

## Ex-6 (D)

$$1) \text{ i) } A = \{x : x \in \mathbb{N} \text{ and } 3 < x < 6\}$$
$$= \{4, 5, 6\}$$

$$B = \{x : x \in \mathbb{W} \text{ and } x < 4\}$$
$$= \{0, 1, 2, 3\}$$

ii) Set A and B in ascending form  $A = \{4, 5, 6\}$  and  $B = \{0, 1, 2, 3\}$

$$\text{iii) } A \cup B = \{0, 1, 2, 3, 4, 5, 6\}$$

$$\text{iv) } A \cap B = \emptyset$$

$$\text{v) } A - B = \{4, 5, 6\}$$

$$\text{vi) } B - A = \{0, 1, 2, 3\}$$

$$2) \text{ P} = \{x : x \in \mathbb{W} \text{ and } 4 \leq x \leq 8\}$$
$$= \{4, 5, 6, 7, 8\}$$

$$Q = \{x : x \in \mathbb{N} \text{ and } x < 6\}$$
$$= \{1, 2, 3, 4, 5\}$$

$$\text{i) } P \cup Q = \{1, 2, 3, 4, 5, 6, 7, 8\}$$

$$P \cap Q = \{4, 5\}$$

ii)  $f_s(P \cup Q) \supseteq (P \cap Q)$ ?

Yes, all the elements of set  $P \cup Q$  are contained in the set  $P \cap Q$ . Therefore  $P \cup Q$  is a proper subset of  $P \cap Q$ .

3)  $A = \{5, 6, 7, 8, 9\}$

$$B = \{x : 3 < x < 8\}$$

$$= \{4, 5, 6, 7\}$$

$$C = \{x : x \leq 5 \text{ and } x \in \mathbb{N}\}$$

$$= \{1, 2, 3, 4, 5\}$$

i)  $A \cup B = \{4, 5, 6, 7, 8, 9\}$

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

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

ii)  $B \cup C = \{1, 2, 3, 4, 5, 6, 7\}$

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

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

iii)  $A \cap B = \{5, 6, 7\}$

$$(A \cap B) \cap C = \{5, 6, 7\} \cap \{1, 2, 3, 4, 5\}$$

$$= \{5\}$$

iv)  $B \cap C = \{4, 5\}$

$$A \cap (B \cap C) = \{5, 6, 7, 8, 9\} \cap \{4, 5\}$$

$$= \{5\}$$

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$$v) (A \cup B) \cap C = A \cup (B \cap C)$$

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

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

Yes they are equal

$$vi) (A \cap B) \cap C = A \cap (B \cap C)$$

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

$$= \{5\} = \{5\}$$

Yes they are equal.