follows

(C) Both I and II follow

(D) Neither I nor II follows

Q32. Which of the following Venn diagrams represents the relationship between: Male, Father, Doctor?



(A) One circle inside another, and a third overlapping both.

(B) Three mutually overlapping circles.

(C) Two separate circles inside a larger circle.

(D) One circle inside another, and a third separate circle.

Q33. Six people A, B, C, D, E, and F are sitting in a circle facing the center. B is between F and C; A is between E and D; F is to the left of D. Who is between A and F?

(A) E

(B) D

(C) C

(D) B

Q34. In a class of 45 students, Rank of Ayush is 15th from top. What is his rank from the bottom?

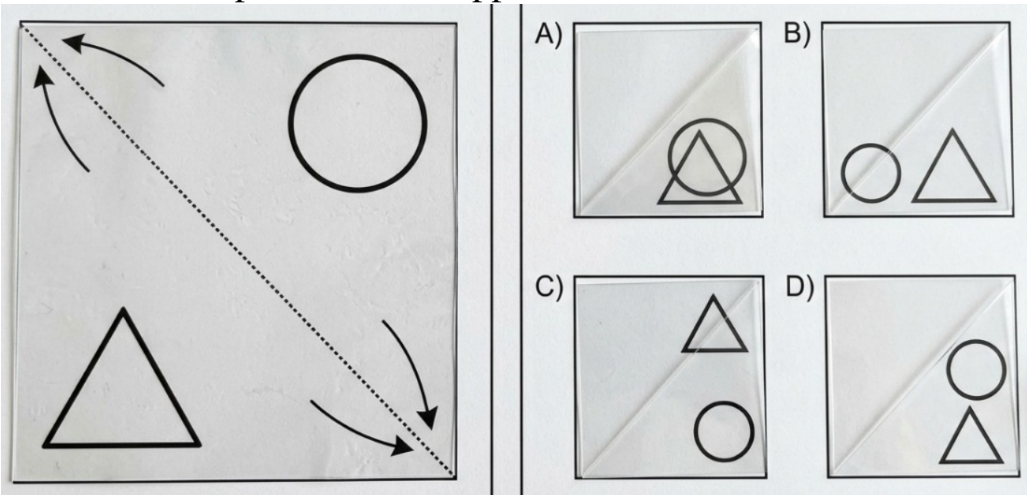
(A) 30th

(B) 31st

(C) 29th

(D) 32nd

Q35. A square transparent sheet with a pattern is folded along the dotted line as shown in the problem figure. Choose the correct option from the answer figures that shows how the pattern would appear after the fold.



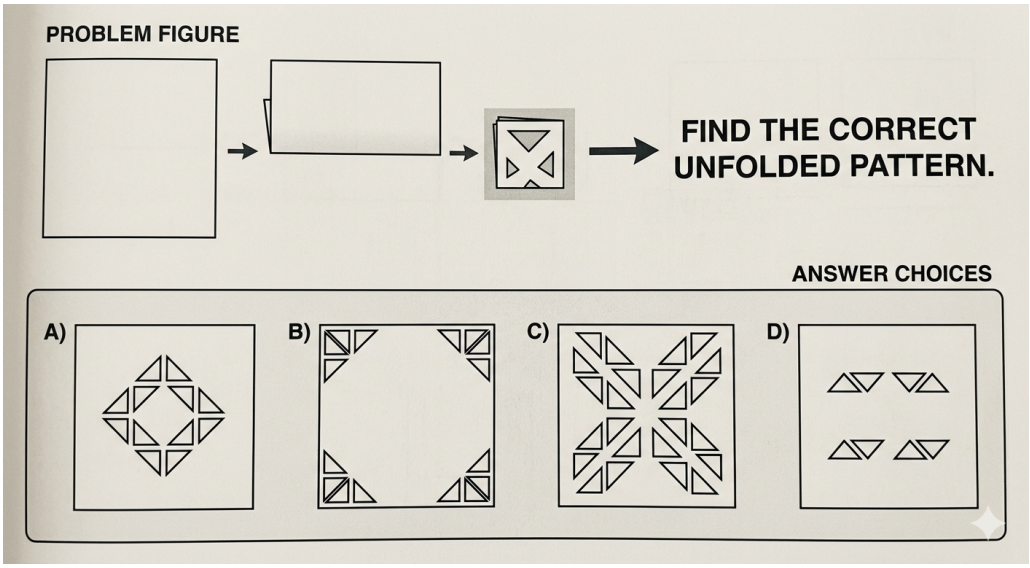
(A) The circle and triangle overlap in the center.

(B) The circle moves to the bottom-left, appearing inside or over the triangle.

(C) The triangle moves to the top-right, appearing away from the circle.

(D) The sheet appears blank on one side of the diagonal with both shapes merged on the other.

Q36. Find the correct unfolded pattern for the following folded square paper which has been punched with three distinct triangular holes.



(A) A pattern of 12 triangles forming a diamond shape in the center of the paper.

(B) A pattern of 8 triangles located only at the corners of the paper.

(C) A pattern of 12 triangles arranged in four diagonal lines radiating from the center.

(D) A pattern of 6 triangles forming two parallel lines across the paper.

Q37. Who was awarded the Nobel Peace Prize 2023?

(A) Narges Mohammadi

(B) Maria Ressa

(C) Ales Bialiatski

(D) Denis Mukwege

Q38. Which country hosted the G20 Summit in 2023?

(A) Indonesia

(B) India

(C) Brazil

(D) South Africa

Q39. Who is the current Chairperson of the ISRO (as of early 2024)?

(A) S. Somanath

(B) K. Sivan

(C) A.S. Kiran Kumar

(D) G. Madhavan Nair

Q40. Which team won the ICC Men's Cricket World Cup 2023?

(A) India

(B) Australia

(C) South Africa

(D) New Zealand

Q41. The 2024 Summer Olympics will be held in which city?

(A) Tokyo

(B) Paris

(C) Los Angeles

(D) Brisbane

Q42. Which Article of the Indian Constitution deals with the 'Abolition of Untouchability'?

(A) Article 14

(B) Article 17

(C) Article 19

(D) Article 21

Q43. Who was the Governor-General of India during the Revolt of 1857?

(A) Lord Dalhousie

(B) Lord Canning

(C) Lord Bentinck

(D) Lord Lytton

Q44. Which river is known as the 'Sorrow of Bihar'?

(A) Gandak

(B) Kosi

(C) Son

(D) Damodar

Q45. In which year did the Dandi March take place?

