

**MATHEMATICS**

Time:3 hours

Max. Marks.=100

**GENERAL INSTRUCTIONS:-**

- I. Each question from Sl.No. 1 to 12 is of 4 marks.
- II. Each question from Sl.No. 13 to 19 is of 5 marks.
- III. Each question from Sl.No. 20 to 25 is of 6 marks.

**Solve any 10 (ten) questions.**

1. Find the largest number that will divide 398, 436 and 542 having remainders 7, 11 and 15 respectively.
2. A chess board contains 64 equal squares and the area of each square is  $6.25 \text{ cm}^2$ . A border round the board is 2 cm. wide. Find the length of the side of the chess board.
3. Find the number of integers between 50 and 500 which are divisible by 7.
4. How many terms of the sequence 54, 51, 48 ... be taken so that their sum is 513?
5. If  $\tan \theta + \cot \theta = 2$ , find the value of  $\tan^2 \theta + \cot^2 \theta$
6. Find the area of the triangle formed by the points A(5, 2), B(4, 7) and C(7, -4)
7. The three vertices of a parallelogram taken in order are (-1, 0), (3, 1) and (2, 2) respectively. Find the co-ordinates of the fourth vertex.
8. Tickets numbered from 1 to 20 are mixed up together and then a ticket is drawn at random. What is the probability that the ticket has a number which is a multiple of 3 or 7?
9. A letter is chosen at random from the letters of the word, "ASSASSINATION". Find the probability that the letter chosen is a (i) vowel (ii) consonant.
10. Find the H.C.F. of 96 and 404 by the prime factorization method.
11. A 20 m deep well with diameter 7 m is dug and the earth from digging is evenly spread out to form a platform 22 m by 14 m. Find the height of the platform.
12. Divide 16 into two parts such that twice the square of the larger part exceeds the square of the smaller part by 164.

**Solve any 6 (six) questions.**

13. Find all the zeros of the polynomial  $p(x) = 2x^4 - 3x^3 - 3x^2 + 6x - 2$ , if two of its zeros are  $\sqrt{2}$  and  $-\sqrt{2}$ .
14. Divide the polynomial  $p(x) = 6x^3 + 11x^2 - 39x - 65$  by the polynomial  $q(x) = x^2 - 1 + x$ . Also find the quotient and remainder.
15. A man has only 20 paise coins and 25 paise coins in his purse. If he has 50 coins in all totaling Rs.11.25. How many coins of each kind does he have?
16. Ten years ago, father was twelve times as old as his son and ten years hence, he will be twice as old as his son will be. Find their present ages.
17. A fraction becomes  $\frac{4}{5}$ , if 1 is added to both numerator and denominator. If, however, 5 is subtracted from both numerator and denominator, the fraction becomes  $\frac{1}{2}$ . What is the fraction?

- 18.** The sum of the squares of three numbers is 116 and their ratio is 2:3:4. Find the numbers.
- 19.** One-fourth of a herd of camels was seen in the forest, twice the square root of the herd had gone to mountains and the remaining 15 camels were seen on the bank of a river. Find the total number of camels.

**Solve any 5 (five) questions.**

- 20.** A person standing on the bank of a river observes that the angle of elevation of the top of a tree standing on the opposite bank is  $60^\circ$ . When he moves 40 m away from the bank, he finds the angle of elevation to be  $30^\circ$ . Find the height of the tree and the width of the river.
- 21.** A fast train takes 3 hours less than a slow train for a journey of 600 km. if the speed of the slow train is 10 km/hr less than that of the fast train, find the speed of the two trains.
- 22.** 8 men and 12 women can finish a piece of work in 10 days while 6 men and 8 women can finish it in 14 days. Find the time taken by one man alone and that by one woman alone to finish the work.
- 23.** The median of the following data is 28.5. Find the values of x and y if the total frequency is 60.

Class interval	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Frequency	5	x	20	15	y	5

- 24.** Water is flowing at the rate of 5 km/hr through a pipe of diameter 14 cm. into a rectangular tank which is 50 m long and 44 m wide. Determine the time in which the level of water in the tank will rise by 7 cm.
- 25.** A man sold a chair and a table together for Rs.1520, thereby making a profit of 25 % on the chair and 10% on the table. By selling them together for Rs. 1535, he would have made a profit of 10% on the chair and 25% on the table. Find the cost price of each.