Sets Ex 1.6 Q2(iv)

iv. $A = \{1, 2, 4, 5\}, B = \{2, 3, 5, 6\}, C = \{4, 5, 6, 7\}$

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

$A - (B \cup C) = \{1\} \ldots\ldots\ldots (1)$

$(A - B) = \{1, 4\}$

$(A - C) = \{1, 2\}$

$(A - B) \cap (A - C) = \{1\} \ldots\ldots\ldots\ldots (2)$

From eq^n (1) and eq^n (2), we get

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

Sets Ex 1.6 Q2(v)

v. $A = \{1, 2, 4, 5\}, B = \{2, 3, 5, 6\}, C = \{4, 5, 6, 7\}$

$B \cap C = \{5, 6\}$

$A - (B \cap C) = \{1, 2, 4\} \ldots\ldots\ldots (1)$

$(A - B) = \{1, 4\}$

$(A - C) = \{1, 2\}$

$(A - B) \cup (A - C) = \{1, 2, 4\} \ldots\ldots\ldots\ldots (2)$

From eq^n (1) and eq^n (2), we get

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

Sets Ex 1.6 Q2(vi)

vi. $A=\{1,2,4,5\}, B=\{2,3,5,6\}, C=\{4,5,6,7\}$

$B\Delta C=(B-C)\cup(C-B)=\{2,3\}\cup\{4,7\}=\{2,3,4,7\}$

$A\cap(B\Delta C)=\{2,4\}\ldots\ldots\ldots(1)$

$(A\cap B)=\{2,5\}$

$(A\cap C)=\{4,5\}$

$(A\cap B)\Delta(A\cap C)=[(A\cap B)-(A\cap C)]\cup[(A\cap C)-(A\cap B)]$

$(A\cap B)\Delta(A\cap C)=\{2\}\cup\{4\}=\{2,4\}\ldots\ldots\ldots\ldots(2)$

From eq^n (1) and eq^n (2), we get

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

Sets Ex 1.6 Q3(i)

$U=\{2,3,5,7,9\}$ is the universal set

$A=\{3,7\}$, $B=\{2,5,7,9\}$

$A\cup B=\{x:x\in A \text{ or } x\in B\}$

$=\{2,3,5,7,9\}$

LHS $=(A\cup B)'$

$=\{2,3,5,7,9\}'$

$=U-A\cup B$

$=\phi$

RHS $=A'\cap B'$

$A'=\{x\in U: x\notin A\}$

$=\{2,5,9\}$

$B'=\{x\in U: x\notin B\}$

$=\{3\}$

$\therefore\ A'\cap B'=\{2,5,9\}\cap\{3\}$

$=\phi$ [$\because$ the two sets are disjoint]

$\therefore$ LHS = RHS Proved

Sets Ex 1.6 Q3(ii)

LHS $=(A\cap B)'$

Now,

$A\cap B=\{x|x\in A \text{ and } x\in B\}$

$=\{7\}$

$\therefore (A\cap B)'=\{7\}'$

$=\{x\in U: x\notin 7\}$

$=\{2,3,5,9\}$

RHS $=A'\cup B'$

Now, $A'=\{2,5,9\}$ [form (i)]

and $B'=\{3\}$ [from (i)]

$\therefore\ A'\cup B'=\{2,3,5,9\}$

Hence, LHS = RHS Proved

********** END **********