

系所：_____ 學號：_____ 姓名：_____ (4/10)

The following are some binary relations on $\{1, 2, 3, 4\}$.

$$R_1 = \{(1, 1), (2, 2), (3, 3), (4, 4), (1, 2), (2, 1)\}.$$

$$R_2 = \{(1, 2), (2, 1), (3, 4), (4, 3)\}.$$

$$R_3 = \{(1, 2), (1, 3), (2, 3), (3, 4)\}.$$

$$R_4 = \{(1, 1), (2, 2), (2, 3), (3, 4), (2, 4)\}.$$

Please indicate which are reflexive, irreflexive, symmetric, asymmetric, antisymmetric, and transitive.

Sol. reflexive : R_1

irreflexive : R_2, R_3

symmetric : R_1, R_2

asymmetric : R_3

antisymmetric : R_3, R_4

transitive : R_1, R_4