

2023

MDC

Paper : MDC0100203

Foundation of Mathematical Science-1

Time: 2 Hours

Full Mark: 45

The figures in the margin indicate full marks for the question.

1. (i) The real number nearer to 1 is 1x5=5
(A) 0.9, (B) 0.99 (C) 1.01 (D) None of the given
- (ii) For binary addition
 $1+1+1+1=?$
- (iii) Give an example of a pair of Co-Prime numbers.
- (iv) Write in interval $\{x|x \in \mathbb{R}, 2 < x < 3\}$
- (iv) 2 is what percent of 50 ?
2. Answer any five (5) questions. 2x5=10
- (a) Prove that $\sqrt{2}$ is irrational numbers.
- (b) Evaluate $(110110)_2 + (11111)_2$
- (c) Divide $(1111)_2$ by $(101)_2$
- (d) Prove that $\log_2 \log_2 \log_2 16=1$
- (e) Prove that $\log_a (m \times n) = \log_a m + \log_a n$
- (f) Convert the binary number
 $(110101)_2$ in decimal number.
- (g) Convert the decimal number 37 to binary number.
- (h) Solve: $\log_{10} (3x+2) - \log_{10} (x-1) = 1$
- (i) Bipul invests Rs. 72318, which is 17% of his annual income, in mutual funds. What is his monthly income?

- (j) If Rs. 2516 is the cost price and Rs. 2272 is the selling price of a commodity, find the percentage of loss.

3. Answer any five (5) questions. 4x5=20

- (a) A television manufacturer earns 20% profit by selling each T.V. set for Rs. 14,400. If the production cost is increased by 15%, what should be the new selling price of a set so as to gain 15%?
- (b) Two-thirds of a consignment was sold at a profit of 5% and the remainder at a loss of 2%. If the total profit was Rs. 400, find the value of the consignment.
- (c) The ratio of milk and water in 64 liters of a mixture is 5:3. What amount of water is added to make the ratio 3:5 ?
- (d) If $(x+y) : (x-y) = 7:3$, then find the ratio $(x^3+y^3) : (x^3-y^3)$
- (e) If 5 students utilize 18 pencils in 9 days, how long, at the same ratio, will 66 pencils last for 15 students ?
- (f) Show that $A.M. > G.M > H.M$
- (g) A Test in algebra attended by 400 high School children of whom 150 were boys and 250 were girls. The mean score of boys was 72 and that of girls was 73. Find the mean score of the combined groups.
- (h) If Roger can do a piece of work in 8 days and Antony can complete the same work in 5 days, in how many days will both of them together complete it?

4. Answer any two (2) from the following. 5x2=10

- (a) Discuss about the different methods of collecting primary data.
- (b) Discuss about the number systems Naturals, Integers, Rationals, Irrationals and Reals.
- (c) Discuss the scope and limitation of statistics.
- (d) Discuss the importance and applications of statistics in different fields.