

$$\textcircled{i} \quad n(A \cup B) = n(A) + n(B) - n(A \cap B) \quad \text{— Always true}$$

$$\textcircled{ii} \quad n(A - B) + n(A \cap B) = n(A)$$

$$\textcircled{iii} \quad n(B - A) + n(A \cap B) = n(B)$$

$$\textcircled{iv} \quad n(A - B) + n(A \cap B) + n(B - A) = n(A \cup B)$$

$$\textcircled{v} \quad \text{If } A \cap B = \phi \text{ then } n(A \cup B) = n(A) + n(B)$$

Ques - If A and B are two sets such that $n(A) = 27$, $n(B) = 35$ and $n(A \cup B) = 50$ Find $n(A \cap B)$

$$50 = 27 + 35 - n(A \cap B)$$

$$n(A \cap B) = 62 - 50$$

$$n(A \cap B) = 12$$

Ques - In group of 50 people, 35 speaks hindi, 25 speaks both english and hindi and all people speak at least one of the two languages. How many people speak only hindi and not english? How many speak english?

$$n(H) = 35$$

$$n(E) = ?$$

$$n(H \cap E) = 25$$

$$n(E - H) = ?$$

$$n(H \cup E) = 50$$

$$50 = 35 + n(E) - 25$$

$$\boxed{40 = n(E)}$$

$$n(E-H) + n(E \cap H) = n(E)$$

$$n(E-H) + 25 = 40$$

$$\boxed{n(E-H) = 15}$$

Ans - A computer company must hire twenty programmers to handle system programming jobs and thirty programmers for applications programming. Of these hired, 5 are expected to perform job of both types. How many programmers must be hired?

$$n(S) = 20$$

$$n(A) = 30$$

$$n(S \cap A) = 5$$

$$n(S \cup A) = 20 + 30 - 5$$

$$= 50 - 5$$

$$n(S \cup A) = 45$$

Ans - In group of 60 people, 40 speak hindi, 20 speak both english and hindi and all people speak at least one of the two languages. How many people speak only english not hindi? How many speak english?

$$n(H) = 40, n(E \cap H) = 20, n(E \cup H) = 60, n(E-H) = ?$$

$$60 = 40 + n(E) - 20$$

$$\boxed{40 = n(E)}$$

$$n(E-H) + 20 = 40$$

$$\boxed{n(E-H) = 20}$$

Assignment - maths

- ① In a class of 25 students, 12 have taken maths, 8 have taken maths but not bio. Find the no. of students who have taken maths and biology and those who taken bio but not maths?
- ② A survey shows that 73% of the Indians like apples whereas 65% like oranges. What % of Indians like both apples and oranges?
- ③ In a group of 52 persons, 16 drink tea but not coffee and 33 drink tea.
- i - How many drink tea and coffee both?
 - ii - How many drink coffee but not tea?
- ④ If $A = \{a, b\}$, $B = \{2, 3, 5, 6, 7\}$ and $C = \{5, 6, 7, 8, 9\}$ and find $A \times (B \cap C)$?
- ⑤ Let $A = \{1, 2, 3, 4\}$ determine whether the relation are reflexive, symmetric and antisymmetric or transitive?
- i - $R = \{(1, 2), (1, 3), (1, 4), (2, 3), (2, 4), (3, 4)\}$
 - ii - $R = \{(1, 3), (4, 2), (2, 4), (3, 1), (2, 2)\}$
 - iii - $R = \{(1, 2), (1, 3), (3, 1), (1, 1), (3, 3), (3, 2), (1, 4), (4, 2), (3, 4)\}$