Chapter 1

Sets

Addition theorem:

1. For two sets A and B.

$$n(A\cup B)=n(A)+n(B)-n(A\cap B).$$

2. $$n\left(A^c\cap B^c\right)=n(S)-n(A\cup B).$$

3. For three sets A, B, C,

$$n(A\cup B\cup C)=n(A)+n(B)+n(C)-n(A\cap B)-n(B\cap C)-n(C\cap A)+n(A\cap B\cap C)$$

4. $$n\left(A^c\cap B^c\cap C^c\right)=n(S)-n(A\cup B\cup C).$$

Disjoint sets:

Two sets A and B are said to be disjoint.

If $A\cap B=\phi$

Ex. If A = {1, 2, 3}; B = {p, q} then $A\cap B=\phi$; A, B are disjoint sets.

Symmetric difference of two sets:

If A and B are two sets then (A – B) ∪ (B – A) is called the Symmetric difference of A and B.

It is denoted by $A\,\Delta\,B$, read as A delta B.

$$A\,\Delta\,B=(A-B)\cup(B-A)$$

$$=\{x:x\in A \text{ or } B \text{ but } x\notin A\cap B\}$$

Note:

1. $$A\,\Delta\,B=(A-B)\cup(B-A)$$

2. $$A\,\Delta\,A=\phi$$

3. $A \Delta \phi = \Delta$

4. $A \Delta B = \phi \Rightarrow A = B$