

### Question 1

If  $A$  is a non-empty subset of TS  $(X, T)$ , then  $T_A = \{(G \cap A) : G \in T\}$ .

### Question 2

Let  $(X, T)$  be a TS and  $A, B, \subseteq X$ , then

- (i)  $\overline{\phi} = \phi, \overline{X} = X$
- (ii)  $A \subseteq B \rightarrow \overline{A} \subseteq \overline{B}$
- (iv)  $\overline{A \cap B} \subseteq \overline{A} \cap \overline{B}$
- (v)  $\overline{A \cup B} = \overline{A} \cup \overline{B}$

### Question 3

Construct three topologies  $T_1, T_2$  and  $T_3$  on  $\{a, b, c\}$  such that  $T_1 \subset T_2 \subset T_3$

### Question 4

Find the mutually non-comparable topologies for the set  $\{a, b, c\}$

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### Question 6

Verify if  $X = \{a, b, c, d, e\}, T = \{X, \phi, \{a\}, \{c, d\}, \{a, c, d\}, \{b, c, d, e\}\}$  is a topology. Find all the closed sets, clopen and n-clopen sets.