(A) 1920

(B) 1930

(C) 1942

(D) 1919

Q46. Scurvy is caused by the deficiency of which vitamin?

(A) Vitamin A

(B) Vitamin B

(C) Vitamin C

(D) Vitamin D

Q47. What is the SI unit of Pressure?

(A) Joule

(B) Newton

(C) Pascal

(D) Watt

Q48. What is the chemical name of Baking Soda?

(A) Sodium Carbonate

(B) Sodium Bicarbonate

(C) Calcium Carbonate

(D) Sodium Chloride

Q49. The 'Paris Agreement' is primarily related to:

(A) Nuclear Disarmament

(B) International Trade

(C) Climate Change

(D) Human Rights

Q50. Which layer of the atmosphere contains the Ozone layer?

(A) Troposphere

(B) Stratosphere

(C) Mesosphere

(D) Exosphere

Detailed Solutions

Q1.

Solution

Concept: The net profit or loss percentage results from the combination of a markup and a discount. If the final Selling Price (SP) is higher than the Cost Price (CP), it is a profit; if lower, it is a loss. This can be solved by assuming a base value or using the successive percentage formula: $a + b + \frac{ab}{100}$.

Solution: Let the Cost Price (CP) be 100.

- Marked Price (MP) = $100 \times (1 + 0.40) = 140$.
- Selling Price (SP) after 25% discount = $140 \times (1 - 0.25) = 140 \times 0.75 = 105$.
- Profit = $SP - CP = 105 - 100 = 5$.
- Profit percentage = $\frac{5}{100} \times 100 = 5\%$.

Final Answer: The shopkeeper makes a 5% profit.

Answer: (A)

Q2.

Solution

Concept: To find the ratio between two non-adjacent terms (like A and C), we combine the ratios by normalizing the shared term (B). Alternatively, this can be solved by multiplying the fractions: $\frac{A}{C} = \frac{A}{B} \times \frac{B}{C}$.

Solution: Given $A : B = 3 : 4$ and $B : C = 8 : 9$. Expressing these as fractions:

$$\frac{A}{B} = \frac{3}{4} \quad \text{and} \quad \frac{B}{C} = \frac{8}{9}$$

To find $\frac{A}{C}$, we multiply the two ratios:

$$\frac{A}{C} = \frac{A}{B} \times \frac{B}{C} = \frac{3}{4} \times \frac{8}{9}$$

Simplifying the expression:

$$\frac{A}{C} = \frac{3 \times 8}{4 \times 9} = \frac{24}{36}$$

Reducing to the simplest form by dividing by 12:

$$\frac{A}{C} = \frac{2}{3} \implies A : C = 2 : 3$$

Final Answer: The ratio $A : C$ is 2 : 3.

Answer: (C)

Q3.

Solution

Concept: The Amount (A) in compound interest is calculated using the formula $A = P(1 + r)^n$, where P is the principal, r is the interest rate as a decimal, and n is the number of years. For a 10% rate, the multiplier is 1.1.

Solution: Given: Amount (A) = 6,655, Rate (R) = 10%, Time (n) = 3 years. Using the formula:

$$A = P\left(1 + \frac{R}{100}\right)^n$$

Substituting the given values:

$$6655 = P\left(1 + \frac{10}{100}\right)^3$$

$$6655 = P\left(\frac{11}{10}\right)^3$$

$$6655 = P\left(\frac{1331}{1000}\right)$$

Solving for P:

$$P = \frac{6655 \times 1000}{1331}$$

Since $1331 \times 5 = 6655$:

$$P = 5 \times 1000 = 5000$$

Final Answer: The principal sum is 5,000.

Answer: (A)

Q4.

Solution

Concept: The "Total Work" method uses the Least Common Multiple (LCM) of the given days to represent work as units. This allows us to determine the daily efficiency (units/day) of each individual and calculate the remaining work after one person leaves.

Solution: Let the total work be the LCM of 12 and 18, which is 36 units.

- Efficiency of A = $\frac{36}{12}$ = 3 units/day.
- Efficiency of B = $\frac{36}{18}$ = 2 units/day.
- Combined efficiency of A and B = 3 + 2 = 5 units/day.

Work completed by A and B in 4 days = $4 \times 5 = 20$ units. Remaining work = $36 - 20 = 16$ units.
Time taken by B to finish the remaining work = $\frac{\text{Remaining work}}{\text{Efficiency of B}}$

$$\text{Time} = \frac{16}{2} = 8 \text{ days}$$

Final Answer: B will take 8 days to finish the remaining work.

Answer: (B)

Q5.

Solution

Concept: When a train crosses an object with significant length (like a platform or a bridge), the total distance traveled is equal to the sum of the train's length and the object's length. The final speed is often converted from meters per second (m/s) to kilometers per hour (km/hr) using the conversion factor $\frac{18}{5}$.

Solution: Given: Length of train = 150 m, Length of platform = 250 m, Time = 20 seconds.

- Total Distance (D) = 150 + 250 = 400 m.
- Speed in m/s = $\frac{D}{T} = \frac{400}{20}$ = 20 m/s.

To convert m/s to km/hr:

$$\text{Speed} = 20 \times \frac{18}{5}$$

$$\text{Speed} = 4 \times 18 = 72 \text{ km/hr}$$

Final Answer: The speed of the train is 72 km/hr.

Answer: (B)

Q6.

Solution

Concept: The total expenditure is the product of price and consumption ($E = P \times C$). When expenditure is constant, price and consumption are inversely proportional. If price increases by $r\%$, the consumption must decrease by $\left(\frac{r}{100+r} \times 100\right)\%$ to maintain the same expenditure.

Solution: Let the initial price be 100 and initial consumption be 100 units. Initial Expenditure = $100 \times 100 = 10,000$.

The price increases by 20%, so the New Price = 120. To keep the expenditure at 10,000, let the new consumption be x:

$$120 \times x = 10,000$$

$$x = \frac{10,000}{120} = \frac{250}{3} = 83\frac{1}{3} \text{ units}$$

Reduction in consumption:

$$100 - 83\frac{1}{3} = 16\frac{2}{3} \text{ units}$$

Percentage reduction = $16\frac{2}{3}\%$.

Alternatively, using the formula:

$$\text{Reduction } \% = \left(\frac{20}{100+20} \times 100\right)\% = \left(\frac{20}{120} \times 100\right)\% = \frac{100}{6}\% = 16\frac{2}{3}\%$$

Final Answer: The housewife must reduce consumption by $16\frac{2}{3}\%$.

