

6.

$$P = \{x : -1 \leq x \leq 1\}$$

$$Q = \{x : -3 < x \leq 1\}$$

$$S = \{x : 0 \leq x \leq 2\}$$

$$T = \{x : x > 0\}$$

$$(d) (P \cup Q) \cup S$$

$$= (\{x : -1 \leq x \leq 1\} \cup \{x : -3 < x < 1\}) \cup S$$

$$= \{x : -3 < x \leq 1\} \cup \{x : 0 \leq x \leq 2\}$$

$$= \{x : -3 < x \leq 2\}$$

$$(e) T \cap (Q \cup S)$$

$$= T \cap (\{x : -3 < x \leq 1\} \cup \{x : 0 \leq x \leq 2\})$$

$$= T \cap (\{x : -3 < x \leq 2\})$$

$$= \{x : x > 0\} \cap \{x : -3 < x \leq 2\}$$

$$= \{x : 0 < x \leq 2\}$$

$$(h) (T \cap Q) \cup (T \cap S)$$

$$= (\{x : x > 0\} \cap \{x : -3 < x \leq 1\}) \cup (\{x : x > 0\} \cap \{x : 0 \leq x \leq 2\})$$

$$= \{x : -3 < x \leq 1\} \cup \{x : 0 \leq x \leq 2\}$$

$$= \{x : -3 < x \leq 2\}$$

3.  $\Omega$  = set of all students at this university  
 $F$  = the set of all female students  
 $C$  = the set of all students who study computing  
 $S$  = the set of all students who study stat.

- i)  $\bar{F}$  = The set of all students who are not female
- ii)  $M \cap \bar{C}$  = The set of male students who do not study computing
- iii)  $F \cap (C \cup S)$  = The set of female students who study either computing or stat.

b)

