

## EXERCISE 10(E)

### Question 1.

Write the cardinal number of each of the following sets :

- (i)  $A = \{0, 1, 2, 4\}$
- (ii)  $B = \{-3, -1, 1, 3, 5, 7\}$
- (iii)  $C = \{ \}$
- (iv)  $D = \{3, 2, 2, 1, 3, 1, 2\}$
- (v)  $E = \{\text{Natural numbers between 15 and 20}\}$
- (vi)  $F = \{\text{Whole numbers from 8 to 14}\}$ .

### Solution:

- (i)  $A = \{0, 1, 2, 4\}$  i.e.  $n(A) = 4$
- (ii)  $B = \{-3, -1, 1, 3, 5, 7\}$  i.e.  $n(B) = 6$
- (iii)  $C = \{ \}$  i.e.  $n(C) = 0$
- (iv)  $D = \{3, 2, 2, 1, 3, 1, 2\} \Rightarrow D = \{3, 2, 1\}$  i.e.  $n(D) = 3$
- (v)  $E = \{16, 17, 18, 19\}$  i.e.  $n(E) = 4$
- (vi)  $F = \{8, 9, 10, 11, 12, 13, 14\}$  i.e.  $n(F) = 7$

### Question 2.

Given:

- (i)  $A = \{\text{Natural numbers less than 10}\}$
- $B = \{\text{Letters of the word 'PUPPET'}\}$
- $C = \{\text{Squares of first four whole numbers}\}$
- $D = \{\text{Odd numbers divisible by 2}\}$ . Find:

- (i)  $n(A)$       (ii)  $n(B)$       (iii)  $n(C)$
- (iv)  $n(D)$       (v)  $A \cup B$  and  $n(A \cup B)$
- (vi)  $A \cap C$  and  $n(A \cap C)$
- (vii)  $n(B \cup D)$       (viii)  $n(C \cap D)$
- (ix)  $n(B \cup C)$       (x)  $n(A \cup D)$ .

### Solution:

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Here,

$$A = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$$

$$B = \{P, U, E, T\}$$

$$C = \{0, 1, 4, 9\}$$

$$D = \{ \} \text{ or } \phi$$

$$(i) n(A) = 9 \quad (ii) n(B) = 4$$

$$(iii) n(C) = 4 \quad (iv) n(D) = 0$$

$$(v) A \cap B = \{1, 2, 3, 4, 5, 6, 7, 8, 9, P, U, E, T\}.$$

$$\text{and } n(A \cup B) = 13.$$

$$(vi) A \cap C = \{1, 4, 9\}$$

$$\text{and } n(A \cap C) = 3$$

$$(vii) B \cup D = \{P, U, E, T\}$$

$$\therefore n(B \cup D) = 4$$

$$(viii) C \cap D = \{ \}$$

$$\therefore n(C \cap D) = 0$$

$$(ix) B \cup C = \{P, U, E, T, 0, 1, 4, 9\}$$

$$\therefore n(B \cup C) = 8$$

$$(x) A \cup D = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$$

$$n(A \cup D) = 9.$$

### Question 3.

State true or false for each of the following. Correct the wrong statement.

(i) If  $A = \{0\}$ , then  $n(A) = 0$ .

(ii)  $n(\phi) = 1$ .

(iii) If  $T = \{a, l, a, h, b, d, h\}$ , then  $n(T) = 5$ .

(iv) If  $B = \{1, 5, 51, 15, 5, l\}$ , then  $n(B) = 6$ .

**Solution:**

(i)  $A = \{0\}$  then  $n(A) = 0$  which is false.

True statement is  $n(A) = 1$

(ii)  $n(\phi) = 1$ , which is false.

i.e.  $n(\phi) = 0$

(iii)  $T = \{a, l, a, h, b, d, h\}$  i.e.  $T = \{a, l, h, b, d\}$

i.e.  $n(T) = 5$  which is true.

(iv)  $B = \{1, 5, 51, 15, 5, l\}$   $n(B) = 6$  which is false.

i.e.  $B = \{1, 5, 51, 15\} \Rightarrow n(B) = 4$

