

MA-10

Elementary Mathematics

Elementary mathematics (MA-10)

Examination 2019

Time : 3 Hrs

Maximum Marks : 80

Note: This paper is of Eighty (80) marks divided into 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 any two (02) questions only.

$$(2 \times 19 = 38)$$

1. (a) An amount of Rs. 50000 is invested in two types of shares. The first yields an interest of 7% per year and the second, 5% per year. If the total interest at the end of one year 6.25% then find the amount invested in each share. (07)
- (b) By selling 45 items for Rs. 40, a person loses 20%. Find the number of items should the person sell for Rs. 24 to gain 20%? (06)
- (c) A and B can do a piece of work in 12 days; B and C can do it in 15 days while C and A can finish it in 20 days. In how many days will each one of them finish it, working alone? (06)
2. (a) Ramesh started a business with a capital of Rs. 10000. After six months, Mohan joined him with

investment of some capital. If at the end of the year, each of them gets equal amount as profit, how much did Mohan invest more than Ramesh? (7)

(b) Find the number which divides 170 and 98 leaving 8 as remainder. (6)

(c) Show that $(x^b/x^c)^{b+c-a} + (x^c/x^a)^{c+a-b} + (x^a/x^b)^{a+b-c} = 1$ (6)

3. (a) If $\log_2 x + \log_2 (x+5) = \log_2 (x+1) + \log_2 6$, find the value of x. (7)

(b) Prove that $\tan A + \cot B / \cot A + \tan B = \tan A / \tan B$. (6)

(c) Prove that $(1 - \cos x)(1 + \cot^2 x)(1 + \cos x) = 1$ (6)

4. (a) Find the cost of carpeting a room 15 m long and 12 m wide with a carpet 0.75 m wide at the rate of Rs. 8.00 per meter length.

(b) Define Mean, Median and mode find mean, median and mode for the following data:

12, 15, 18, 11, 10, 20, 25, 18, 15, 22, 30, 18, 10.

Section – B

(Short Answer Type Questions)

Note : Section 'B' contains eight short answer type questions of Eight marks each. Learners are required to answer any 04 questions only. (4 x 8 = 32)

1. (a) Mohan took a loan from a bank at the rate of 15 % p.a. simple interest. After 3 years he had to pay Rs. 9000 as interest only. The principal amount borrowed by him?

(b) Find compound interest on Rs. 25000 at 12% per annum for 3 years.

2. (a) Rohit buys a cycle for Rs. 3680 and sells it at a gain of $7\frac{1}{2}\%$. Find the selling price.

(b) By selling an item for Rs. 672, Mukesh incurs $20\frac{2}{3}\%$ loss. Find the purchase cost.

3. (a) A is twice as good as a workman as B. they together finish a piece of work in 18 days. In how many days will a alone finish the work ?
 (b) The average of four consecutive even numbers is 27. Find the largest number.
4. (a) find L.C.M of 16,24,36 and 54.
 (b) Find H.C.F. of 108,288, and 360.
5. (a) if $5^{(x+3)} = 25^{(3x+4)}$, then find the value of X.
 (b) Prove that
- $$\log \frac{a^2}{b^2} + \log \frac{b^2}{a^2} + \log \frac{c^2}{ab} = 0.$$
6. (a) Factorize the algebraic expression $x^2 - 2x - 15$.
 (b) evaluate the value of $\sin 15^\circ$.
7. (a) Prove that $\tan x + \cot x = \sec x \operatorname{cosec} x$.
 (b) The average marks secured by 36 students was 52. Later on it was discovered that an item 64 was misread as 46. Find the correct mean.
8. (a) Find the surface area of a cylinder whose radius is 4 cm and height is 8 cm.
 (b) The length of a side of a cubical room is 6 mt. if the cost of painting is Rs. 8 per sq. mt., then find the cost of painting the inner walls of the room.

Section – C

(Objective-type questions)

Note : Section 'C' contains ten objective type questions of one (01) mark each. All questions of this section are compulsory. (10 x 1 = 10)

1. Ram bought a cycle for Rs. 1000 and sold it at 8 % profit. The selling price is
 (a) Rs. 1800 (b) Rs. 1080 (c) Rs. 1008 (d) None of these
2. If cost price is Rs. 20 and selling price is Rs. 16, then the loss percent is
 (a) 20% (b) 25% (c) 33.3% (d) 40%

3. Rakesh alone can do a work 12 days. Mohan alone can do the same work in 8 days. How many days will it take to complete the work if both work together.
 (a) 6 days (b) $14/5$ days (c) $24/5$ days (d) 10 days
4. Least common multiple of 12,15 and 18 is
 (a) 180 (b) 360 (c) 720 (d) 1440
5. $\log 256 =$
 $\log 16$
 (a) 16 (b) 0 (c) 1 (d) 2
6. Which is the correct factorization of $x^2-3x-28$
 (a) $(x-4)(x+7)$ (b) $(x+4)(x+7)$
 (c) $(x-4)(x-7)$ (d) $(x+4)(x-7)$
7. $\cot 30^\circ$
 (a) $1/\sqrt{3}$ (b) $1/3$ (c) $\sqrt{3}$ (d) $-1/\sqrt{3}$
8. Given that $\sec x = 5/3$ the value of $\cot x =$
 (a) $3/5$ (b) $3/4$ (c) $4/3$ (d) $5/3$
9. The mean of three numbers is 10, x, 25 is 17. The value of x is
 (a) 14 (b) 16 (c) 17 (d) 18
10. Surface area of a cylinder with height h and radius r is
 (a) $2r^2 + 2rh$ (b) $2r + 2rh$
 (c) $2r^2 + 2rh^2$ (d) $2r^2 + rh$
