8/2   Roll No. …………………..

MA–10

Elementary Mathematics

Elementary Mathematics (MA–10)

Examination, 2017

Time : 3 Hours   **Max. Marks : 80**

Note : This paper is of **eighty (80)** marks containing **three (03)** Sections A, B and C. Learners are required to attempt the questions contained in these Sections according to the detailed instructions given therein.

Section–A
(Long Answer Type Questions)

Note : Section 'A' contains four (04) long answer type questions of nineteen (19) marks each. Learners are required to answer *two* (02) questions only.

1. (a) A man deposited ₹ 1,000 in a bank. In return he got ₹ 1,331. Bank give interest 10% per annum. How long did he keep the money in the bank ?   7

   (b) Ronald buys a cycle for ₹ 3,680 and sells it at a gain of $7\frac{1}{2}\%$. For how much does he sell it ?   6

   (c) A and B can do a piece of work in 18 days. B and C can do it in 24 days; A and C can do it in 36 days. In how many days will A, B, C finish it working together.   6

2. (a) The sum of a rational number and its reciprocal is 13/6. Find the number.   7

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(b) What is the Highest Common Factor (HCF) for 108, 288 and 360 ?   6

(c) What is the least common multiple (L. C. M.) of 104 and 169 ?   6

3. (a) If $A + B + C = 180°$, then prove that :   7

$$\tan A + \tan B + \tan C = \tan A \tan B \tan C$$

(b) Find the values of sin 75° and sin 15°.   6

(c) Prove that :   6

$$\frac{\tan A + \tan B}{\cot A + \cot B} = \tan A \tan B$$

4. (a) Calculate the median of the following distribution :   7

Class	Frequency
0—8	8
8—16	26
16—24	30
24—32	20
32—40	16
40—48	10

(b) Calculate the arithmetic mean of the following distribution :   6

Class	Frequency
20—30	8
30—40	26
40—50	30
50—60	20
60—70	16

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(c) Find the surface area of the cuboid whose length, breadth and height are 6 mt, 5 mt., 3 mt. respectively.   6

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 *four* (04) questions only.

1. (a) A sum of ₹ 800 amounts to ₹ 920 in 3 years at simple interest. If the interest rate is increased by 3%, it would amount to how much ?

   (b) Find compound interest on ₹ 7,500 at 4% per annum for 2 years, compounded annually.

2. (a) If a radio is purchased for ₹ 490 and sold for ₹ 465.50, find the loss percent.

   (b) If the cost price is 96% of the selling price, the what is the profit percent ?

3. (a) Alok along can finish a piece of work in 12 days and Vinod alone can do it in 15 days. If both of them work at it together, how much time will they take to finish it ?

   (b) A and B can complete a piece of work in 4 days. If A alone can complete the same work in 12 days, in how many days can B alone complete the work ?

4. (a) Find the HCF of 2923 and 3239.

   (b) Find the LCM of 22, 54, 108, 135 and 198.

5. (a) The sum of two numbers is 184. If one-third of one exceeds one seventh of the other by 8, find the smaller number.

    (b) If the sum of two numbers is 15 and the sum of their squares is 113, find the numbers.

6. (a) Prove that :

    $$\log \frac{75}{16} - 2\log \frac{5}{9} + \log \frac{32}{243} = \log 2$$

    (b) If $2^{x-1} + 2^{x+1} = 1280,$ then find the value of x.

7. (a) Prove that :

    $$\frac{\sin A}{1+\cos A} + \frac{1+\cos A}{\sin A} = 2\operatorname{cosec} A$$

    (b) Find the value of $\tan 315°$.

8. (a) Calculate the arithmetic mean of first n natural numbers.

    (b) Find median of the following data :

    9, 10, 15, 7, 11, 9, 8, 11, 7, 9, 10

Section–C

(Objective Type Questions)

Note : Section 'C' contains ten (10) objective type questions of one (1) mark each. All the questions of this Section are compulsory.

1. Ram bought a cycle for ₹ 1,000 and sold it for ₹ 800, the loss is :

    (a) 20%

    (b) 40%

    (c) 60%

    (d) 80%

2.   If cost price is C and selling price is S, then the % gain is :

   (a) $\dfrac{C-S}{C}.100$

   (b) $\dfrac{S-C}{C}.100$

   (c) $\dfrac{C-S}{S}.100$

   (d) $\dfrac{S-C}{S}.100$

3.   If principal amount P, time is T and rate of interest is R, then simple interest is :

   (a) $\dfrac{P \times R}{100 \times T}$

   (b) $\dfrac{P \times T}{100 \times R}$

   (c) $\dfrac{R \times T}{100 \times P}$

   (d) $\dfrac{P \times R \times T}{100}$

4.   A can do a piece of work in 3 days, B can do it in 6 days. How long will A and B take to complete the work working together ?

   (a)   2 days

   (b)   3 days

   (c)   4 days

   (d)   5 days

5.   Highest common factor of 12 and 18 is :

  (a)   3

  (b)   6

  (c)   12

  (d)   36

6.   If $\cos A = \dfrac{4}{5}$, then the value of $\tan A = ?$

  (a) $\dfrac{3}{5}$

  (b) $\dfrac{3}{4}$

  (c) $\dfrac{4}{3}$

  (d) $\dfrac{5}{3}$

7.   Given that $\tan\theta = \dfrac{a}{b}$, the value of $\sin\theta = ?$

  (a) $\dfrac{a}{\sqrt{a^2+b^2}}$

  (b) $\dfrac{b}{\sqrt{a^2+b^2}}$

  (c) $\dfrac{\sqrt{a^2+b^2}}{b}$

  (d) $\dfrac{\sqrt{a^2+b^2}}{a}$

8. Mean of the numbers 1, 2, 3, 4, 5 is :
   (a) 2
   (b) 2.5
   (c) 3
   (d) 3.5

9. Perimeter of a rectangle having length L and breadth B is :
   (a) L + B
   (b) L B
   (c) 4 L B
   (d) 2 (L + B)

10. Mode of the series 2, 3, 4, 3, 5, 6, 5, 3, 2, 4, 2, 3, 7 :
   (a) 2
   (b) 3
   (c) 4
   (d) 5

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