

Model Answers for InClass Exercises

(a) Let the universal set be \mathbb{N} ,

$A = \{x \in \mathbb{N} \mid x \text{ is even and } 1 < x < 10\}$, $B = \{x \in \mathbb{N} \mid x \text{ is odd and } 3 < x < 9\}$ and $C = \{x \in \mathbb{N} \mid x \text{ is odd and } 2 < x < 8\}$. Find the elements of:

1. $A \cup (B \cap C)$
2. $A \cup (B - C)$
3. $(B \cap \sim A) \cap (A \Delta C)$

Answers:

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

(b) Let the universal set $U = \{1,2,3,4,5,6,7,8,9,10\}$, $A = \{x \in \mathbb{Z} \mid x \text{ is even and } 1 < x < 10\}$,
 $B = \{x \in \mathbb{Z} \mid x \text{ is even and } 3 < x < 7\}$ and $C = \{x \in \mathbb{Z} \mid x \text{ is odd and } 5 < x < 8\}$. Find the characteristic vector of:

1. $\sim(\sim A \cap \sim B) \cup (C \cap A)$
2. $C \Delta (A - B)$
3. $(\sim(\sim A \cap \sim B) \cup (C \cap A)) \cap (C \Delta (A - B))$

Answer:

1. $\{0,1,0,1,0,1,0,1,0,0\}$
2. $\{0,1,0,0,0,0,1,1,0,0\}$
3. $\{0,1,0,0,0,0,0,1,0,0\}$