

**K-986**

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[Roll No. ....

**MA-10**

**Year Examination Dec., 2023**

**ELEMENTARY MATHEMATICS**

**Time : 2 Hours]**

**[Max. Marks : 70**

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*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 there in. 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.*

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( 1 )

P.T.O.

1. The height of the cylinder is 200 cm and diameter of the base is 30 cm. Find its curved surface area, total surface area and volume.
2. If the sum of the first 20 terms of an AP is 200 and its first term is 10, find the 20th terms.
3. Mohit sells a bicycle to Rohit at a gain of 10% and Rohit again sells it to Jyoti at a profit of 5%. If Jyoti pays ₹ 462 to Rohit. What is the cost price of the bicycle for Mohit.
4. (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 :
$$\frac{\sin 45^\circ + \sin 90^\circ - \operatorname{cosec} 30^\circ}{\sec 60^\circ + \cos 30^\circ + \cot 60^\circ}$$
5. Some amount out of ₹ 7000 was lent at 6% per annum and the remaining at 4% per annum. If the total simple interest from both the fractions in 5 years was ₹ 1600, find the sum lent at 6% per annum.

## Section–B

(Short Answer Type Questions)  $4 \times 8 = 32$

**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. Find an irrational number between  $\frac{2}{7}$  and  $\frac{3}{7}$ .
2. Find the 20th term of A. P. : 3, 8, 13, 18, ..., ...
3. Find the mean, median and mode of 6, 8, 11, 5, 2, 9, 7, 8.
4. If the C.P. of 6 articles is equal to the S.P. of 4 articles. Find the gain per cent.
5. How much % must be added to the cost price of goods so that a profit of 20% must be made after throwing off a discount of 10% from the marked price ?
6. The shadow of a tower standing on a level ground is found to be 40 m longer when the Sun's altitude is  $30^\circ$  than when it is  $60^\circ$ . Find the height of the tower.
7. If the mean of the following data 30.5, find the value of  $k$ .

$x_i$	10	15	20	25	30
$f_i$	2	3	7	$k$	6

8. (a) If  $\angle B$  and  $\angle Q$  are acute angles such that  $\sin B = \sin Q$ , then prove that :

$$\angle B = \angle Q$$

- (b) In triangle ABC, right-angled at B, if  $\tan A = \tan$

$A = \frac{1}{\sqrt{3}}$ , find the value of :

(i)  $\sin A \cos C + \cos A \sin C$

(ii)  $\cos A \cos C - \sin A \sin C$

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