Answer: (A)

Q7.

Solution

Concept: The total sum is divided proportional to the sum of the ratio parts. The value of any individual share or the difference between shares can be found by determining the value of one "unit" of the ratio.

Solution: Given the ratio of P : Q : R is 2 : 3 : 5. Total parts = 2 + 3 + 5 = 10. Total sum = 1,200.

Value of 1 part = $\frac{1200}{10} = 120$.

The share of P = $2 \times 120 = 240$. The share of R = $5 \times 120 = 600$. Difference between P and R = $600 - 240 = 360$.

Alternatively, the difference in ratio units is $(5 - 2) = 3$. Difference = $3 \times 120 = 360$.

Final Answer: The difference between the shares of P and R is 360.

Answer: (A)

Q8.

Solution

Concept: Equations involving percentages can be simplified by removing the percentage sign (dividing both sides by 100) and then isolating the variables to find their relative ratio.

Solution: Given: $15\% \times (A + B) = 25\% \times (A - B)$. This can be written as:

$$\frac{15}{100}(A + B) = \frac{25}{100}(A - B)$$

Dividing both sides by 5:

$$3(A + B) = 5(A - B)$$

$$3A + 3B = 5A - 5B$$

Rearranging terms:

$$3B + 5B = 5A - 3A$$

$$8B = 2A \implies A = 4B$$

To find what percent of B is equal to A:

$$\text{Percentage} = \frac{A}{B} \times 100 = \frac{4B}{B} \times 100 = 400\%$$

Final Answer: 400% of B is equal to A.

Answer: (B)

Q9.

Solution

Concept: In problems involving boats and streams, the downstream speed is the sum of the boat's speed in still water and the stream's speed, while the upstream speed is their difference. The total time for a round trip is the sum of the time taken for both legs of the journey.

Solution: Speed of man in still water (x) = 6 km/h Speed of current (y) = 2 km/h

- Downstream Speed (u) = $x + y = 6 + 2 = 8$ km/h.
- Upstream Speed (v) = $x - y = 6 - 2 = 4$ km/h.

Let the distance be d km. Total time = 3 hours.

$$\frac{d}{8} + \frac{d}{4} = 3$$

Taking LCM of 8 and 4 (which is 8):

$$\frac{d + 2d}{8} = 3 \implies \frac{3d}{8} = 3$$

$$3d = 24 \implies d = 8 \text{ km}$$

Final Answer: The distance to the place is 8 km.

Answer: (B)

Q10.

Solution

Concept: The Cost Price (CP) is the base value (100%). A loss of 4% means the Selling Price (SP) is 96% of the CP. To find a price for a 10% gain, we must calculate 110% of the CP.

Solution: First Selling Price (SP_1) = 960, Loss = 4%.

$$CP = \frac{SP_1}{100 - \text{Loss}\%} \times 100$$

$$CP = \frac{960}{96} \times 100 = 10 \times 100 = 1000$$

To gain 10%, the new Selling Price (SP_2) should be:

$$SP_2 = CP \times \left(\frac{100 + \text{Gain}\%}{100}\right)$$

$$SP_2 = 1000 \times \frac{110}{100} = 1100$$

Final Answer: He should sell the article for 1,100 to gain 10%.

Answer: (A)

Q11.

Solution

Concept: Average speed for a round trip where the distance traveled is constant is not the simple arithmetic mean of the speeds. Instead, it is the harmonic mean, calculated using the formula $\frac{2xy}{x+y}$, where x and y are the speeds of the two legs of the journey.

Solution: Let the speed from P to Q be $v_1 = 40$ km/h. The return speed (v_2) is increased by 50%:

$$v_2 = 40 + \left(\frac{50}{100} \times 40\right) = 40 + 20 = 60 \text{ km/h}$$

Now, using the average speed formula for equal distances:

$$\text{Average Speed} = \frac{2 \times v_1 \times v_2}{v_1 + v_2}$$

$$\text{Average Speed} = \frac{2 \times 40 \times 60}{40 + 60}$$

$$\text{Average Speed} = \frac{4800}{100} = 48 \text{ km/h}$$

Final Answer: The average speed for the entire journey is 48 km/h.

Answer: (B)

Q12.

Solution

Concept: The relationship between workers, time, and efficiency is governed by the formula:

$$\text{Work} = \text{Men} \times \text{Days} \times \text{Efficiency}$$

If the work remains constant, the variables are inversely proportional. If efficiency doubles, the time required to complete the task is halved for the same number of workers.

Solution: 1. Calculate the total work units: 10 men × 20 days = 200 man-days (assuming initial efficiency is 1). 2. For the second scenario, we have 20 men and the efficiency is 2 (twice the original). 3. Let the required days be D. The equation is:

$$10 \times 20 \times 1 = 20 \times D \times 2$$

$$200 = 40 \times D$$

$$D = \frac{200}{40} = 5 \text{ days}$$

Final Answer: The 20 men with double efficiency will complete the job in 5 days.

Answer: (A)

Q13.

Solution

Concept: To find the smallest number that leaves a common remainder when divided by a set of numbers, we calculate the Least Common Multiple (LCM) of those numbers and add the remainder to it. The formula is:

$$\text{Required Number} = \text{LCM}(a, b, c, \dots) + \text{Remainder}$$

Solution: 1. Find the LCM of 12, 15, and 18 using prime factorization: - $12 = 2^2 \times 3$ - $15 = 3 \times 5$ - $18 = 2 \times 3^2$ 2. The LCM is the product of the highest power of each prime factor present:

$$\text{LCM}(12, 15, 18) = 2^2 \times 3^2 \times 5$$

$$\text{LCM} = 4 \times 9 \times 5 = 180$$

3. Since the division leaves a remainder of 7 in each case, add 7 to the LCM:

$$\text{Number} = 180 + 7 = 187$$

Final Answer: The smallest number which when divided by 12, 15, and 18 leaves a remainder of 7 is 187.

Answer: (B)

Q14.

Solution

Concept: To solve an infinite nested radical of the form $x = \sqrt{n + \sqrt{n + \sqrt{n + \ldots}}}$, we recognize that the expression nested within the first square root is identical to the entire expression x. This allows us to set up a quadratic equation: $x = \sqrt{n + x}$.

