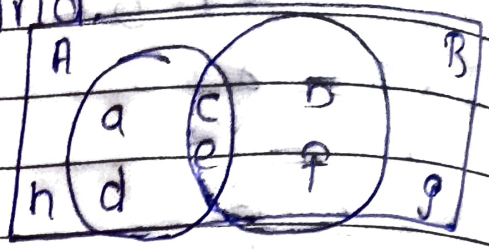
EXERCISE 6 (E)

Q1.) From the given diagram Find:

(i) $A \cup B$ (ii) $A \cap B$
(iii) $A - B$ (iv) $B - A$
(v) $(A \cup B)'$



Ans:-> (i) $A \cup B = \{a, c, d, e\} \cup \{b, c, e, f\}$

$\Rightarrow A \cup B = \{a, b, c, d, e, f\}$

(ii) $A = \{b, f, g, h\}$

$A \cap B = \{b, f, g, h\} \cap \{b, c, e, f\}$

$\Rightarrow A \cap B = \{b, f\}$

(iii) $A - B = \{a, c, d, e\} - \{b, c, e, f\}$

$\Rightarrow A - B = \{a, d\}$

(iv) $B - A = \{b, c, e, f\} - \{a, c, d, e\}$

$= \{b, f\}$

(v) $A \cup B = \{a, b, c, d, e, f\}$

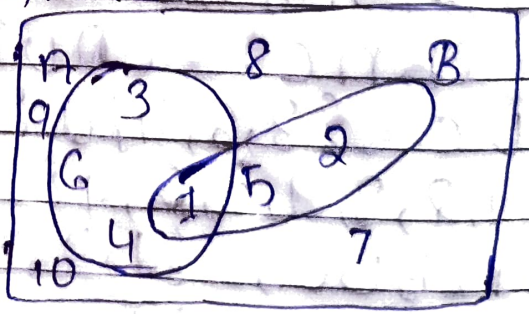
$\therefore (A \cup B)' = \{h, g\}$

Q2.) From the given diagram, Find:

(i) A
(ii) B
(iii) 'A ∪ B'
(iv) $(A \cap B)'$

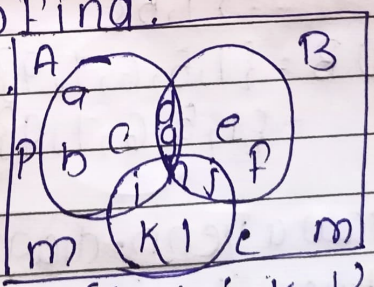
Is $A \cup B = (A \cap B)'$?

Also verify if $A \cap B = (A \cup B)'$



1-> (i) A = {1,3,4,6}
A = {2,5,7,8,9,10}
B = {1,2,5}
B = {3,4,6,7,8,9,10}
A ∪ B = {2,5,7,8,9,10} ∪ {3,4,6,7,8,9,10}
= {2,3,4,5,6,7,8,9,10}
A ∩ B = {1,3,4,6} ∩ {1,2,5}
= {1}
(A ∩ B) = {2,3,4,5,6,7,8,9,10}
From part (iii) and part (iv) we conclude
A ∪ B = (A ∩ B)
NOW A ∩ B = {2,5,7,8,9,10} ∩ {3,4,6,7,8,9,10}
A ∩ B = {7,8,9,10}
NOW A ∪ B = {1,3,4,6} ∪ {1,2,5}
= {1,2,3,4,5,6}
(A ∪ B) = {7,8,9,10}
From I and II we conclude
A ∩ B = (A ∪ B)

Use the given diagram to find:
A ∪ (B ∩ C)
B - (A - C)
A - B (iv) A ∩ B
IS A ∩ B = A - B?



