Sets Ex 1.7 Q2(iii)

$$\begin{aligned}\text{LHS} &= A \cap (A \cup B')\\ &= A \cap (A' \cap B') && [\text{By De-morgan's law}]\\ &= (A \cap A') \cap B' && [\text{By associative law}]\\ &= \phi \cap B' && [\because A \cap A' = \phi]\\ &= \phi\\ &= \text{RHS}\end{aligned}$$

$\therefore$ LHS = RHS Proved.

Sets Ex 1.7 Q2(iv)

$$\begin{aligned}\text{RHS} &= A \Delta (A \cap B)\\ &= (A - (A \cap B)) \cup (A \cap B - A) && [\because E \Delta F = (E - F) \cup (F - E)]\\ &= (A \cap (A \cap B)') \cup (A \cap B \cap A') && [\because E - F = E \cap F']\\ &= (A \cap (A' \cup B')) \cup (A \cap A' \cap B) && [\text{By De-morgan's law \& associative law}]\\ &= (A \cap A') \cup (A \cap B') \cup (\phi \cap B) && [\because \cap \text{ distributes over } \cup \text{ and } A \cap A' = \phi]\\ &= \phi \cup (A \cap B') \cup \phi && [\because \phi \cap B = \phi]\\ &= A \cap B' && [\because \phi \cup x = x \text{ for any set } x]\\ &= A - B && [\because A \cap B' = A - B]\\ &= \text{LHS}\end{aligned}$$

$\therefore$ LHS = RHS Proved.

Sets Ex 1.7 Q3

We have, ACB

To show: $C - B \subset C - A$

Let, $x \in C - B$

$\Rightarrow \quad x \in C$ and $x \notin B$

$\Rightarrow \quad x \in C$ and $x \notin A$ $\quad [\because A \subset B]$

$\Rightarrow \quad x \in C - A$

Thus, $x \in C - B \Rightarrow x \in C - A$

This is true for all $x \in C - B$

$\therefore \quad C - B \subset C - A$

Sets Ex 1.7 Q4(i)

$$\begin{aligned}\text{i. } (A \cup B) - B &= (A - B) \cup (B - B)\\ &= (A - B) \cup \phi\\ &= A - B\end{aligned}$$

Sets Ex 1.7 Q4(ii)

$$\begin{aligned}\text{ii. } A - (A \cap B) &= (A - A) \cap (A - B)\\ &= \phi \cap (A - B)\\ &= A - B\end{aligned}$$

Sets Ex 1.7 Q4(iii)

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