Total Pages : 4   Roll No. ....

EMT-10/MA-10

ELEMENTARY MATHEMATICS

Examination, June 2025

Time : 2:00 Hrs.   Max. Marks : 100

Note :– This paper is of Hundred (100) marks divided into Two (02) Sections '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.***

Section–A

Long Answer Type Questions   2×26=52

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.

1. (a) A sum of Rs.4000 is lent on simple Interest at the rate of 10% per annum. The Simple interest for 5 years is how more than the simple interest for 3 years.

    (b) Using change of base formula, evaluate $\log_5 125$ and verify the result by expressing it in terms of powers.

2. A circle has a radius of 14cm. A chord of the circle subtends a central angle of 1.2 radians. Calculate :

    (a) The length of the chord.

    (b) The area of the segment of the circle (the area bounded by the chord and the arc).

3. A cylinder has a radius of 4 cm and a height of 12 cm. Calculate :

    (a) The surface area of the cylinder.

    (b) The volume of the cylinder.

    (c) The lateral surface area of the cylinder.

4. If $\tan A = \dfrac{3}{4}$ and $\tan B = \dfrac{5}{12}$, where A and B are in the first quadrant, find :

    (a) $\sin (A + B)$

    (b) $\cos (A - B)$

5. The following data represents the marks obtained by a group of 15 students in a test :

45, 50, 55, 60, 65, 60, 70, 75, 70, 80, 85, 75, 80, 90, 95, find :

(a) The mean of the marks.

(b) The median of the marks.

Section–B

Short Answer Type Questions   4×12=48

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.

1. A lady buys some pencils for Rs 3 and an equal number for Rs 6. She sells them for Rs 7. Find her gain or loss %.

2. A takes 8 day to finish a piece of work. B takes 10 days to finish the same work. How long will it take to finish the work when both of them are working together ?

3. The HCF of the two numbers is 29 & their sum is 174. What are the numbers ?

4. Solve the equation $\sin \theta + \sin 3\theta + \sin 5\theta = 0$.

5. Find the median of the following data :

Class	Frequency
40	2
41	5
42	7
43	8
44	13
45	26
46	6
48	3

6. Simplify $\log_2 8 + \log_2 4 - \log_2 16$.

7. A cuboid has dimensions 8 cm, 6 cm, and 4 cm. Find its surface area and volume.

8. Find Exact Values of $\sin (75°)$ and $\cos (75°)$.

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