-xi) B ∩ C = {d,e,f,g,h} ∩ {h,i,j,k,l}
= {h,j}
A ∪ (B ∩ C) = {a,b,c,d,g,h,i} ∪ {h,j}
= {a,b,c,d,g,h,i,j}
A - C = {a,b,c,d,g,h,i} - {h,i,j,k,l}
= {a,b,c,d,g}
B - (A - C) = {d,e,f,g,h,j} - {a,b,c,d,g}
= {e,f,h,j}

(iii) $A - B = \{a, b, c, d, g, h, i\} - \{d, e, f, g, h, i\}$

$\Rightarrow A - B = \{a, b, c, i\}$

(iv) $B = \{a, b, c, i, k, l, m, n, p\}$

$A \cap B = \{a, b, c, d, g, h, i\} \cap \{a, b, c, i, k, l, m, n, p\}$

$\Rightarrow A \cap B = \{a, b, c, i\}$

From I and II we can conclude $A \cap B = A - B$

Q4) use the given venn diagram to find:

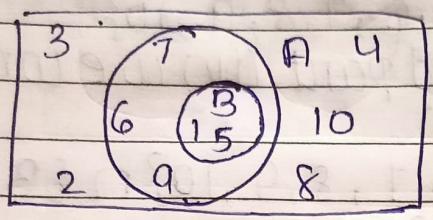
(i) B-A

(ii) A

(iii) B

(iv) $A \cap B$

(v) $A \cup B$



Ans -> (i) $B - A = \{1, 5\} - \{1, 5, 6, 7, 9\}$

$= \{\}$

(ii) $A = \{1, 5, 6, 7, 9\}$

(iii) $B = \{1, 5\}$

$\therefore B = \{2, 3, 4, 6, 7, 8, 9, 10\}$

(iv) $A \cap B = \{1, 5, 6, 7, 9\} \cap \{1, 5\}$

$= \{1, 5\}$

(v) $A \cup B = \{1, 5, 6, 7, 9\} \cup \{1, 5\}$

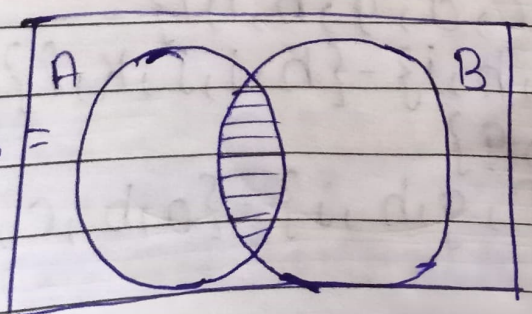
$= \{1, 5, 6, 7, 9\}$

Q5) Draw a venn-diagram to show the relationship between two overlapping sets A and B. Now shade the region representing:

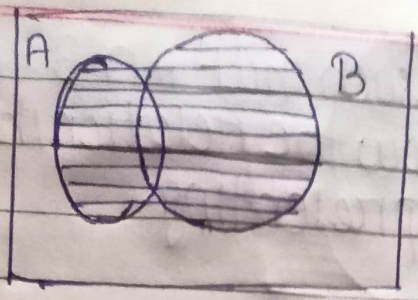
(i) $A \cap B$ (ii) $A \cup B$

(iii) $B - A$

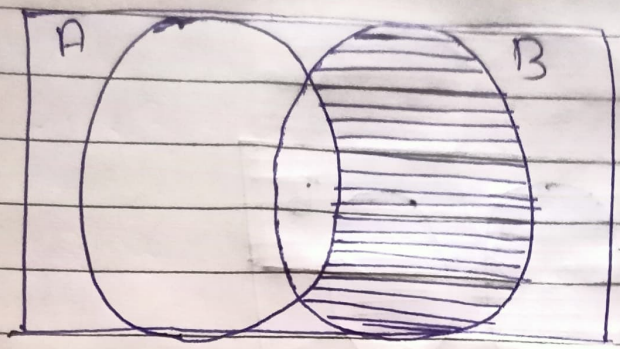
Ans (i) $A \cap B =$



(ii) $A \cup B$ =



(iii) $B - A$ =

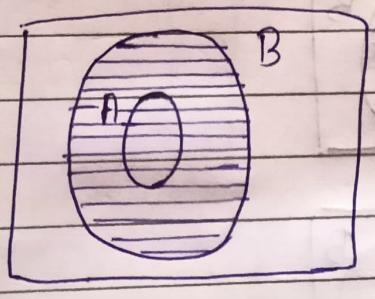


Q6) Draw a venn diagram to show the relationship between two sets A and B; such that $A \subset B$, now shade the region representing:

