Total Pages : 6 **Roll No. .....**

MA-10

Elementary Mathematics

Examination February, 2026

Time : 2:00 Hrs. Max. Marks : 70

Note* :–** This paper is of Seventy (70) 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 (2×19=38)

***Note* :–** Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any *two* (02) questions only.

1. (a) A sum of ₹ 7,700 is lent out in two parts in such a way that the interest on one part at 20% for 5 yr. is equal to that on another part at 9% for 6 yr. Find the two sums.

   (b) If you deposit $ 8000 into an account paying 7% annual interest compounded quarterly, how long until there is $ 12400 in the account ?

2. (a) In a right triangle, the adjacent side is 12 units, and the hypotenuse is 13 units. Find the cosine (cos) of the angle B.

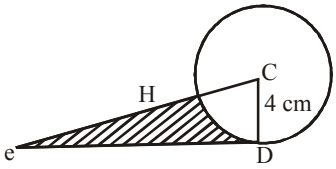
   (b) Prove that :

$$\frac{\sin x - \sin 3x}{\cos x + \cos 3x} = \tan 2x$$

3. A circle has a centre and radius 4 cm. The diagram shows the circle with the point D, which lies on the circle. The tangent at D passes through the point E. $EC = \sqrt{65}$ cm . Find :

   (a) The size of the radians of the angle DCE.

(b) The area of the shaded region DEH.



4. (a) In a trapezium, the parallel sides measure 40 cm and 20 cm. Calculate the area of the trapezium if its non-parallel sides are equal having the lengths of 26 cm.

(b) If the ratio of the height of the cylinder to the radius of the cylinder is 3 : 2 and the curved surface area of the cylinder is 1848 cm 2. If the radius of the cylinder is equal to the radius of the cone and the height of the cone is 9 cm, then what is the volume of the cone ?

5. (a) If $3^{(x-y)} = 27$ and $3^{x+y} = 243$, find the value of x and y.

(b) What is the median of the following data set ?

32, 6, 21, 10, 8, 11, 12, 36, 17, 16, 15, 18, 40, 24, 21, 23, 24, 24, 29, 16, 32, 31, 10, 30, 35, 32, 18, 39, 12, 20

Section–B

Short Answer Type Questions (4×8=32)

***Note* :–** Section 'B' contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. (a) A semi-circular window has an area of 154 cm^2. If we assume $\pi = 3.14$, can you calculate the diameter of this window ?

   (b) If :

$$\sin(A-B)=\frac{1}{2},\ \cos(A+B)=\frac{1}{2},$$

$$0^0 < A+B < \frac{\pi}{2}, A > B.$$

   Find A and B.

2. (a) Find the mean of the first 20 odd integers.

   (b) Find the exact value of sin(15°).

3. Find the general solution of $\sin 3x + \sin 5x + \sin 7x = 0$.

4. Consider the following frequency distribution. Calculate the mean weight of students :

Weight	No. of Students
31-35	9
36-40	6
41-45	15
46-50	3
51-55	1
56-60	2
61-65	2
66-70	1
71-75	1

5. Evaluate $125^{2/3} \times 625^{3/4}$.

6. (a) Find the value of x, if :

$$\log(x + 5) + \log(x - 5) = 4 \log 2 + 2 \log 3$$

(b) Find x if :

$$\log 7 (2x^2 - 1) = 2$$

7. To do a certain piece of work, B would take three times as long as A and C together and C twice as long as A and B together. The three men working together can complete the work in 10 days. How long would B take by himself to complete the same piece of work ?

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

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