## Answer on Question #46918 – Math – Discrete Mathematics

## Problem.

Any subset of A × A is called a relation on the set A. A relation R on A is symmetric if  $(a, b) \in R \Rightarrow (b, a) \in R \forall a, b \in A$ . Give one example each, with justification, of

i) a symmetric relation on ,

ii) a relation that is not symmetric on the set {2, 3, 5, 7}.

## **Remark:**

The statement is incorrectly formatted. Is suppose that correct statement is "Any subset of A × A is called a relation on the set A. A relation R on A is symmetric if (a, b)  $\in R \Rightarrow$  (b, a)  $\in R \forall a, b \in A$ . Give one example each, with justification, of

i) a symmetric relation on  $\mathbb{N}$ ,

**ii)** a relation that is not symmetric on the set {2, 3, 5, 7}. " (see <u>http://ignou.ac.in/userfiles/MTE-04%20(E)%202014.pdf</u>)

## Solution:

i) The subset  $R_i = \{(n, n) \in \mathbb{N} : n \in \mathbb{N}\}$  is a symmetric relation on  $\mathbb{N}$ , because if  $(a, b) \in R_i$ , then a = b and  $(a, a) = (b, a) \in R_i$ .

ii) The subset  $R_{ii} = \{(2,3), (3,5), (5,7)\}$  is not symmetric on the set, as  $(2,3) \in R_{ii}$  and  $(3,2) \notin R_{ii}$ .

**Answer:** i)  $R_i = \{(n, n) \in \mathbb{N} : n \in \mathbb{N}\}, \text{ ii}\} R_{ii} = \{(2, 3), (3, 5), (5, 7)\}.$