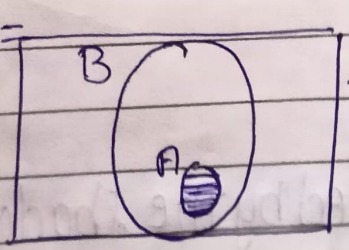
(i) $A \cup B$ (ii) $B \cap A$

(iii) $A \cap B$ (iv) $(A \cup B)$

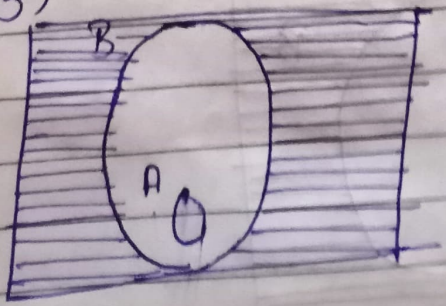
Ans -> $A \cup B$ =



(ii) $B \cap A$ =



(iv) $(A \cup B)$



Sets A and B are such that $A \cap B = \emptyset$. Draw a venn-diagram to show the relationship between A & B. Shade the region representing:

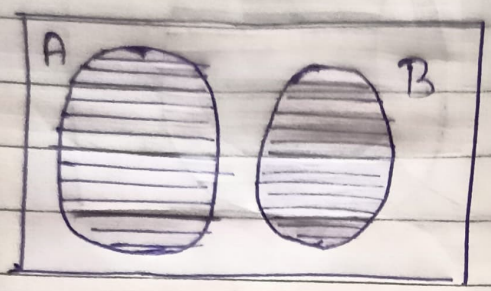
$A \cup B$

$(A \cup B)'$

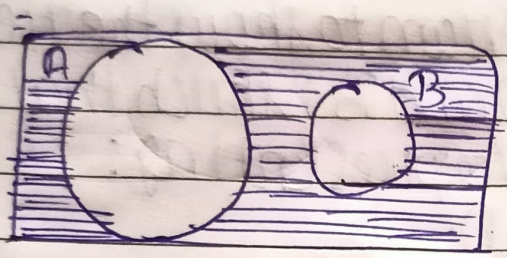
$B - A$

$B \cap A$

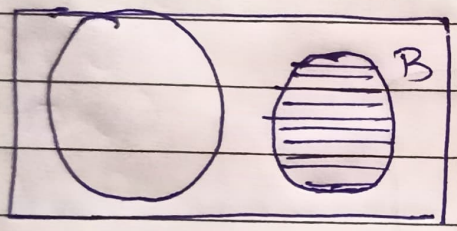
→ $A \cup B$ =



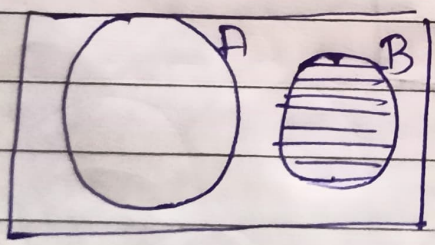
$(A \cup B)'$ =