i)  $F \cap (S \cap C)$

ii)  $M \cap (S \cup C)$

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i.)  $C \cup (A \cap B)$

or

$$C \cup ((A \cap B) - c)$$

ii)  $(C A - B)^{'}$

iii)  ~~$(A \cap B)^{'}$~~

$$(C A - B)^{'} \cup (B - A)^{'}$$

iv)  $(A \cup C) - B$

$$7) \quad n(SS) = 21 \quad n(HM) = 26$$

$$n(NS) = 19$$

$$n(NS \cap SS) = 7$$

$$\cancel{n(S)}$$

$$n(NS \cap SS \cap HM) = 3$$

$$n(SS \cap HM) = 9$$

$$n(NS \cap HM) = 10$$

$$n(NS \cup HM \cup SS) = 7$$

$$n(NS \cap SS)_o = 7 - 7 = 0 = n(NS \cap SS) - n(NS \cap SS \cap HM)$$

$$n(SS \cap HM)_o = 9 - 7 = 2 = n(SS \cap HM) - n(NS \cap SS \cap HM)$$

$$n(NS \cap HM)_o = 10 - 7 = 3 = n(NS \cap HM) - n(NS \cap SS \cap HM)$$

$$n(SS_{only}) = n(SS) - n(NS \cap SS)_o - n(SS \cap HM)_o$$

$$- n(NS \cap SS \cap HM)$$

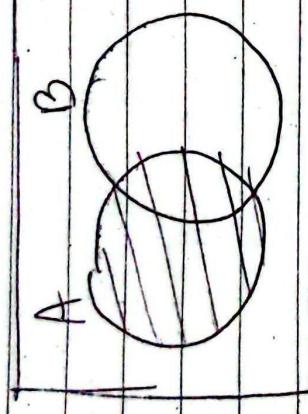
$$= 21 - 0 - 2 - 3$$

$$= 16$$

8) Asking union value

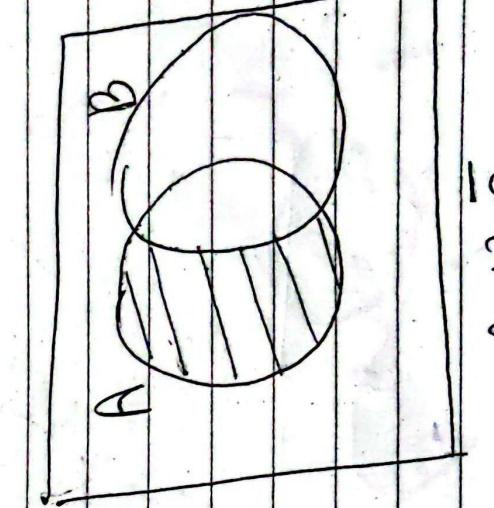
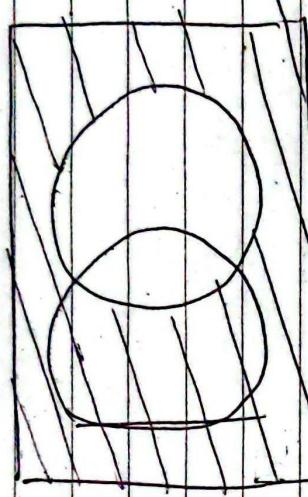
$$C \cup G \cup B = ??$$