Solution: Let the given expression be x:

$$x = \sqrt{12 + \sqrt{12 + \sqrt{12 + \ldots}}}$$

By squaring both sides, we get:

$$x^2 = 12 + \sqrt{12 + \sqrt{12 + \ldots}}$$

Since the series is infinite, the term $\sqrt{12 + \sqrt{12 + \ldots}}$ is still equal to x:

$$x^2 = 12 + x$$

Rearrange into a standard quadratic equation:

$$x^2 - x - 12 = 0$$

Factor the quadratic:

$$(x - 4)(x + 3) = 0$$

This gives $x = 4$ or $x = -3$. Since a principal square root cannot be negative, we take:

$$x = 4$$

Final Answer: The value of the infinite radical is 4.

Answer: (B)

Q15.

Solution

Concept: This problem involves an infinite nested radical. Because the sequence of square roots is infinite, the entire expression repeating under the first radical is equivalent to the expression itself. This allows us to represent the series as a quadratic equation.

Solution: Let the given expression be equal to x:

$$x = \sqrt{12 + \sqrt{12 + \sqrt{12 + \dots}}}$$

Since the pattern continues infinitely, the portion inside the first square root is also x:

$$x = \sqrt{12 + x}$$

To solve for x, square both sides of the equation:

$$x^2 = 12 + x$$

Rearrange the terms into a standard quadratic equation:

$$x^2 - x - 12 = 0$$

Factor the quadratic equation:

$$(x - 4)(x + 3) = 0$$

This gives two possible values for x: 1. $x = 4$ 2. $x = -3$

Since the principal square root of a positive number must be positive, we discard -3. Therefore, $x = 4$.

Final Answer: The value of the expression is 4.

Answer: (B)

Q16.

Solution

Concept: To compare fractions effectively, one can use several methods: finding a common denominator, converting to decimals, or using cross-multiplication. For a quick comparison of multiple fractions, converting to decimals or comparing against a benchmark (like 0.5) is often the most efficient approach.

Solution: We will convert each fraction to its decimal equivalent to determine the largest value:

1. $**\frac{5}{8}:**$

$$5 \div 8 = 0.625$$

2. $**\frac{7}{11}:**$

$$7 \div 11 = 0.6363\ldots \text{ (or } 0.\overline{63})$$

3. $**\frac{9}{14}:**$

$$9 \div 14 \approx 0.6428$$

4. $**\frac{3}{5}:**$

$$3 \div 5 = 0.600$$

Comparing the results:

$$0.6428(\frac{9}{14}) > 0.6363(\frac{7}{11}) > 0.625(\frac{5}{8}) > 0.600(\frac{3}{5})$$

Alternatively, using cross-multiplication between the two strongest candidates ($\frac{7}{11}$ and $\frac{9}{14}$): $7 \times 14 = 98$ $11 \times 9 = 99$ Since $99 > 98$, $\frac{9}{14}$ is greater than $\frac{7}{11}$.

Final Answer: The largest fraction is 9/14.

Answer: (C)

Q17.

Solution

Concept: This problem involves the laws of exponents. When multiplying two numbers with the same base, we add their exponents:

$$a^m \times a^n = a^{m+n}$$

Additionally, we use the property $(a^m)^n = a^{m \times n}$ and the fact that a fractional exponent represents a root (e.g., $x^{0.25} = x^{1/4} = \sqrt[4]{x}$).

Solution: 1. Apply the product law of exponents:

$$(256)^{0.16} \times (256)^{0.09} = (256)^{0.16+0.09}$$

2. Add the exponents:

$$0.16 + 0.09 = 0.25$$

So, the expression becomes $(256)^{0.25}$. 3. Convert the decimal exponent to a fraction:

$$0.25 = \frac{25}{100} = \frac{1}{4}$$

The expression is now $(256)^{1/4}$. 4. Express 256 as a power of a base that has an exponent of 4:

$$256 = 4 \times 4 \times 4 \times 4 = 4^4$$

5. Simplify:

$$(4^4)^{1/4} = 4^{4 \times \frac{1}{4}} = 4^1 = 4$$

Final Answer: The simplified value is 4.

Answer: (A)

Q18.

Solution

Concept: To find the value of $x^2 + \frac{1}{x^2}$ from the given equation $x + \frac{1}{x} = 5$, we utilize the algebraic identity for the square of a binomial:

$$(a + b)^2 = a^2 + 2ab + b^2$$

In this case, setting $a = x$ and $b = \frac{1}{x}$ allows the middle term $2ab$ to simplify to a constant, as $x \cdot \frac{1}{x} = 1$.

Solution: 1. **Given equation:**

$$x + \frac{1}{x} = 5$$

2. **Square both sides:**

$$\left(x + \frac{1}{x}\right)^2 = 5^2$$

3. **Expand the left side using the identity $(a + b)^2 = a^2 + 2ab + b^2$:**

$$x^2 + 2(x)\left(\frac{1}{x}\right) + \left(\frac{1}{x}\right)^2 = 25$$

4. **Simplify the expression:**

$$x^2 + 2 + \frac{1}{x^2} = 25$$

5. **Isolate $x^2 + \frac{1}{x^2}$ by subtracting 2 from both sides:**

$$x^2 + \frac{1}{x^2} = 25 - 2$$

$$x^2 + \frac{1}{x^2} = 23$$

Final Answer: The value of $x^2 + \frac{1}{x^2}$ is 23.

Answer: (B)

Q19.

Solution

Concept: The sum of the internal angles of any polygon with n sides is given by the formula:

$$\text{Sum} = (n-2) \times 180^\circ$$

This formula applies to all simple polygons, whether they are regular or irregular.

Solution: 1. Plug the given sum into the formula:

$$(n-2) \times 180^\circ = 1080^\circ$$

2. Divide both sides by 180° to isolate the $(n-2)$ term:

$$n - 2 = \frac{1080}{180}$$

$$n - 2 = 6$$

3. Add 2 to both sides to solve for n:

$$n = 6 + 2$$

$$n = 8$$

A polygon with 8 sides is known as an octagon.

Final Answer: The polygon has 8 sides.

Answer: (C)

Q20.

Solution

Concept: This problem is solved using trigonometry within a right-angled triangle. The ladder represents the hypotenuse, and the vertical wall represents the adjacent side relative to the angle given. The relationship is defined by:

$$\cos(\theta) = \frac{\text{Adjacent}}{\text{Hypotenuse}}$$

Solution: 1. **Identify the components:** Length of the ladder (Hypotenuse) = 15 m. Angle between the ladder and the wall (θ) = 60°. Height of the wall (Adjacent side) = h.
2. **Set up the equation:** Using the cosine ratio:

$$\cos(60^\circ) = \frac{h}{15}$$

3. **Solve for h:** We know that $\cos(60^\circ) = \frac{1}{2}$ (or 0.5).

$$\frac{1}{2} = \frac{h}{15}$$

$$h = 15 \times \frac{1}{2}$$

$$h = 7.5 \text{ m}$$

Final Answer: The height of the wall is 7.5 m.