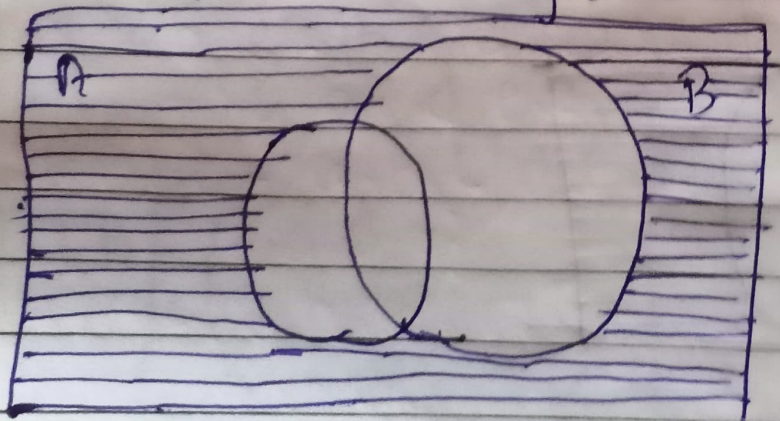
$B - A$ =



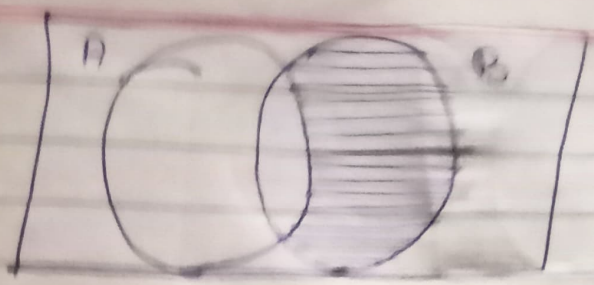
$B \cap A$ =



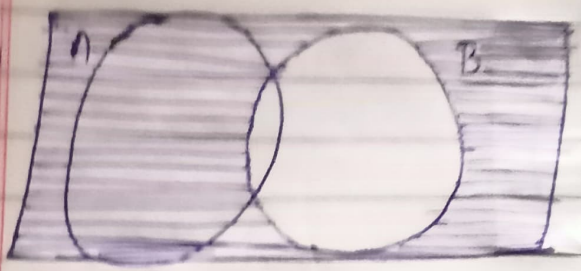
→ State the sets represented by the shaded portion of following venn-diagrams:



Ans: (ii)



(iii)



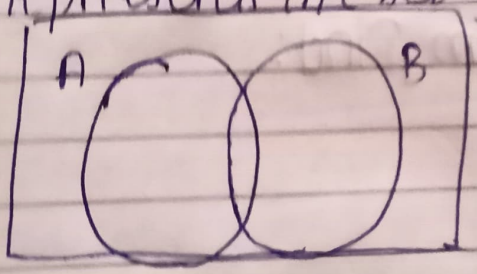
(i) $(A \cup B)$

(ii) $B - A$ or $A \cap B$

(iii) $(B - A)$

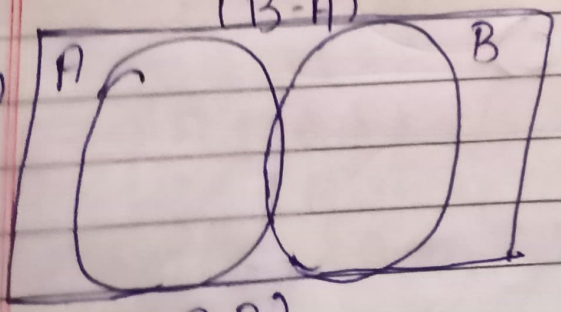
Q9) In each of the given diagram shade the region which represents the set given underneath the diagram.

(i)



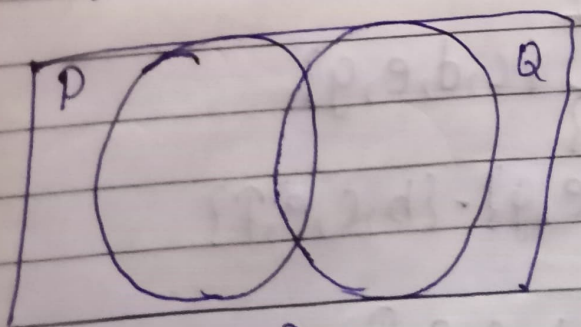
$(B - A)$

(ii)



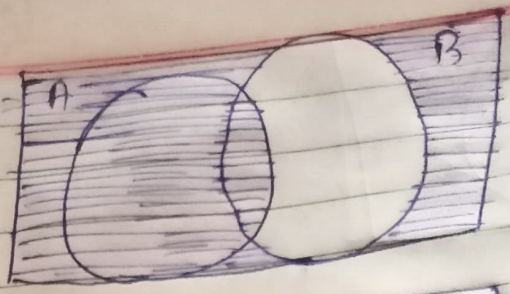
$(A \cap B)$

(iii)

