

Question 1. Relation R defined on the set $A = \{1, 2, 3, 4\}$ by $R = \{(1, 1), (2, 2), (3, 3)\}$ is

- (a) reflexive;
- (b) symmetric;
- (c) transitive;
- (d) none of these.

Solution. (a) It is not reflexive, because $(4, 4) \notin R$.

(b) It is symmetric, since for any $(a, b) \in R$ we have $a = b$, so $(b, a) = (a, b) \in R$.

(c) Let $(a, b), (b, c) \in R$. Then $a = b$ and $b = c$, therefore, $(a, c) = (a, b) = (b, c) \in R$.

Answer: R is

- (a) not reflexive;
- (b) symmetric;
- (c) transitive.

□