Answer: (A)

Q21.

Solution

Concept: A perpendicular line drawn from the center of a circle to a chord bisects the chord. This construction forms a right-angled triangle where:

- One leg is the distance from the center to the chord.
- The other leg is half the length of the chord.
- The hypotenuse is the radius of the circle.

We can find the radius using the Pythagorean theorem: $a^2 + b^2 = c^2$.

Solution: 1. **Identify the given dimensions:** - Length of the chord (AB) = 16 cm. - Perpendicular distance from center (O) to chord (M) = 6 cm. 2. **Bisect the chord:** Since the perpendicular from the center bisects the chord, the length of the base of our right triangle is:

$$\text{Base} = \frac{16}{2} = 8 \text{ cm}$$

3. **Apply the Pythagorean theorem:** Let r be the radius. In the right-angled triangle formed:

$$r^2 = 6^2 + 8^2$$

$$r^2 = 36 + 64$$

$$r^2 = 100$$

$$r = \sqrt{100} = 10 \text{ cm}$$

Final Answer: The radius of the circle is 10 cm.

Answer: (B)

Q22.

Solution

Concept: The volume of a cylinder is given by the formula:

$$V = \pi r^2 h$$

where r is the radius and h is the height. To find the ratio of the new volume to the original volume, we substitute the changed dimensions into the formula and compare the expressions.

Solution: 1. **Original Volume (V_1):** Let the original radius be r and height be h.

$$V_1 = \pi r^2 h$$

2. **New Dimensions:** - New radius (r') = $2r$ (doubled) - New height (h') = $\frac{h}{2}$ (halved) 3. **New Volume (V_2):**

$$V_2 = \pi (r')^2 (h')$$

$$V_2 = \pi (2r)^2 \left(\frac{h}{2}\right)$$

$$V_2 = \pi (4r^2) \left(\frac{h}{2}\right)$$

$$V_2 = 2\pi r^2 h$$

4. **Determine the Ratio:**

$$\frac{V_2}{V_1} = \frac{2\pi r^2 h}{\pi r^2 h} = \frac{2}{1}$$

The ratio is 2 : 1.

Final Answer: The ratio of the new volume to the original volume is 2:1.

Answer: (C)

Q23.

Solution

Concept: A semi-circle is half of a circle. Its area is given by $\frac{1}{2}\pi r^2$. The perimeter of a semi-circle is not just half the circumference; it includes the curved boundary plus the straight diameter. The formula for the perimeter is:

$$\text{Perimeter} = \pi r + 2r = r(\pi + 2)$$

Solution: 1. **Find the radius (r):** Given the Area = 77 sq. cm. Using $\pi = \frac{22}{7}$:

$$\frac{1}{2} \times \frac{22}{7} \times r^2 = 77$$

$$\frac{11}{7} \times r^2 = 77$$

$$r^2 = 77 \times \frac{7}{11}$$

$$r^2 = 7 \times 7 = 49$$

$$r = \sqrt{49} = 7 \text{ cm}$$

2. **Calculate the Perimeter:** Using the formula $P = \pi r + 2r$:

$$P = \left(\frac{22}{7} \times 7\right) + (2 \times 7)$$

$$P = 22 + 14$$

$$P = 36 \text{ cm}$$

Final Answer: The perimeter of the semi-circle is 36 cm.

Answer: (A)

Q24.

Solution

Concept: To find the volume of a sphere when the surface area is given, we must first determine the radius (r). The formulas required are:

- Surface Area (SA) = $4\pi r^2$
- Volume (V) = $\frac{4}{3}\pi r^3$

Solution: 1. **Find the radius (r):** Given $SA = 616$ cm^2. Using $\pi \approx \frac{22}{7}$:

$$4 \times \frac{22}{7} \times r^2 = 616$$

$$\frac{88}{7} \times r^2 = 616$$

$$r^2 = 616 \times \frac{7}{88}$$

$$r^2 = 7 \times 7 = 49$$

$$r = \sqrt{49} = 7 \text{ cm}$$

2. **Calculate the Volume (V):** Using the radius $r = 7$:

$$V = \frac{4}{3} \times \frac{22}{7} \times (7)^3$$

$$V = \frac{4}{3} \times \frac{22}{7} \times 343$$

$$V = \frac{4}{3} \times 22 \times 49$$

$$V = \frac{4312}{3} \approx 1437.33 \text{ cm}^3$$

Final Answer: The volume of the sphere is approximately 1437.33 cm^3.

Answer: (A)

Q25.

Solution

Concept: This is a coding-decoding problem based on a letter-shifting pattern. To find the logic, compare the position of each letter in the word 'ORANGE' with its corresponding letter in the code 'PSBOHF' within the English alphabet.

Solution: 1. **Analyze the pattern for 'ORANGE':**

- O $\xrightarrow{+1}$ P
- R $\xrightarrow{+1}$ S
- A $\xrightarrow{+1}$ B
- N $\xrightarrow{+1}$ O
- G $\xrightarrow{+1}$ H
- E $\xrightarrow{+1}$ F

The logic is that each letter is replaced by the **next letter** in the alphabetical sequence (+1 shift).

2. **Apply the same logic to 'APPLE':**

- A $\xrightarrow{+1}$ **B**
- P $\xrightarrow{+1}$ **Q**
- P $\xrightarrow{+1}$ **Q**
- L $\xrightarrow{+1}$ **M**
- E $\xrightarrow{+1}$ **F**

Combining these letters, we get **BQQMF**.

Final Answer: In that code, 'APPLE' is written as BQQMF.

Answer: (A)

Q26.

Solution

Concept: To solve blood relation puzzles, break the statement into parts starting from the end of the phrase. Since the speaker is an only child ("no brother or sister"), the phrase "my father's son" must refer to the speaker himself.

Solution: 1. **Analyze "my father's son":** Since the man has no siblings, his father's only son is **himself**. 2. **Substitute into the statement:** The sentence "that man's father is my father's son" becomes "that man's father is **me**." 3. **Conclusion:** If the speaker is the father of the person in the photograph, the photograph must be of **his son**.

Final Answer: The photograph was of his son's.

Answer: (A)

Q27.

