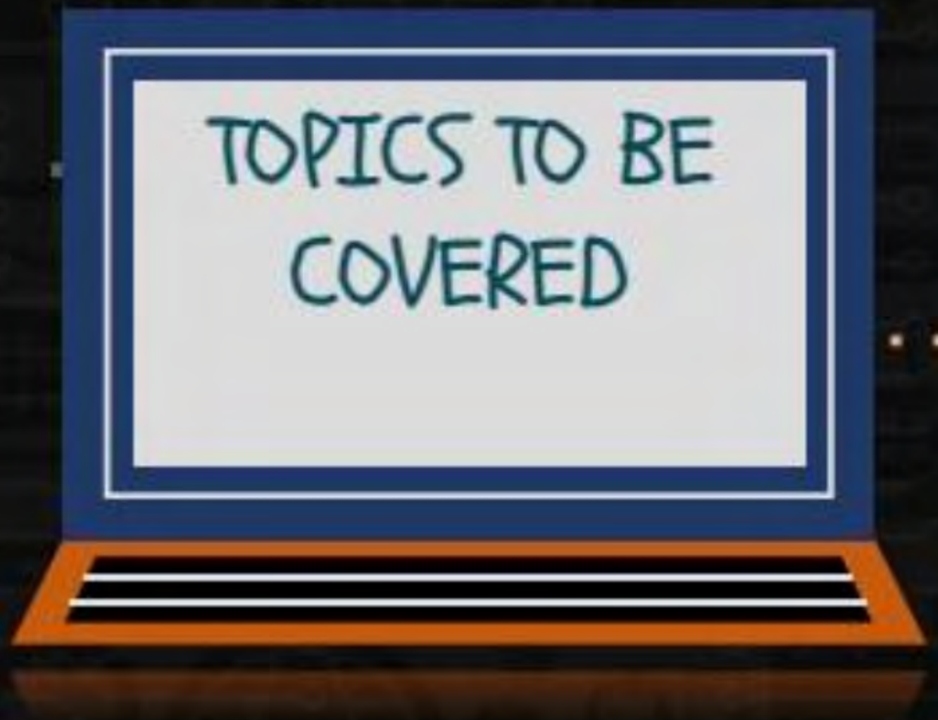
CS & IT ENGINEERING

Theory of Computation

Finite Automata

DPP 13 Discussion Notes

Mallesham Devasane Sir



01 Question

02 Discussion

Q.1

[MCQ]

Consider the following statements:

S_1: Kleene Closure (*) of infinite set is always finite.

S_2: Kleene Closure (*) of finite set is always infinite.

Which of the following is correct?

$(Inf)^* \Rightarrow$ Infinite

$(Fin)^* \Rightarrow$?

A. S_1 only.

B. S_2 only.

C. Both S_1 and S_2 are correct.

D. None of these.

Q.2

Consider a language L, then subset of L will be?

[MCQ]

A. Regular.

B. Regular but finite.

C. Non-regular.

D. None of these.

Subset of L ⇒ may be fin
" " Inf
" " reg
" " non-reg

Q.3 [MSQ]

Consider two languages L_1 and L_2.

$L_1 = a^*b^*$ → reg

$L_2 = b^*a^*$ → reg

$L_1 \cap L_2 = a^* + b^*$

Which of the following is/are correct for above languages.

A. ✓ $L_1 \cup L_2$ is regular.

B. ✗ For $L_1 \cup L_2$ regular expression will be $(a + b)^*$. ✗

C. ✓ $L_1 \cap L_2$ is regular.

D. ✓ For $L_1 \cap L_2$ regular expression will be $(a^* + b^*)$.

Q.4

If subset of L_1 is regular then what is L_1?

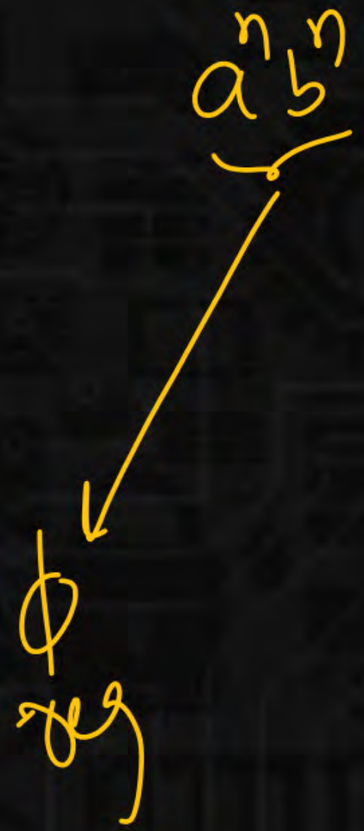
[MCQ]

A. L_1 must be finite.

B. L_1 must be regular.

C. L_1 must be non-regular.

D. None of these.



Q.5

Regular language does not close under on which operation?

