

TOTAL QUESTIONS-10,
TIME – 10 MINUTES,
MARKS –10
MATH

- Arrange the following in ascending order $\sqrt{3}, \sqrt[3]{4}, \sqrt[4]{8}, \sqrt[6]{28}$.
 A) $\sqrt[3]{4}, \sqrt[4]{8}, \sqrt[6]{28}, \sqrt{3}$ B) $\sqrt[3]{4}, \sqrt[4]{8}, \sqrt{3}, \sqrt[6]{28}$,
 C) $\sqrt[6]{28}, \sqrt{3}, \sqrt[4]{8}, \sqrt[3]{4}$ D) $\sqrt{3}, \sqrt[6]{28}, \sqrt[4]{8}, \sqrt[3]{4}$
- If a wire is bent into the shape of a square, then the area of the square so formed is 81 cm^2 . When the wire rebent into a semicircular shape, then the area, (in cm^2) of the semicircle will be (Take $\pi = \frac{22}{7}$)
 A) 22 B) 44 C) 77 D) 154
- The value of $\frac{3}{1^2 2^2} + \frac{5}{2^2 3^2} + \frac{7}{3^2 4^2} + \frac{9}{4^2 5^2} + \frac{11}{5^2 6^2} + \frac{13}{6^2 7^2} + \frac{15}{7^2 8^2} + \frac{17}{8^2 9^2} + \frac{19}{9^2 10^2}$ is
 A) $\frac{1}{100}$ B) $\frac{99}{100}$ C) $\frac{101}{100}$ D) 1
- Marbles of diameter 1.4 cm are dropped into a cylindrical beaker containing some water and are fully submerged. The diameter of the beaker is 7 cm. Find how many marbles have been dropped in it if the water rises by 5.6 cm
 A) 50 B) 150 C) 250 D) 350
- At each corner of a triangular field of sides 26m, 28m and 30m, a cow is tethered by a rope of length 7m. Then area (in m^2) ungrazed by the cows is
 A) 336 B) 259 C) 154 D) 77
- If $x + \frac{1}{y} = 1$ and $y + \frac{1}{z} = 1$, then $z + \frac{1}{x}$ is equal to
 A) 2 B) $\frac{1}{2}$ C) 1 D) 0
- If the 3rd term of GP is 12 and the 6th term is 96, then what is the sum of the 9th term?
 A) 1533 B) 318 C) 1890 D) 918
- If the mean of $x_1, x_2, x_3, \dots, x_n$ are n no. Of observations is M. If $\sum_{i=1}^n (x_i - 12) = -10$ $\sum_{i=1}^n (x_i - 3) = 62$.
 Then find the value of n.
 A) 10 B) 12 C) 8 D) None of these
- For what value of λ the roots of the equation $x^2 + 2(\lambda - 4)x + 2\lambda = 0$ will be equal?
 A) -2, -8 B) 2, -8 C) -2, 8 D) 2, 8
- In a frequency distribution, the mid-value of a class is 15 and the class intervals is 4. The lower limit of the class is
 A) 10 B) 12 C) 13 D) 14

Answers Keys

- B 6 C
- C 7 A
- B 8 C
- B 9 D
- B 10 C

EXPLANATIONS

1. B;

$$\sqrt{3}, \sqrt[3]{4}, \sqrt[4]{8}, \sqrt[6]{28}.$$

 Power $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{6}$

Lcm of 2, 3, 4 and 6 = 12

$$3^6, 4^4, 8^3, 28^2$$

 ASCENDING - $4^4, 8^3, 3^6$ AND 28^2

Hence option B is correct

$$\sqrt[3]{4}, \sqrt[4]{8}, \sqrt{3}, \sqrt[6]{28},$$

2. c;

$$\text{Side of square} = \sqrt{81} = 9 \text{ cm}$$

$$\therefore \text{Total length of wire} = 4 \times 9 = 36 \text{ cm}$$

$$\text{Now, perimeter of semicircle} = \pi r + 2r$$

$$\Rightarrow r(\pi + 2) = 36$$

$$\Rightarrow r = \frac{36}{\pi + 2} = \frac{36}{\frac{22}{7} + 2}$$

$$= \frac{36}{\frac{36}{7}} = \frac{36}{36} \times 7 = 7 \text{ cm}$$

$$\therefore \text{Area of semi-circle} = \frac{\pi r^2}{2} = \frac{22}{7 \times 2} \times 7 \times 7$$

$$= 77 \text{ sq. cm}$$

3. b;

$$\text{Required value} = \frac{2^2 - 1^2}{1^2 \cdot 2^2} + \frac{3^2 - 2^2}{2^2 \cdot 3^2} + \dots + \frac{10^2 - 9^2}{9^2 \cdot 10^2}$$

$$= \left(1 - \frac{1}{2^2}\right) + \left(\frac{1}{2^2} - \frac{1}{3^2}\right) + \dots + \left(\frac{1}{9^2} - \frac{1}{10^2}\right) = 1 - \frac{1}{100} = \frac{99}{100}$$

