Page No.
Date

Illustrations

1. Let $S = \{1,3,5\}$; $T = \{2,3,4,5,7\}$
Then $S \cup T = \{1,2,3,4,5,7\}$ and
$S \cap T = \{3,5\}$.

2. Let $E = \{\ldots\ldots -6,-4,-2,0,2,4,6,\ldots\}$
$O = \{\ldots\ldots -5,-3,-1,1,3,5,\ldots\}$

Then $E \cup O = I$ (set of integers).
and $E \cap O = \{\ \} = \phi$
Thus, E and O are disjoint sets.

Note:- It will help to remember the following results:

$$\left.\begin{array}{l} x \in S \cup T \Rightarrow x \in S \text{ or } x \in T. \\ x \in S \cap T \Rightarrow x \in S \ \& \ x \in T \\ x \notin S \cup T \Rightarrow x \notin S \ \& \ x \notin T. \\ x \notin S \cap T \Rightarrow x \notin S \text{ or } x \notin T \end{array}\right\}$$

** **Def^n (6):-** A non-empty set Δ is said to be an index set for the family $\mathcal{J} = \{S_\lambda\}$ of sets if for each $\lambda \in \Delta$, $\exists$ a set S_λ in the family $\mathcal{J}$.
For example: $N = \{1,2,3,4,\ldots\}$ is an index set for the family of sets $\{S_1, S_2, S_3, S_4, \ldots\}$.
Consider an arbitrary family of sets $\{S_\lambda : \lambda \in \Delta\}$; Δ is any index set;

** **Def^n (7):** The union of the sets $\{S_\lambda\}$ is defined as

$$\bigcup_{\lambda \in \Delta} S_\lambda = \{x : x \in S_\lambda \text{ for } \cancel{\text{each}} \text{ some } \lambda \in \Delta\}$$