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Total Pages : 5

Roll No.

MA-10

(Elementary Mathematics)

Examination, 2024 (June)

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) $2 \times 19 = 38$

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. Given an arithmetic progression where the first term a is 5 and the common difference d is 3, answer the following questions :
 - (a) Find the 10th term of the AP.
 - (b) Find the sum of the first 15 terms of the AP.
 - (c) If the 20th term is 62, verify if this is correct given the values of a and d .

2. A cylinder has a radius of 3 cm and a height of 5 cm. A cone has the same radius and height. A sphere has a radius of 3 cm. Find the curved surface area, total surface area, and volume of each shape.

3. A shopkeeper buys a set of 50 books at a total cost of ₹ 1,000. He sells 30 of these books at ₹ 25 each and the remaining 20 books at ₹ 15 each. Answer the following questions :
 - (a) Calculate the cost price per book.
 - (b) Calculate the total revenue from selling all the books.
 - (c) Determine if the shopkeeper made a profit or a loss and calculate the amount and percentage of profit or loss.

4. In ΔABC , the lengths of sides a , b and c are 7, 24 and 25 units respectively. Answer the following questions : Determine if ΔABC is a right triangle. Find the measures of angles A , B and C .
5. An amount of ₹ 12,000 is divided into two parts and invested for 2 years. One part is invested at 8% per annum compounded annually, and the other part is invested at 6% per annum compounded annually. If the total amount after 2 years is ₹ 13,493.12, find the amount invested at each rate.

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. Prove that $\sqrt{2}$ is an irrational number.
2. In an arithmetic progression, the 6th term is 23 and the 12th term is 47. Find :
 - (a) The first term a of the arithmetic progression.

- (b) The common difference d .
- (c) The sum of the first 20 terms of the arithmetic progression.
3. An item is purchased for ₹ 500 and later sold for ₹ 650. Calculate the gain percentage.
4. Find the mean, median and mode of 6, 8, 11, 5, 2, 9, 7, 8.
5. A person stands at point A on level ground and sights the top of a pole at point B. The angle of elevation to the top of the pole is 30° . The person walks 20 meters further away from the pole along the straight line AB and finds that the angle of elevation to the top of the pole is now 15° . Calculate the height of the pole.
6. In triangle, ABC, $\angle A = 30^\circ$ $\angle B = 90^\circ$ and $\angle C = 60^\circ$. The side opposite $\angle A$ is $BC = 2$. Find the lengths of sides AB and AC :
- (a) The area of triangle ABC.
- (b) The circumradius of triangle ABC.
7. 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 ?

8. Given the following grouped data representing the number of hours spent on a project by employees in a company :

x_i	f_i
0–10	5
10–20	8
20–30	12
30–40	10
40–50	5

Calculate the mean number of hours spent on the project.