Solution

Concept: Direction sense problems are best solved by tracking movements on a cardinal plane (North, South, East, West). Remember that when facing South, a "right turn" leads West and a "left turn" leads East.

Solution: 1. **First Move:** Starting from point A, the man walks 5 km South to point B. 2. **Second Move:** At point B (facing South), he turns right (moving West) and walks 3 km to point C. 3. **Third Move:** At point C (facing West), he turns left (moving South) and walks 5 km to point D. 4. **Final Position:** Point D is below and to the left of the starting point A. This combined displacement (South and West) places him in the **South-West** direction relative to the start.

Final Answer: He is in the South-West direction from the starting place.

Answer: (D)

Q28.

Solution

Concept: To complete a number series, we look for a mathematical pattern or rule that governs the transition between consecutive terms. Common patterns include arithmetic differences, geometric ratios, or progressively changing differences (series of differences).

Solution: 1. Find the difference between consecutive terms:

- $10 - 7 = 3$
- $16 - 10 = 6$
- $28 - 16 = 12$
- $52 - 28 = 24$

2. Observe the pattern in the differences: $3, 6, 12, 24, \ldots$ Each difference is exactly double the previous one ($3 \times 2 = 6, 6 \times 2 = 12, \ldots$). 3. Calculate the next difference in the sequence:

$$24 \times 2 = 48$$

4. Add this difference to the last term to find the missing number:

$$52 + 48 = 100$$

Final Answer: The missing number in the series is 100.

Answer: (C)

Q29.

Solution

Concept: This problem is a mathematical operation puzzle where symbols are substituted. The key is to replace the given symbols with their actual mathematical meanings and then solve the resulting expression using the **BODMAS/PEMDAS** rule (Brackets, Orders, Division/Multiplication, Addition/Subtraction).

Solution: 1. **Map the symbols:**

- + becomes $\times$
- $-$ becomes $\div$
- $\div$ becomes +

2. **Rewrite the expression $20 + 8 - 4 \div 2$ with new symbols:**

$$20 \times 8 \div 4 + 2$$

3. **Apply BODMAS (perform division and multiplication from left to right):**

- First, the division: $8 \div 4 = 2$
- The expression becomes: $20 \times 2 + 2$
- Next, the multiplication: $20 \times 2 = 40$
- Finally, the addition: $40 + 2 = 42$

Final Answer: The value of the expression is 42.

Answer: (B)

Q30.

Solution

Concept: To find the total number of people in a row when positions are interchanged, we look for a single "spot" in the row where we know the distance from both the left and the right. The total number of people is calculated as:

$$\text{Total} = (\text{Position from Left} + \text{Position from Right}) - 1$$

We subtract 1 because the same person is being counted twice (once from each side).
Solution: 1. **Initial Positions:** Anil is 7th from Left. Rohit is 9th from Right. 2. **Interchange:** Anil moves to Rohit's old spot. 3. **New Information:** In this new spot (which we already know is 9th from the Right), Anil is now 11th from the Left. 4. **Calculate Total:**

$$\text{Total} = (\text{Anil's new Left position} + \text{Rohit's old Right position}) - 1$$

$$\text{Total} = (11 + 9) - 1$$

$$\text{Total} = 20 - 1 = 19$$

Final Answer: There are 19 students in the row.

Answer: (A)

Q31.

Solution

Concept: Syllogisms are solved by determining if a conclusion *must* be true based on the given statements. We use Venn diagrams to visualize the relationships between sets (Singers, Dancers, and Actors).
Solution: 1. **Analyze Statement I:** "All singers are dancers." This means the circle for "Singers" is entirely inside the circle for "Dancers." 2. **Analyze Statement II:** "Some dancers are actors." This means the circle for "Actors" overlaps with "Dancers." Crucially, it *might* overlap with "Singers," but it doesn't *have* to. 3. **Evaluate Conclusion I:** "Some singers are actors." Since there is no definite link established between Singers and Actors in the statements, this conclusion does not necessarily follow. 4. **Evaluate Conclusion II:** "Some actors are dancers." Since "Some dancers are actors," it is logically certain that "Some actors are dancers." This is a valid conversion.
Final Answer: Only conclusion II follows.

Answer: (B)

Q32.

Solution

Concept: To select the correct Venn diagram, we must define the logical set relationships:

- **Male and Father:** Every father is biologically male. Therefore, the set of "Fathers" is a proper subset of "Males." (One circle entirely inside another).
- **Doctor:** A doctor can be a father, a male who is not a father, or someone who is neither (a female). Therefore, the "Doctor" set must overlap with both "Father" and "Male."

Solution: 1. Draw a circle for **Fathers**. 2. Place that circle entirely inside a larger circle for **Males** (since all fathers are male). 3. Draw a third circle for **Doctors** that intersects both the "Father" circle and the "Male" circle, while also having a portion outside the "Male" circle to represent female doctors. 4. This matches the description: "One circle inside another, and a third overlapping both."
Final Answer: The relationship is represented by option A.

Answer: (A)

Q33.

Solution

Concept: For circular seating arrangements, start with a fixed piece of information (like "left" or "right") and place the other individuals relative to that point. In a circle facing the center, "left" moves in a clockwise direction.
Solution: 1. **Fixed point:** Place D at a position. Since F is to the left of D, F is clockwise from D. 2. **B's position:** We are told B is between F and C. Since we know where F is, B must be next to F, and C must be next to B. (Order: D, F, B, C). 3. **A's position:** A is between E and D. Since we already placed D, A must be on the other side of D, and E must be next to A. 4. **Final Sequence (Clockwise):** $D \rightarrow F \rightarrow B \rightarrow C \rightarrow E \rightarrow A \rightarrow$ (back to D). 5. **Conclusion:** Looking at the circle, the person sitting between A and F is **D**.
Final Answer: D is between A and F.

Answer: (B)

Q34.

Solution

Concept: To find a person's rank from the opposite end, we use the fundamental ranking formula:

$$\text{Total Number of Students} = (\text{Rank from Top} + \text{Rank from Bottom}) - 1$$

We subtract 1 because when we add both ranks together, the specific individual (Ayush) is counted twice.

Solution: 1. **Identify the given values:** * Total students = 45 * Rank from top = 15 2. **Set up the equation:**

$$45 = (15 + \text{Rank from Bottom}) - 1$$

3. **Simplify and solve:**

$$45 = 14 + \text{Rank from Bottom}$$

$$\text{Rank from Bottom} = 45 - 14$$

$$\text{Rank from Bottom} = 31$$

Alternatively, you can think of it as: there are $45 - 15 = 30$ students behind Ayush. Therefore, Ayush is the next person, making him 31st from the bottom.

