(B-44) P. T. O.

Roll No.

MA-10

Elementary Mathematics

Elementary Mathematics (MA-10) First Semester, Examination, 2018

Time : 3 Hours

Max. Marks: 80

Note: This paper is of eighty (80) marks containing three (03) Sections A, B and C. 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.
- (a) Mr. Harish invested an amount of ₹ 15,000 divided in two different schemes A and B at the simple interest rate of 12% per year and 10% per year respectively. If the total amount of simple interest earned in 2 years be ₹ 3,120, what was the amount invested in Scheme B?
 - (b) A shopkeeper forms a mixture of two different types A and B of same item by mixing 26 kg of type A at ₹ 20 per kg and 30 kg of type B at ₹ 36 per kg and sells the mixture at ₹ 30 per kg. Find the profit percent of the shopkeeper.

2. (a) A invested 80% as much money as B, C invested 60% as much money as B. The total of all the three is ₹ 72,000. How much did A, B and C invest ?

(b) Find the smallest number which on adding 13 to it is exactly divisible by 28, 36 and 45. 6

Show that :

$$\frac{1}{1 + x^{(b-a)} + x^{(c-a)}} + \frac{1}{1 + x^{(a-b)} + x^{(c-b)}} + \frac{1}{1 + x^{(b-c)} + x^{(a-c)}} = 1$$

3. (a) If $\log_{10} x + \log_{10} (x - 3) = \log_{10} (x + 3) + 1$, find the value of x. 7

(c)

(c)

$$\frac{1+\tan x}{1+\cot x} = \frac{\sin x + \tan x}{1+\cos x}$$

(c) Prove that :

 $\tan x \sin x + \cos x = \sec x$

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

Class	Frequency
100—150	12
150—200	13
200—250	17
250—300	8

6

6

(b)	Calculate median for the following data :		6
	Class	Frequency	
	200—300	3	
	300—400	5	
	400—500	20	
	500—600	10	
	600—700	6	

(c) The length and breadth of a field is in the ratio
5 : 2. If the area of the field is 250 square metre, then find the area of the second field with length triple and breadth double of the first field.

Section-B

(Short Answer Type Questions)

- **Note :** Section 'B' contains eight (08) short answer type questions of eight (8) marks each. Learners are required to answer *four* (04) questions only.
- (a) How much time will it take for an amount of ₹ 1,000 to yield ₹ 75 as simple interest if the rate of interest is 5% per annum ?
 - (b) Find the compounded interest on ₹ 30,000 at the rate of 7% per annum for 2 years.
- (a) If a profit of 13% is earned by selling a bulb for ₹ 226, then what was the purchase price ?
 - (b) A box bought for ₹ 450 is sold at a profit of 30%.Find the selling price.

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- 3. (a) Mohan can do a piece of work in 25 days and Ramesh can finish it in 20 days. They work together for 5 days and then Mohan leaves. In how many days will Ramesh finish the remaining work ?
 - (b) A number is as much greater than 36 as is less than 86. Find the number.
- 4. (a) Find the least number exactly divisible by 12, 15, 20 and 27.
 - (b) Two numbers are in the ratio 15 : 11. If their H. C. F. is 13, find the numbers.

5. (a) If
$$2^{x} \times 8^{\frac{1}{5}} = 2^{\frac{1}{5}}$$
, then find the value of x.

(b) Prove that :

$$3\log\frac{32}{27} - 2\log\frac{64}{81} + \log\frac{9}{16} = \log\frac{3}{2}$$

6. (a) Factorize the expression :

$$3x^2 + 17x - 6$$

(b) Prove that :

$$\cos \frac{5\pi}{2} \cos \frac{3\pi}{2} + \sin \frac{5\pi}{2} \sin \frac{3\pi}{2} = -1$$

7. (a) Calculate the arithmetic mean of the following data :

<i>x</i>	f
35	5
38	3
40	4
45	2
52	1

(b) Define Mode with the help of suitable example.

- [5]
- 8. (a) If the diagonal of a rectangle is 17 cm long and its perimeter is 46 cm, find the area of the rectangle.
 - (b) Find the surface are of a rectangular prism with length 8 cm, breadth 6 cm and height 4 cm.

Section-C

(Objective Type Questions)

- **Note :** Section 'C' contains ten (10) objective type questions of one (01) mark each. All the questions of this Section are compulsory.
- 1. Preeti bought a toy for ₹ 120 and sold it for ₹ 90, then loss is :
 - (a) 20%
 - (b) 25%
 - (c) 33.3%
 - (d) 40%
- If cost price is ₹ 20 and selling price is ₹ 25, then the % gain is :
 - (a) 20%
 - (b) 25%
 - (c) 33.3%
 - (d) 40%
- 3. The simple interest on ₹ 1,000 for a period of 3 years at interest rate 7% per annum is :
 - (a) ₹120
 - (b) ₹150
 - (c) ₹210
 - (d) ₹70

- 4. Suresh can do a piece of work in 4 days, Bhuwan can do it in 6 days. How long will it take to complete the work if they both work together ?
 - (a) 12/5 days
 - (b) 5/12 days
 - (c) 3 days
 - (d) 5 days
- 5. Highest common factor of 160 and 240 is :
 - (a) 8
 - (b) 10
 - (c) 40
 - (d) 80
- 6. $\cos 120^\circ =$
 - (a) 1/2
 - (b) -1/2
 - (c) $\sqrt{3} / 2$
 - (d) $-\sqrt{3}/2$

7. Given that $\tan x = \frac{3}{4}$, then the value of sin $x + \cos x =$ (a) $\frac{3}{5}$ (b) $\frac{4}{5}$ (c) $\frac{7}{5}$ (d) 1

- 8. Median of the numbers 5, 3, 7, 6, 9, 4 is :
 - (a) 5
 - (b) 5.5
 - (c) 6
 - (d) 6.5
- 9. Surface are of a cube with side length 3 cm is :
 - (a) 54 cm sq.
 - (b) 27 cm sq.
 - (c) 18 cm sq.
 - (d) None of these
- 10. Area of a triangle with height 6 cm and base 8 cm is :
 - (a) 48 cm sq.
 - (b) 64 cm sq.
 - (c) 36 cm sq.
 - (d) 24 cm sq.

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