A-0865

Total Pages : 5 **Roll No. ----------**

MA-10

Elementary Mathematics

Examination 2024(Dec.)

Time: 2:00 hrs Max. Marks: 100

Note : This paper is of Hundred (100) marks divided into Two (02) Section A and B. Attempt the questions contained in these sections according to the detailed instructions given therein. Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

P.T.O.

Section-A (Long-Answer-Type Questions)

Note : Section 'A' contains Five (05) long-answer-type questions of Twenty Six (26) marks each. Learners are required to answer any Two (02) questions only.

[2x26=52]

Q.1. (a) Vishakha offers a discount of 20% on all the terms at her shop and still makes a profit of 12%. What is the cost price of an article marked at Rs. 280?

(b) Express $\log(a^2b) - \frac{1}{2}\log b^4$ in its simple form.

Q.2. A circular track has a radius of 35 meters. A runner completes one lap around the track, covering an angle of 2π radians (the full circle). Calculate:

a. The total distance covered by the runner (circumference of the circle).

b. The area enclosed within the circular track.

Q.3. Show that

$$\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}+\sqrt{\frac{1+\sin\theta}{1-\sin\theta}}=-2\sec\theta$$

Q.4. A cylinder has a radius of 5 cm and a height of 20 cm. Calculate:

a. The surface area of the cylinder.

b. The volume of the cylinder.

Q.5. A right prism has a triangular base with a base of 10 cm, a height of 6 cm, and the height of the prism is 15 cm. Find:

a. The area of the triangular base.

b. The volume of the right prism.

c. The surface area of the right prism.

P.T.O.

Section-B (Short-Answer-Type Questions)

Note : Section 'B' contains Eight (08) short-answer-type questions of Twelve (12) marks each. Learners are required to answer any Four (04) questions only.

[4x12=48]

Q.1. A lady bought an air-conditioner for Rs. 15,200 and spent Rs. 300 and Rs. 500 on its transportation and repair respectively. At what price should she sell it to make a gain of 15%?

Q.2. If A+B+C can do a work in 6 days, A + B can do a work in 8 days and A + C can do a work in 10 days.

Q.3. Sum of two non co-prime numbers a, b and their HCF gives 77. What is the number of possible values of (a, b).

Q.4. Prove that $\frac{\sec 8\theta - 1}{\sec 4\theta - 1} = \frac{\tan 8\theta}{\tan 2\theta}$

Q.5. Find the mean for the following frequency distribution by Direct Method.

Class	Frequency
20-40	9
40-60	11
60-80	14
80-100	6
100-120	8
120-140	15
140-160	12
Total	75

Q.6. Show that $\log_a b . \log_b a = 1$.

Q.7. If $a = 2^3 . 5^2$ and $b = 2^4 . 5^3$, express $\frac{b}{a}$ as a single power of 2 and 5.

Q.8. A cube has a side length of 10 cm. Find its surface area and volume.

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