Final Answer: Ayush's rank from the bottom is 31st.

Answer: (B)

Q35.

Solution

Concept: When a transparent sheet is folded along a dotted line, the pattern on the folded part is **mirrored** over the fold line and superimposed onto the other part. Since the sheet is transparent, both the original pattern on the stationary side and the reflected pattern from the folded side will be visible simultaneously.

Solution: 1. **Identify the Fold Line:** The dotted line is a diagonal running from the top-left corner to the bottom-right corner. 2. **Analyze the Movement:** The arrows indicate that the top-right half of the sheet is being folded onto the bottom-left half. 3. **Reflect the Pattern:**

- The **circle** is located in the top-right section.
- When folded across the diagonal line, its position will be mirrored to the bottom-left section.
- In the original image, the triangle is already sitting in the bottom-left section.

4. **Determine the Result:** After folding, the circle will land directly over the area where the triangle is located. Because the sheet is transparent, the circle and the triangle will appear to **overlap** or be merged on the bottom-left half, while the top-right half will appear empty/clear.

Final Answer: The correct representation is that the sheet appears blank on one side of the diagonal with both shapes merged on the other.

Answer: (D)

Q36.

Solution

Concept: To solve paper folding and punching problems, we use the principle of **symmetry**. Each time a paper is unfolded, the existing holes are mirrored across the crease (fold line).

- A square paper folded twice (into a smaller square) consists of **4 layers**.
- Any punch made through these layers will be multiplied by the number of layers when fully unfolded.

Solution: 1. **Calculate the number of holes:** A standard square paper folded twice (once horizontally/vertically and once more) creates 4 layers. If 3 triangular holes are punched through all 4 layers, the total number of holes in the unfolded paper must be:

$$3 \text{ holes} \times 4 \text{ layers} = 12 \text{ holes}$$

This immediately narrows the choices to (A) or (C).
2. **Determine the arrangement:**

- When holes are punched near the "closed" center corner of a folded paper, they create a centralized pattern when unfolded.
- As the paper is unfolded step-by-step, the 3 triangles are mirrored once to create 6, and then that set of 6 is mirrored again to create 12.
- In a standard twice-folded square where punches are made near the center fold, the resulting 12 triangles typically form a **diamond or circular cluster** in the middle of the sheet.

Final Answer: The correct unfolded pattern is a pattern of 12 triangles forming a diamond shape in the center of the paper.

Answer: (A)

Q37.

Solution

Concept: The Nobel Peace Prize is awarded annually to individuals or organizations that have made significant contributions to peace. The 2023 prize recognized efforts against the oppression of women and the promotion of human rights.
Solution: 1. **Narges Mohammadi** is an Iranian human rights activist and the deputy head of the Defenders of Human Rights Center. 2. In 2023, the Norwegian Nobel Committee decided to award her the Nobel Peace Prize "for her fight against the oppression of women in Iran and her fight to promote human rights and freedom for all." 3. The other nominees listed (Maria Ressa, Ales Bialiatski, and Denis Mukwege) are all previous Nobel Peace Prize laureates from earlier years.
Final Answer: The Nobel Peace Prize 2023 was awarded to Narges Mohammadi.

Answer: (A)

Q38.

Solution

Concept: The G20 (Group of Twenty) is an international forum for the governments and central bank governors from 19 countries and the European Union. The presidency of the G20 rotates annually among its members.

Solution: 1. **Indonesia** held the presidency in 2022 (Bali Summit). 2. **India** assumed the G20 presidency on December 1, 2022, and hosted the 18th G20 Summit in New Delhi on September 9–10, 2023. The theme was "Vasudhaiva Kutumbakam" (One Earth, One Family, One Future). 3. **Brazil** hosted the summit in 2024, and **South Africa** is scheduled for 2025.

Final Answer: India hosted the G20 Summit in 2023.

Answer: (B)

Q39.

Solution

Concept:ISRO (Indian Space Research Organisation) is the national space agency of India. Its leadership is appointed by the Government of India. As of early 2024, the chairperson was S. Somanath, who oversaw the historic Chandrayaan-3 mission.**Solution:**S. Somanath assumed charge as the 10th Chairperson of ISRO in January 2022, succeeding K. Sivan. He remained in office throughout 2024.K. Sivan was the chairperson from 2018 to early 2022.A.S. Kiran Kumar served as chairperson from 2015 to 2018.G. Madhavan Nair served as chairperson from 2003 to 2009.(Note: In January 2025, Dr. V. Narayanan succeeded S. Somanath as the chairperson.)**Final Answer:**The Chairperson of ISRO in early 2024 was S. Somanath.

Answer: (A)

Q40.

Solution

Concept: The ICC Men's Cricket World Cup 2023 was the 13th edition of the tournament, hosted entirely by India. The winner was determined in the final match held at the Narendra Modi Stadium in Ahmedabad.**Solution:**The Final: The final match was played between India and Australia on November 19, 2023.Match Summary: India batted first and scored 240 runs. Australia successfully chased the target, scoring 241/4 in 43 overs.Result: Australia won the match by 6 wickets to claim their 6th World Cup title. Travis Head was named the Player of the Match for his century (137 runs).**Final Answer:**Australia won the ICC Men's Cricket World Cup 2023.

Answer: (B)

Q41.

Solution

Concept: The host city for the Olympic Games is selected by the International Olympic Committee (IOC) several years in advance. The 2024 edition marks the return of the Summer Games to Europe.

Solution: 1. **Tokyo** hosted the 2020 Summer Olympics (held in 2021 due to the pandemic). 2. **Paris** was officially awarded the 2024 Summer Olympics. This event coincides with the centenary of the 1924 Paris Games. 3. **Los Angeles** is scheduled to host the 2028 Summer Olympics. 4. **Brisbane** is scheduled to host the 2032 Summer Olympics.

Final Answer: The 2024 Summer Olympics will be held in Paris.

Answer: (B)

Q42.

Solution

Concept: The Fundamental Rights in the Indian Constitution (Articles 12 to 35) ensure the dignity of the individual. Specific articles address social inequalities and discriminatory practices.

Solution: 1. **Article 14:** Deals with "Equality before law." 2. **Article 17:** Explicitly states that "'Untouchability' is abolished and its practice in any form is forbidden." It makes the enforcement of any disability arising out of untouchability an offense punishable in accordance with law. 3. **Article 19:** Protects certain rights regarding freedom of speech, etc. 4. **Article 21:** Deals with the "Protection of life and personal liberty."

