

Maharaja Surchandya College.

B.A / B.Sc. (General) Sem - IV Internal Examinations 2023.

Paper Code (Theoretical) - MTHS - G - CC - 4 - 4 TH

Full Marks - 10

Answer any five questions:

1. Let $A = \{1, 2, 3\}$, and $B = \{8, 9\}$

Find whether the following subsets of $A \times B$ are functions from A to B .

(i) $f_1 = \{(1, 8), (1, 9), (2, 8), (3, 9)\}$

(ii) $f_2 = \{(1, 9), (2, 9), (3, 9)\}$

2. Check whether the following operation $*$ on S is binary.

$$S = \mathbb{R}^+; * (a, b) = a + \log b$$

3. If a groupoid $(S, *)$ contains an identity element, then show that it is unique.

4. Let a, b, c be arbitrary elements of a group $(G, *)$. If $a * b = a * c$, then $b = c$.

5. Find the characteristic equation of the matrix $\begin{bmatrix} 1 & 2 \\ -1 & 3 \end{bmatrix}$

6. Calculate $(123)_{10} = (?)_8$.

7. For two independent events A and B , prove that $P(A \cap B) = 1 - P(A^c)P(B^c)$.