4. b;

Volume of raised water in cylindrical beaker

$$= \pi r^2 h = \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 5.6$$

$$= 215.6 \text{ cu. cm}$$

$$\text{Volume of a marble} = \frac{4}{3} \pi r^3$$

$$= \frac{4}{3} \times \frac{22}{7} \times (0.7)^3$$

$$= \frac{4.312}{3} \text{ cu. cm}$$

$$\therefore \text{Number of marbles} = \frac{215.6}{\frac{4.312}{3}} = \frac{215.6 \times 3}{4.312} = 150$$

5. b;

$$\begin{aligned} \text{Area grazed by all cows} &= \frac{180^\circ}{360^\circ} \pi r^2 = \frac{\pi r^2}{2} \\ &= \frac{1}{2} \times \frac{22}{7} \times 7 \times 7 \\ &= 77 \text{ sq. metre} \end{aligned}$$

Semi-perimeter of triangular field(s)

$$= \frac{26 + 28 + 30}{2} = 42 \text{ metre}$$

$$\begin{aligned} \therefore \text{Area of the field} &= \sqrt{s(s-a)(s-b)(s-c)} \\ &= \sqrt{42(42-26)(42-28)(42-30)} \\ &= \sqrt{42 \times 16 \times 14 \times 12} = 336 \text{ sq. metre} \end{aligned}$$

\therefore Area ungrazed by the cows

$$= 336 - 77 = 259 \text{ sq. metre}$$

6. c;

$$\text{Given, } x + \frac{1}{y} = 1 \Rightarrow x = 1 - \frac{1}{y} \Rightarrow x = \frac{y-1}{y}$$

$$\text{And } y + \frac{1}{z} = 1 \Rightarrow \frac{1}{z} = 1 - y \Rightarrow z = \frac{1}{1-y}$$

$$\begin{aligned} \therefore z + \frac{1}{x} &= \frac{1}{x} + \frac{y}{y-1} \\ &= \frac{1-y}{1-y} = 1 \end{aligned}$$

7. a;

Let a & r be the first term & common ratio of given G.P. then according to given conditions

$$ar^2 = 12 \quad (1)$$

$$ar^5 = 96 \quad (2)$$

dividing (2) by (1),

$$\frac{ar^5}{ar^2} = \frac{96}{12}$$

$$r^3 = 8 \implies r = 2, a = 3$$

hence, the sum of first 9 terms

$$S_9 = \frac{a(r^9-1)}{r-1}$$

$$= \frac{3(2^9-1)}{2-1}$$

$$= \frac{3(512-1)}{1}$$

$$= 1533$$

8. c;

$$\sum_{i=1}^n (x_i - 12) = (x_1 - 12) + (x_2 - 12) + (x_3 - 12) + \dots + (x_n - 12) = -10$$

$$\implies (x_1 + x_2 + \dots + x_n) - 12n = -10$$

$$\Rightarrow nM - 12n = -10 \quad \dots\dots (i)$$

Similarly

$$\sum_{i=1}^n (x_i - 3) = 62$$

$$\Rightarrow nM - 3n = 62 \quad \dots\dots (ii)$$

Subtracting eqn (ii) from eqn (i) we can get

$$-9n = -72$$

$$\Rightarrow n = \frac{72}{9} = 8$$

9. d;

The roots of the equation will be equal if $D = 0$

$$\text{Or, } (2(\lambda - 4)^2 - 4.1.2\lambda) = 0$$

$$\text{or, } 4(\lambda^2 - 8\lambda + 16) - 4.2\lambda = 0$$

$$\text{Or, } 4\{\lambda^2 - 8\lambda + 16 - 2\lambda\} = 0$$

$$\text{or, } \lambda^2 - 10\lambda + 16 = 0$$

$$\text{Or, } (\lambda - 2)(\lambda - 8) = 0$$

$$\text{or, } \lambda = 2, 8$$

10. c;

In a discrete frequency distribution the cumulative frequency of a particular value of the variable is the total of all the frequencies of the values of the variable which are less than or equal to the particular value.

Let the lower limit be l and upper limit be u .

$$\text{Then, } u - l = 4 \dots (1)$$

$$\text{and } \frac{2u + 1}{2} = 15 \text{ or } u + l = 30 \dots (2)$$

Subtracting (2) and (1),

$$u + l - u + l = 30 - 4$$

$$2l = 26$$

$$l = 13$$

Thus, lower limit = 13

ALL THE POWER IS WITHIN YOU; YOU CAN DO ANYTHING AND EVERYTHING BELIEVE IN THAT; DON'T BELIEVE THAT YOU ARE WEAK. STAND UP AND EXPRESS THE DIVINITY WITHIN YOU"
