Sets Ex 1.8 Q5(i)

$n(A) = 20,\ n(A \cup B) = 42$ and $n(A \cap B) = 4,$ to find: $n(B)$

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

$$\Rightarrow \quad 42 = 20 + n(B) - 4$$
$$\Rightarrow \quad 42 = 16 + n(B)$$
$$\Rightarrow \quad n(B) = 42 - 16$$
$$= 26$$

$\therefore \quad n(B) = 26$

Sets Ex 1.8 Q5(ii)

To find: $n(A - B)$

We know that if A and B are disjoint sets, then

$$A \cap B = \phi$$
$$\therefore \quad n(A \cup B) = n(A) + n(B) - n(A \cap B)$$
$$= n(A) + n(B) - n(\phi)$$
$$\Rightarrow \quad n(A \cup B) = n(A) + n(B) \qquad [\because n(\phi) = 0]$$

Now,

$$A = (A - B) \cup (A \cap B)$$

i.e A is the disjoint union of $A - B$ and $A \cap B$

$$\therefore \quad n(A) = n(A - B) \cup (A \cap B)$$
$$= n(A - B) + n(A \cap B) \qquad [\because A - B \text{ and } A \cap B \text{ are disjoint}]$$
$$\Rightarrow \quad 20 = n(A - B) + 4$$
$$\Rightarrow \quad n(A - B) = 20 - 4$$
$$= 16$$

$\therefore \quad n(A - B) = 16$

Sets Ex 1.8 Q5(iii)

To find: $B - A$

On a similar lines we have B is the disjoint union of $B - A$ and $A \cap B$

i.e $B = (B - A) \cup (A \cap B)$

$$\therefore \quad n(B) = n(B - A) + n(A \cap B)$$
$$\Rightarrow \quad 26 = n(B - A) + 4 \qquad [\text{using (i)}]$$
$$\Rightarrow \quad n(B - A) = 26 - 4$$
$$= 22$$

$\therefore \quad n(B - A) = 22$

Sets Ex 1.8 Q6

Let $n(P)$ denote the total percentage of Indians $n(O)$ denotes the percentage of Indians who like oranges, and $n(B)$ denotes the percentage of Indians who like bananas.

Then, $n(P) = 100$, $n(O) = 76$ and $n(B) = 62$

To find: $n(O \cap B)$

Now,

$$n(P) = n(O) + n(B) - n(O \cap B)$$

$$\Rightarrow \quad 100 = 76 + 62 - n(O \cap B)$$

$$\Rightarrow \quad 100 = 138 - n(O \cap B)$$

$$\Rightarrow \quad n(O \cap B) = 138 - 100$$

$$= 38$$

$\therefore$ 38% of Indians like both oranges and bananas.

*********** END **********