5.a)  $A \cup \bar{B}$

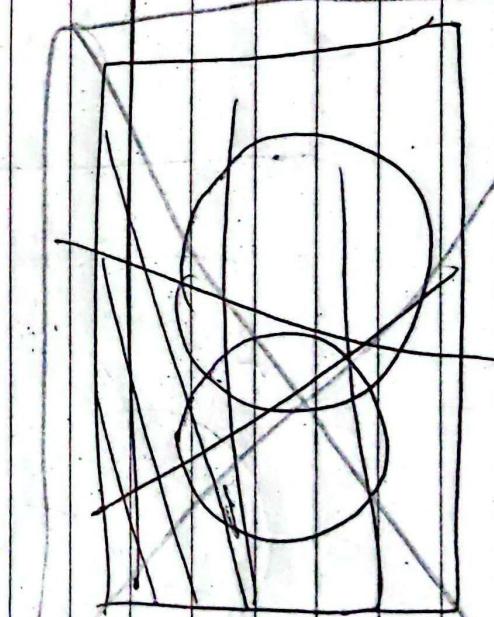


$\bar{B}$

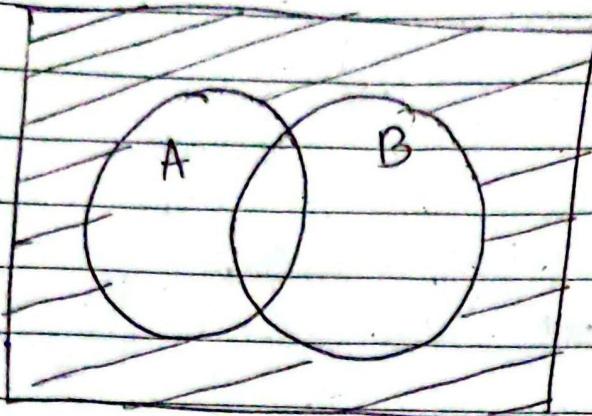
A



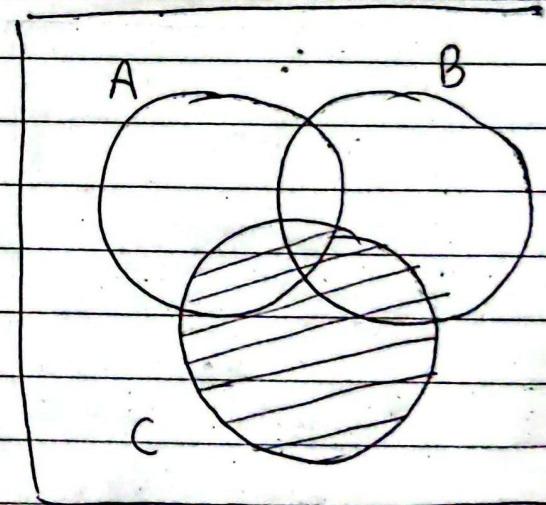
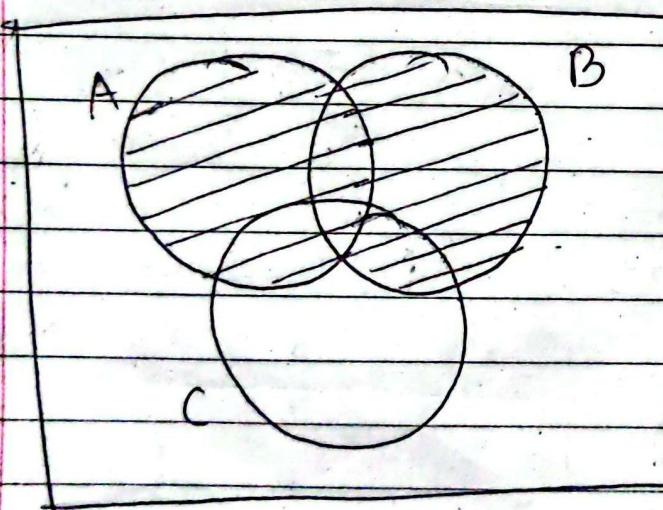