[MCQ]

A. Complement

B. Union

C. Subset

D. Intersection

Q.6

[NAT]

Consider the following statements:

[I] If L is regular, then $\bar{L}$ is regular.

[II] If $\bar{L}$ is regular, then L is regular.

[III] Union of L and its complement is Σ^*.

Number of correct statement is/are 3.

$$L \cup \bar{L} = \Sigma^*$$

$$L \cap \bar{L} = \phi$$

Q.7 [MSQ]

Let $L_1 = \{\epsilon\}$

$L_2 = \{a^+\}$

$L_1 \cap L_2 = \phi$

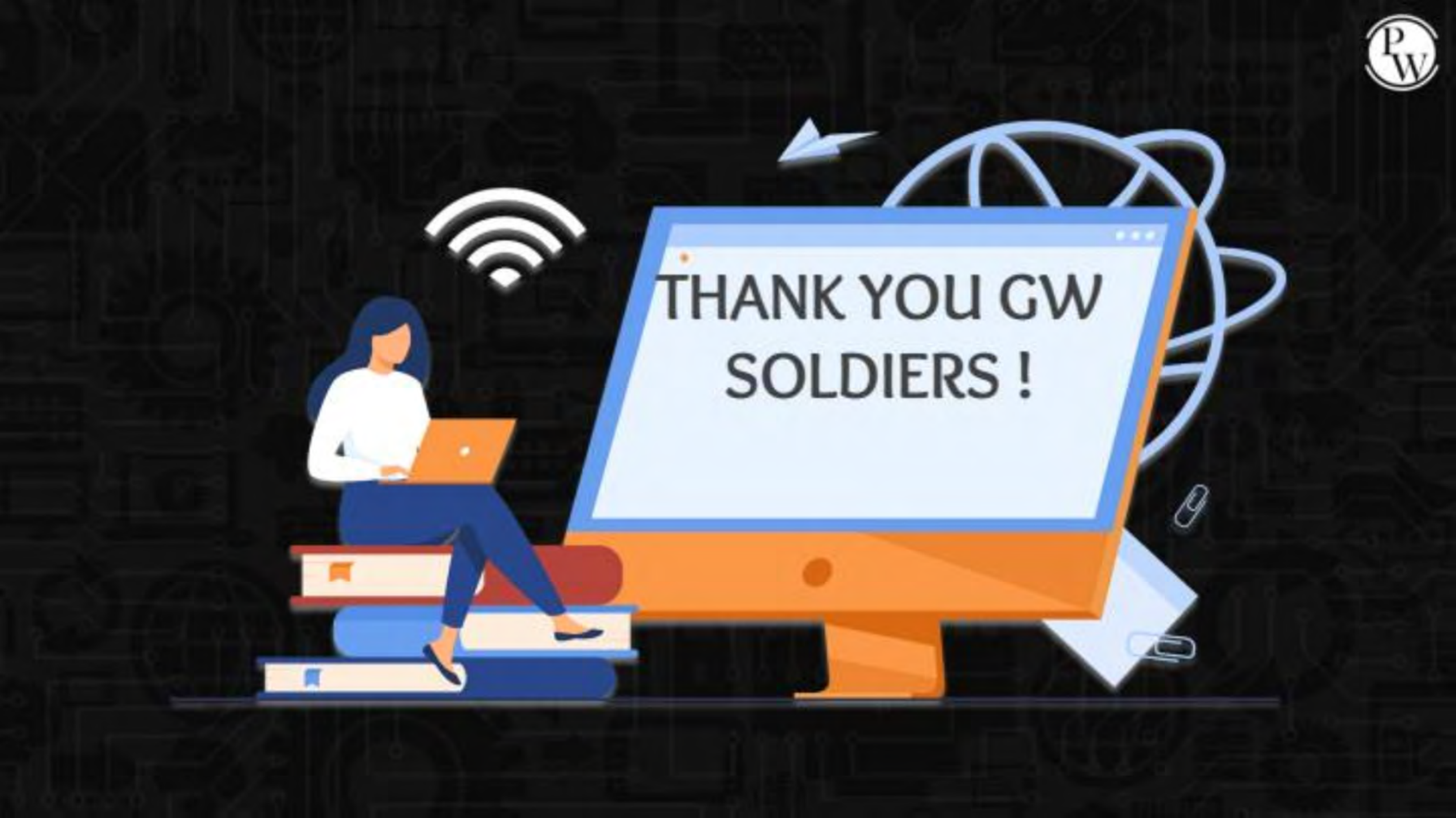
Then which of the following is correct?

A. $L_1 \cap L_2 = \epsilon$. ✗

B. $L_1 \cup L_2$ = any language. ✓ $L_1 \cup L_2 = a^*$

C. $L_1 \cup \overline{L_2} = \epsilon$. ✓

D. None of these.


THANK YOU GW
SOLDIERS !