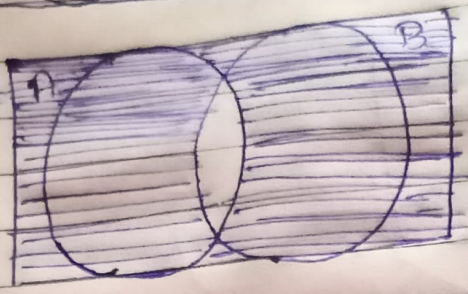


$(P \cup Q)$

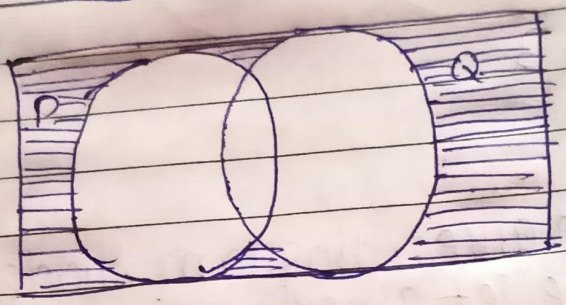
(i) $(B-A)$ =



(ii) $(A \cap B)$ =



(iii) $(P \cup Q)$ =



Q10.) From the given diagram, Find:

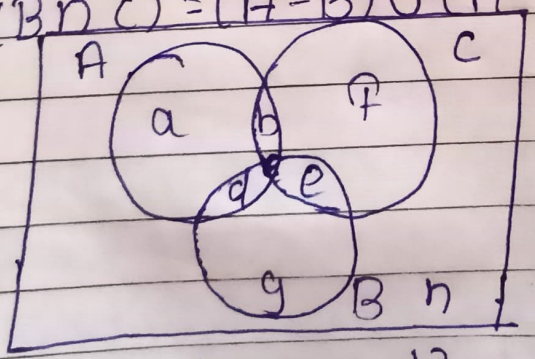
(i) $(A \cup B) - C$

(ii) $B - (A \cap C)$

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

Verify:

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



Ans-> (i) $A \cup B = \{a, b, c, d\} \cup \{c, d, e, g\}$

$= \{a, b, c, d, e, g\}$

$\therefore (A \cup B) - C = \{a, b, c, d, e, g\} - \{b, c, e, f\}$

$= \{a, d, g\}$

(ii) $A \cap C = \{a, b, c, d\} \cap \{b, c, e, f\}$

$= \{b, c\}$

$\therefore B-(A\cap C)=\{c,d,e,g\}-\{b,c\}$

$=\{d,e,g\}$

(iii) $B\cap C=\{c,e,dg\}\cap\{b,c,e,f\}$

$=\{c,e\}$

Q.ii) Using the given diagram express the following sets in the term of A and B.

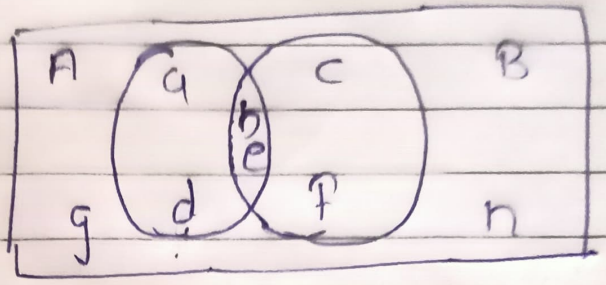
(i) $\{a,d\}$

(ii) $\{a,d,c,f\}$

(iii) $\{a,d,c,f,g,h\}$

(iv) $\{a,d,g,h\}$

(v) $\{g,h\}$



Ans→(i) $\{a,d\}=\{a,b,e,d\}-\{b,c,e,f\}$

$=A-B$

(ii) $\{a,d,c,f\}=(A\cup B)-\{b,e\}$

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

$\{a,d,c,f\}=(A-B)\cup(B-A)$

(iii) $\{a,d,c,f,g,h\}=(A\cap B)$

$[\because \{b,e\}=A\cap B\therefore (A\cap B)=\{a,d,c,f,g,h\}]$

(iv) $\{a,d,g,h\}=B$

$[\because \{b,c,e,f\}=B\therefore B'=\{a,d,g,h\}]$

(v) $\{g,h\}=(A\cup B)$