## Answer on Question \#46918 - Math - Discrete Mathematics

## Problem.

Any subset of $A \times A$ 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 $\operatorname{set}\{2,3,5,7\}$.

## Remark:

The statement is incorrectly formatted. Is suppose that correct statement is
"Any subset of $A \times A$ 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 http://ignou.ac.in/userfiles/MTE-04\ (E)\ 2014.pdf)

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

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

