22MAT121-Discrete Mathematics
AIE-B

SET-A

1. Check whether the relation $R = \{((a,b),(c,d)) : a/c \text{ and } b/d\}$ defined on $A = \mathbb{Z}^+ \times \mathbb{Z}^+$ is reflexive, symmetric, antisymmetric, and/or transitive. [6 Marks]

2. Let R and S be the relations defined on a set A with the matrix representations $M_R = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 1 & 0 \\ 1 & 0 & 1 \end{bmatrix}$ and $M_S = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$ respectively. Find $M_{R\cup S}$, $M_{R\cap S}$, $M_{S\circ R}$. [4 Marks]

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2. Check whether the relation $R = \{((a,b),(c,d)) : a = c \text{ or } b = d\}$ defined on $A = \mathbb{Z}^+ \times \mathbb{Z}^+$ is reflexive, symmetric, antisymmetric, and/or transitive. [6 Marks]

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