P-864

MA-10

Elementary Mathematics

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4th Semester Examination, 2023 (June)

Time : 2 Hours]   **[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 answer to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

SECTION–A
(Long Answer Type Questions)

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.

(2×19=38)

1. If the sum of the first 14 terms of an AP is 150 and its first term is 10, find the 20th terms.

2. (a) In a right triangle ABC, right angled at B, if tan A = 1, then verify that 2 sin A cos A =1.

(b) Evaluate

$$\frac{\sin 30° + \sin 45° - \csc 60°}{\sin 30° + \cos 60° + \cot 45°}$$

3. Find the compound interest on Rs 8000 at 15% per annum for 2 years 4 months, compound annually.

4. A shopkeeper offers his customers 10% discount and still makes a profit of 26%. What is the actual cost to him of an article of marks 280?

5. The height of the cylinder is 160 cm and diameter of the base is 28 cm. Find its curves surface area, total surface area and volume.

SECTION–B

(Short Answer Type Questions)

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.   (4×8=32)

1. Find the 10th term of A.P.: 2,7,12……

2. Find an irrotational number between $\dfrac{1}{7}$ and $\dfrac{2}{7}$.

3. Find the mean, median & mode of 6, 8, 11, 5, 2, 9, 7, 8.

4. If 60000 amount to 68694 in 2 year then find the rate of interest.

5. A cycle was purchased for 1600 and sold for 1400. Find the Loss and Loss %.

6. (a) If $\dfrac{\log a}{b-c} = \dfrac{\log b}{c-a} = \dfrac{\log c}{a-b}$, prove that $a^a.b^b.c^c = 1$.

   (b) Prove that $4\,\dfrac{24}{25} - 16 \log \dfrac{9}{10} + 7 \log \dfrac{81}{80} = \log 5$.

7. If the mean of the following data 20.2, find the value of k.

x_i	10	15	20	25	30
f_i	6	8	20	k	6

8. (a) If $\tan(A + B) = \sqrt{3}$ and $\tan(A + B) = \dfrac{1}{\sqrt{3}}$, $0 < A + B \leq 90°$; $A > B$ find A and B.

(b) Prove that $\dfrac{\cot A - \cos A}{\cot A + \cos A} = \dfrac{\operatorname{cosec} A - 1}{\operatorname{cosec} A + 1}$.

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