$A \cup \bar{B}$



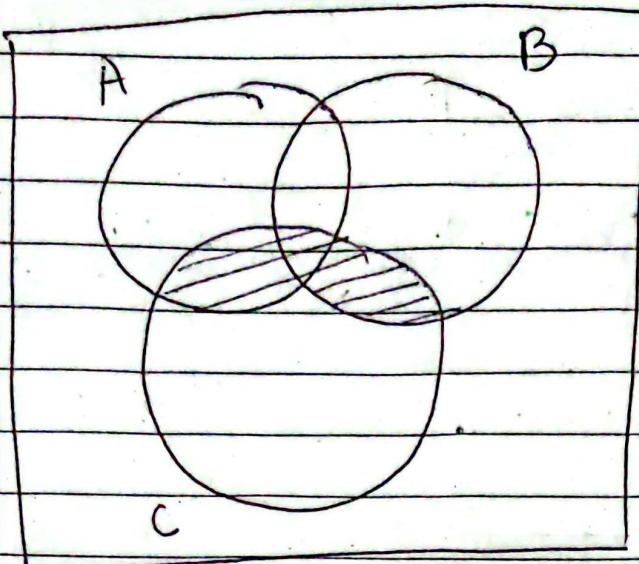
b)  $\overline{A \cup B}$



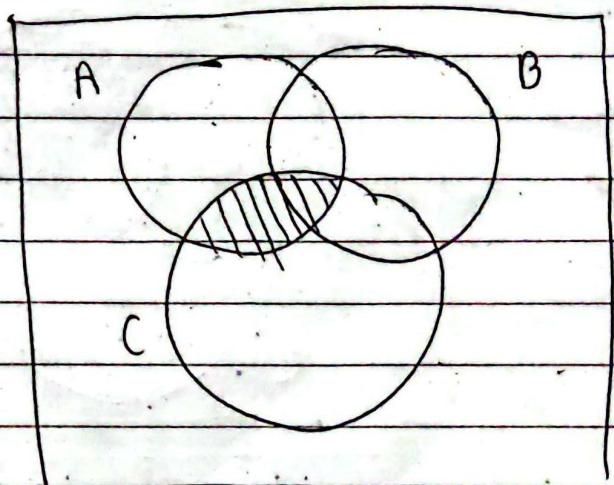
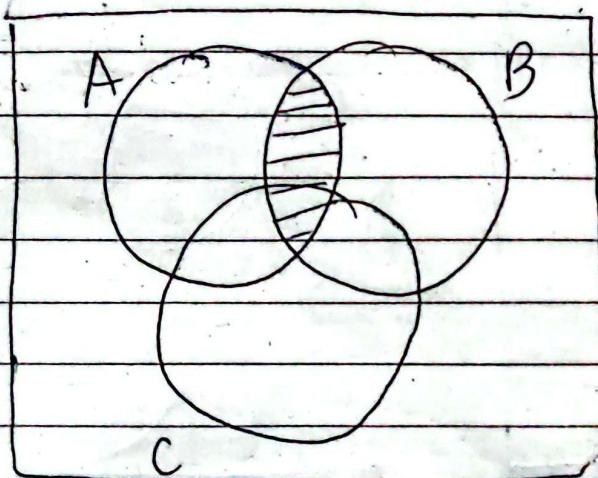
d)  $(A \cup B) \cap C$