Final Answer: Article 17 deals with the 'Abolition of Untouchability'.

Answer: (B)

Q43.

Solution

Concept: The Governor-General of India was the highest-ranking British official in the Indian subcontinent. During the Revolt of 1857 (also known as the First War of Independence), the transition from East India Company rule to the British Crown began.

Solution: 1. **Lord Dalhousie** served from 1848 to 1856. While his "Doctrine of Lapse" was a major cause of the unrest, he left India just before the revolt started. 2. **Lord Canning** assumed office in 1856 and was the Governor-General during the **Revolt of 1857**. After the revolt, he also became the first Viceroy of India under the Government of India Act 1858. 3. **Lord Bentinck** is known for social reforms (like the abolition of Sati) in the 1830s. 4. **Lord Lytton** served much later, from 1876 to 1880.

Final Answer: The Governor-General during the Revolt of 1857 was Lord Canning.

Answer: (B)

Q44.

Solution

Concept: Several rivers in India are nicknamed "Sorrow" of a particular region because of the devastating floods they cause annually, leading to loss of life, property, and crops.

Solution: 1. **Kosi River** is known as the **'Sorrow of Bihar'**. It is notorious for frequently changing its course and causing massive flooding in the plains of Bihar due to heavy siltation and the steep gradient from the Himalayas. 2. **Damodar River** was historically known as the 'Sorrow of Bengal' before the construction of the Damodar Valley Corporation (DVC) projects. 3. **Gandak** and **Son** are other major rivers in Bihar, but they are not typically referred to by this specific epithet.

Final Answer: The Kosi river is known as the 'Sorrow of Bihar'.

Answer: (B)

Q45.

Solution

Concept: The Dandi March, also known as the Salt Satyagraha, was a major non-violent protest action led by Mahatma Gandhi. It was a direct action campaign of tax resistance and nonviolent protest against the British salt monopoly in colonial India.

Solution: 1. **Context:** The march began from Sabarmati Ashram to the coastal village of Dandi. 2. **Date:** The march lasted from March 12 to April 6, **1930**. 3. **Significance:** It marked the start of the Civil Disobedience Movement. * **1919** is associated with the Rowlatt Act and Jallianwala Bagh. * **1920** is the start of the Non-Cooperation Movement. * **1942** is the year of the Quit India Movement.

Final Answer: The Dandi March took place in 1930.

Answer: (B)

Q46.

Solution

Concept: Vitamins are essential nutrients that the body needs in small amounts to function properly. A deficiency occurs when the body does not get enough of a particular vitamin, leading to specific medical conditions or diseases.

Solution: 1. **Vitamin A deficiency:** Leads to Night Blindness (Xerophthalmia). 2. **Vitamin B deficiency:** Various types lead to Beriberi (B_1) or Pellagra (B_3). 3. **Vitamin C deficiency:** Leads to **Scurvy**, characterized by swollen, bleeding gums and the opening of previously healed wounds. Vitamin C is found abundantly in citrus fruits. 4. **Vitamin D deficiency:** Leads to Rickets in children and Osteomalacia in adults.

Final Answer: Scurvy is caused by the deficiency of Vitamin C.

Answer: (C)

Q47.

Solution

Concept: Pressure is defined as the force applied perpendicular to the surface of an object per unit area over which that force is distributed.

$$\text{Pressure}(P) = \frac{\text{Force}(F)}{\text{Area}(A)}$$

The SI unit is derived from the units of force (Newton) and area (Square meter).

Solution: 1. **Newton per square meter (N/m^2):** This is the base derivation for pressure. 2. **Pascal (Pa):** This is the specific name given to the SI unit of pressure in honor of Blaise Pascal. 1 Pa = 1 N/m^2. 3. **Other options:** * **Joule:** SI unit of Energy/Work. * **Newton:** SI unit of Force. * **Watt:** SI unit of Power.

Final Answer: The SI unit of Pressure is Pascal.

Answer: (C)

Q48.

Solution

Concept: Many common household chemicals have specific scientific names and chemical formulas based on their molecular composition. Baking soda is a leavening agent used in cooking.

Solution: 1. **Sodium Bicarbonate:** This is the chemical name for Baking Soda. Its chemical formula is $NaHCO_3$. 2. **Comparison with other options:** * **Sodium Carbonate (Na_2CO_3):** Known as Washing Soda. * **Calcium Carbonate ($CaCO_3$):** Found in Limestone, Chalk, and Marble. * **Sodium Chloride ($NaCl$):** Common Table Salt.

Final Answer: The chemical name of Baking Soda is Sodium Bicarbonate.

Answer: (B)

Q49.

Solution

Concept: The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris, France, on 12 December 2015.

Solution: 1. **Objective:** The main goal of the agreement is to hold "the increase in the global average temperature to well below 2°C above pre-industrial levels" and pursue efforts "to limit the temperature increase to 1.5°C above pre-industrial levels." 2. **Focus:** It specifically addresses greenhouse gas emissions mitigation, adaptation, and finance. 3. **Other options:** While international bodies exist for Nuclear Disarmament (NPT), Trade (WTO), and Human Rights (UNHRC), the Paris Agreement is the hallmark accord for environmental protection.

Final Answer: The Paris Agreement is primarily related to Climate Change.

Answer: (C)

Q50.

Solution

Concept: The Earth's atmosphere is divided into several layers based on temperature gradients. Each layer has distinct characteristics and serves different protective functions.

Solution: 1. **Troposphere:** The lowest layer where weather occurs. 2. **Stratosphere:** This layer extends above the troposphere. It contains the **Ozone Layer** (O_3), which absorbs and scatters the solar ultraviolet (UV) radiation, protecting life on Earth. 3. **Mesosphere:** The layer above the stratosphere where most meteors burn up. 4. **Exosphere:** The outermost layer that gradually fades into outer space.

Final Answer: The Stratosphere contains the Ozone layer.

Answer: (B)

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	A	2	C	3	A	4	B	5	B
6	A	7	A	8	B	9	B	10	A
11	B	12	A	13	B	14	B	15	B
16	C	17	A	18	B	19	C	20	A
21	B	22	C	23	A	24	A	25	A
26	A	27	D	28	C	29	B	30	A
31	B	32	A	33	B	34	B	35	D
36	A	37	A	38	B	39	A	40	B
41	B	42	B	43	B	44	B	45	B
46	C	47	C	48	B	49	C	50	B