Problem 1

a) From $\bar{A} \oplus B = C = \{1, 4, 5, 8, 9\}$ and $B = \{5, 6, 8, 9, 10\}$.

$\rightarrow \{5, 8, 9\} \in C, B$ then $\{5, 8, 9\} \notin \bar{A}$

and $\{1, 4\} \in C$ but $\{1, 4\} \notin B$ then $\{1, 4\} \in \bar{A}$

and $\{6, 10\} \in B$ but $\{6, 10\} \notin C$ then $\{6, 10\} \in \bar{A}$

Thus, we have $\bar{A} = \{1, 4, 6, 10\}$

which give $A = \{2, 3, 5, 7, 8, 9\}$

b) $\bigcup_{i=1}^{100} A_i = \{1, 2, 3, 4, \ldots, 99, 100\}$

$\bigcap_{i=1}^{100} A_i = \{1\}$