$(A \cup B)$

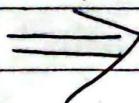


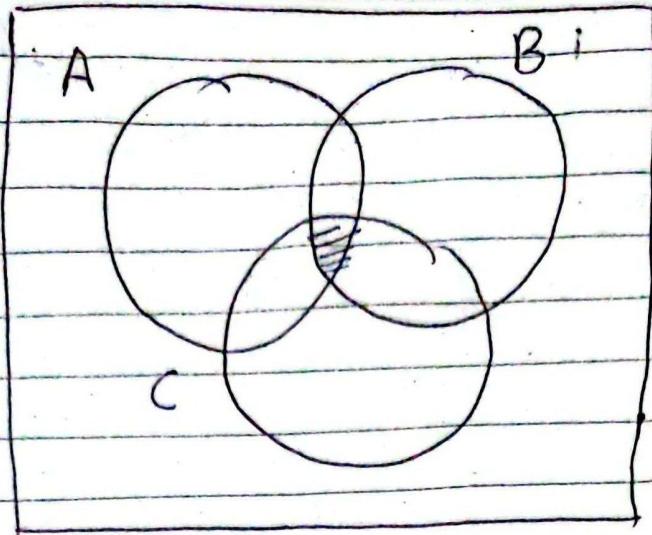
$$f) (A \cap B) \cup (A \cap C)$$



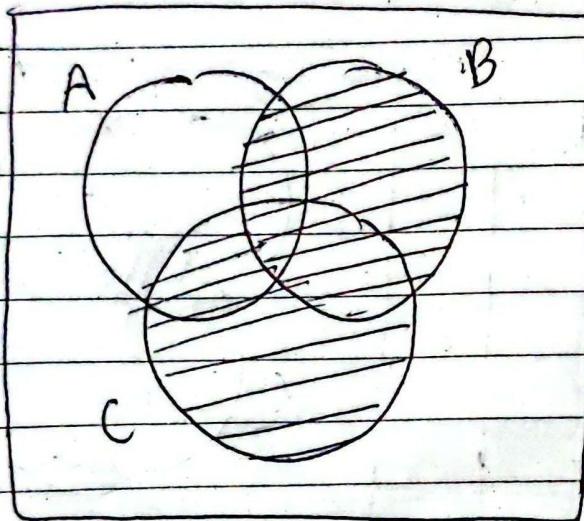
$$(A \cap B)$$

$$A \cap C$$

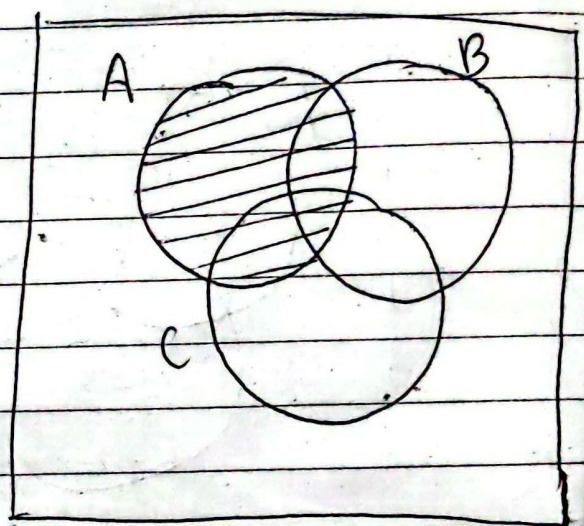




$$(g) (A \cap (B \cup C)) \cap C$$

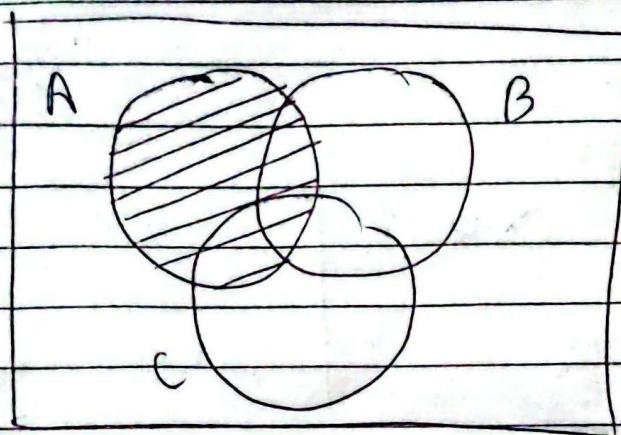
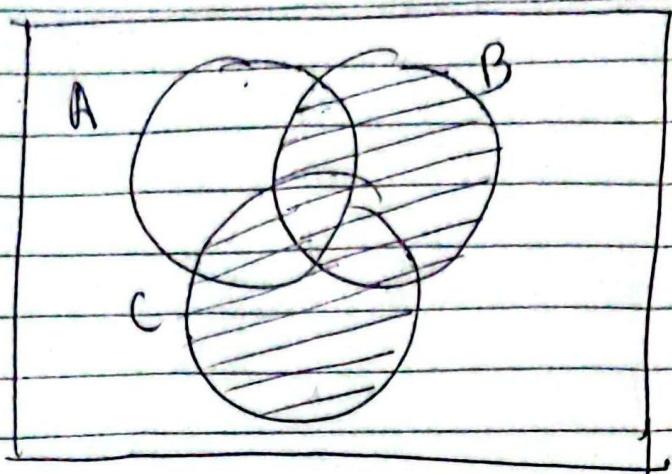


