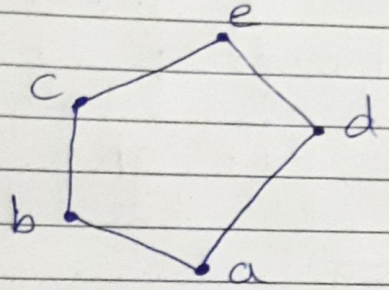
Semester : III Subject : DSGT Academic Year: 2022-2023

## * Chain and Anti-chain -

Let $(A, \leq)$ be a partially ordered set. A subset of A is called a chain if every two elements in the subset are related. The number of elements in a chain is called the length of the chain.

A subset of A is called 'an antichain' if no two distinct elements in the subset are related.

e.g. ① $A = \{a, b, c, d, e\}$

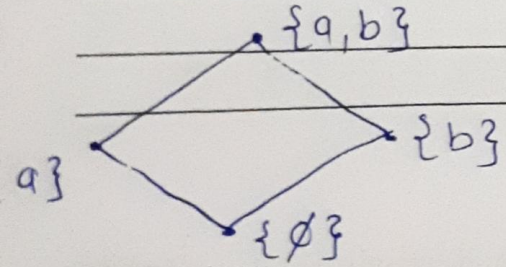



chain = $\{a, b, c, e\}$, $\{a, b, c\}$, $\{a, b\}$ $\{a, d, e\}$ $\{a, d\}$, $\{a\}$

anti-chain = $\{b, d\}$ $\{c, d\}$.

② Let $A = \{a, b\}$ and consider its poset $\{P(A), \subseteq\}$ find chains & anti-chains

⇒ $P(A) = \{\{\phi\}, \{a\}, \{b\}, \{a, b\}\}$




Chains = $\{\{\phi\}, \{a\}, \{a, b\}\}$, $\{\{\phi\}, \{b\}, \{a, b\}\}$, $\{\{\phi\}, \{a\}\}$, $\{\{\phi\}, \{b\}\}$, $\{a\}, \{a, b\}\}$, $\{\{b\}, \{a, b\}$

anti-chain = $\{\{a\}, \{b\}\}$