$$(B \cup C)$$

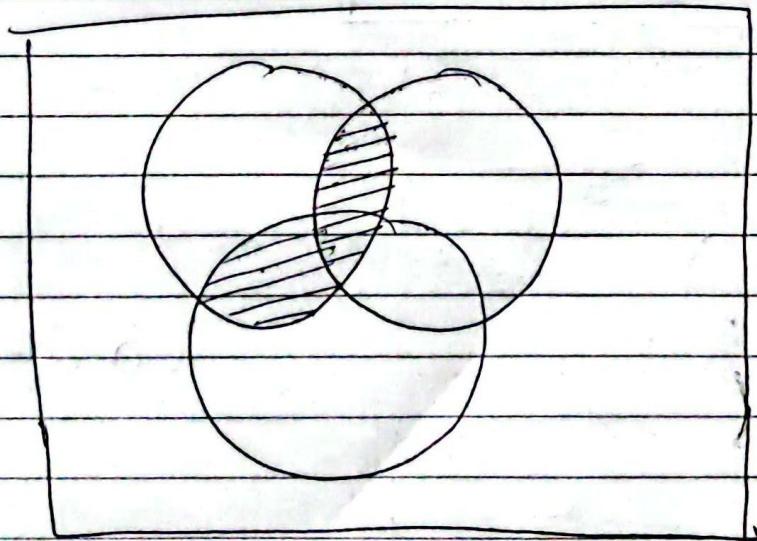


$$A$$

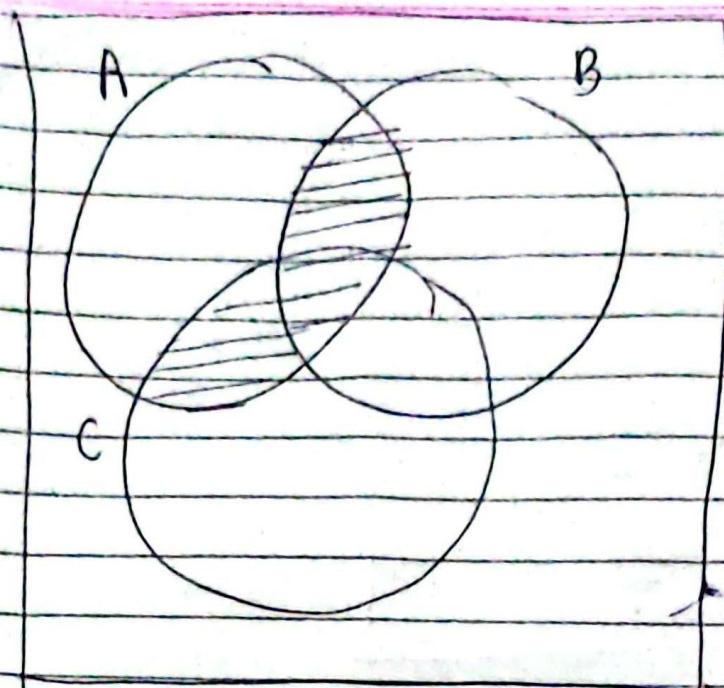
h)  $A \cap (B \cup C)$



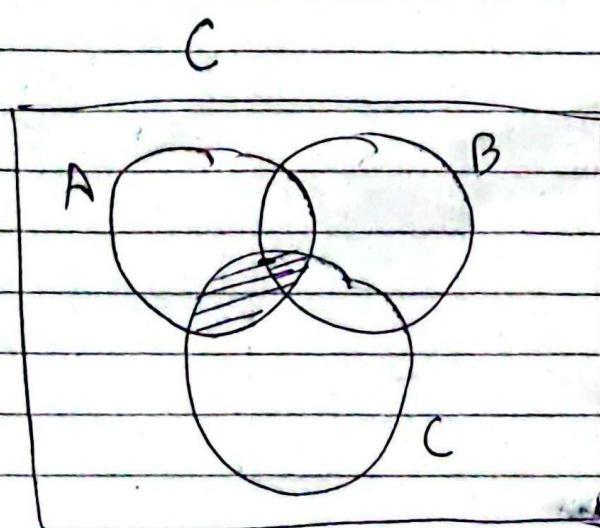
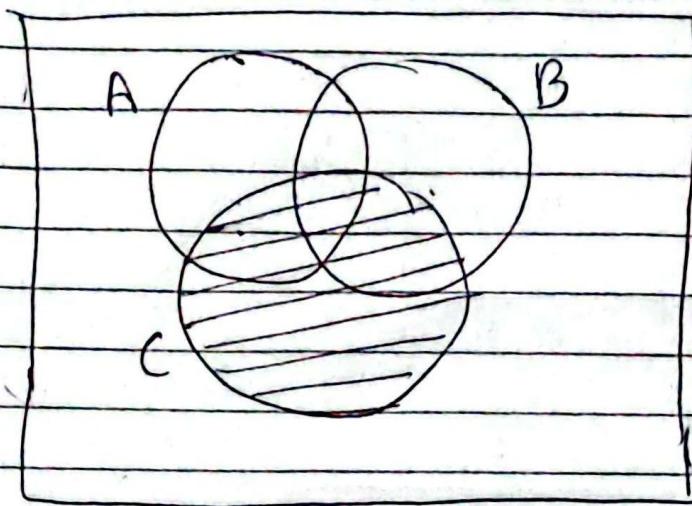
A



$A \cap (B \cup C)$



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



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