CS & IT ENGINEERING

Theory of Computation

Push Down Automata

DPP 04 **Discussion** Notes

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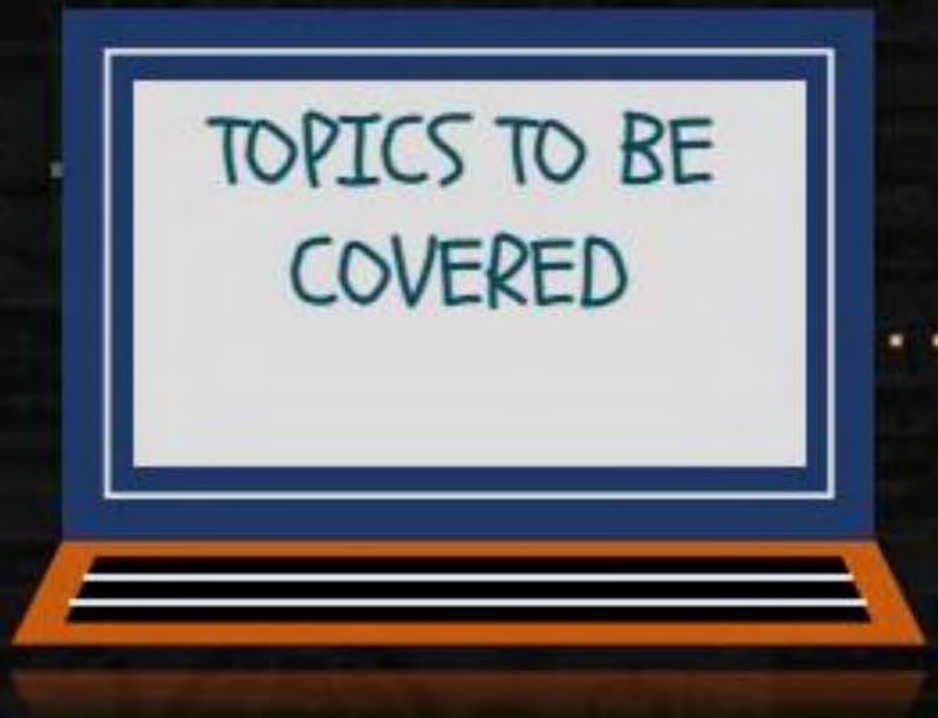


01 Question

02 Discussion

Q.1

Suppose L_1 is a finite language and L_2 is non-regular language then $L_1 \cap L_2$ will be:

[MCQ]

Fin $\cap$ Non-reg $\Rightarrow$ Fin

A. Regular but infinite

B. Non-regular

C. Finite and regular

D. None of these

Q.2

[NAT]

Consider a languages L:

$L = \{a^{29n+9} \mid n \geq 9\}$ then total number of minimum states in DFA will be ____.

$= 271$

$29 \times 9 + 9$

$a^{270} = a^{270}$ (min)

$L = \{a^{270}, a^{299}, \ldots\}$

271 states

Q.3 Consider the languages L = {ab, aa, baa} which of the following strings is/are in L^*.

[MCQ]

$L^* = \{ab, aa, baa\}^*$

A. abaabaaabaa $\in L^*$

B. aaaabaaaa $\in L^*$

C. baaaaabaaaab $\notin L^*$

D. baaaaabaa $\in L^*$

Q.4 [MCQ]

Consider the following statements:

(i) All finite languages are context free languages ✓

(ii) All regular languages are finite. ✗

(iii) All DCFL's are finite. ✗

(iv) All regular languages are DCFL ✓

(v) There exists some language which are finite and ~~irregular~~ not regular. ✗

The number of correct statements from the above statements are = 2.

Q.5

[MCQ]

Consider the following languages.

$L_1 = \{a^n b^n \mid n \geq 0\}$ → DCFL

$L_2 = \{a^n b^m c^k \mid n, m, k \geq 0 \wedge n \neq m \vee m \neq k\}$ → CFL

Which of the following statements is correct?

A. L_1 is CFL and L_2 is DCFL

B. L_1 is DCFL and L_2 is CFL

C. L_1 and L_2 both are DCFL

D. None of these.

Q.6

Which of the following grammar is/are generating DCFL but not regular language?

[MSQ]

A. $S \rightarrow aa\,S\,bb \mid \in$ $\Rightarrow a^{2n}b^{2n}$

B. $S \rightarrow a\,S\,bb \mid \in$ $\Rightarrow a^{n}b^{2n}$

C. $S \rightarrow aa\,S\,b \mid \in$ $\Rightarrow a^{2n}b^{n}$

D. $S \rightarrow abS \mid \in$ $\Rightarrow (ab)^{*}$

Q.7

[MCQ]

Consider the following languages:

$L_1 = \{a^m b^n c^k \mid \text{if } (m = \text{even}) \text{ then } (n = k)\}$ → DCFL

$L_2 = \{a^n c b^n\} \cup \{a^n d b^n\} = a^n(c+d)b^n$ → DCFL

Which of the following is correct statement?

A. Only L_1 is DCFL.

B. Only L_2 is DCFL.

C. Both L_1 and L_2 are CFL but not DCFL

D. Both L_1 and L_2 are DCFL but not regular.

Q.8 [NAT]

Consider the following grammar:

$S \rightarrow AB$

$A \rightarrow aAa \mid bAb \mid \in$ → xx^R

$B \rightarrow aBa \mid bBb \mid \in$ → yy^R

$L = \{xx^R yy^R \mid x, y \in \{a, b\}^*\}$ → CFL

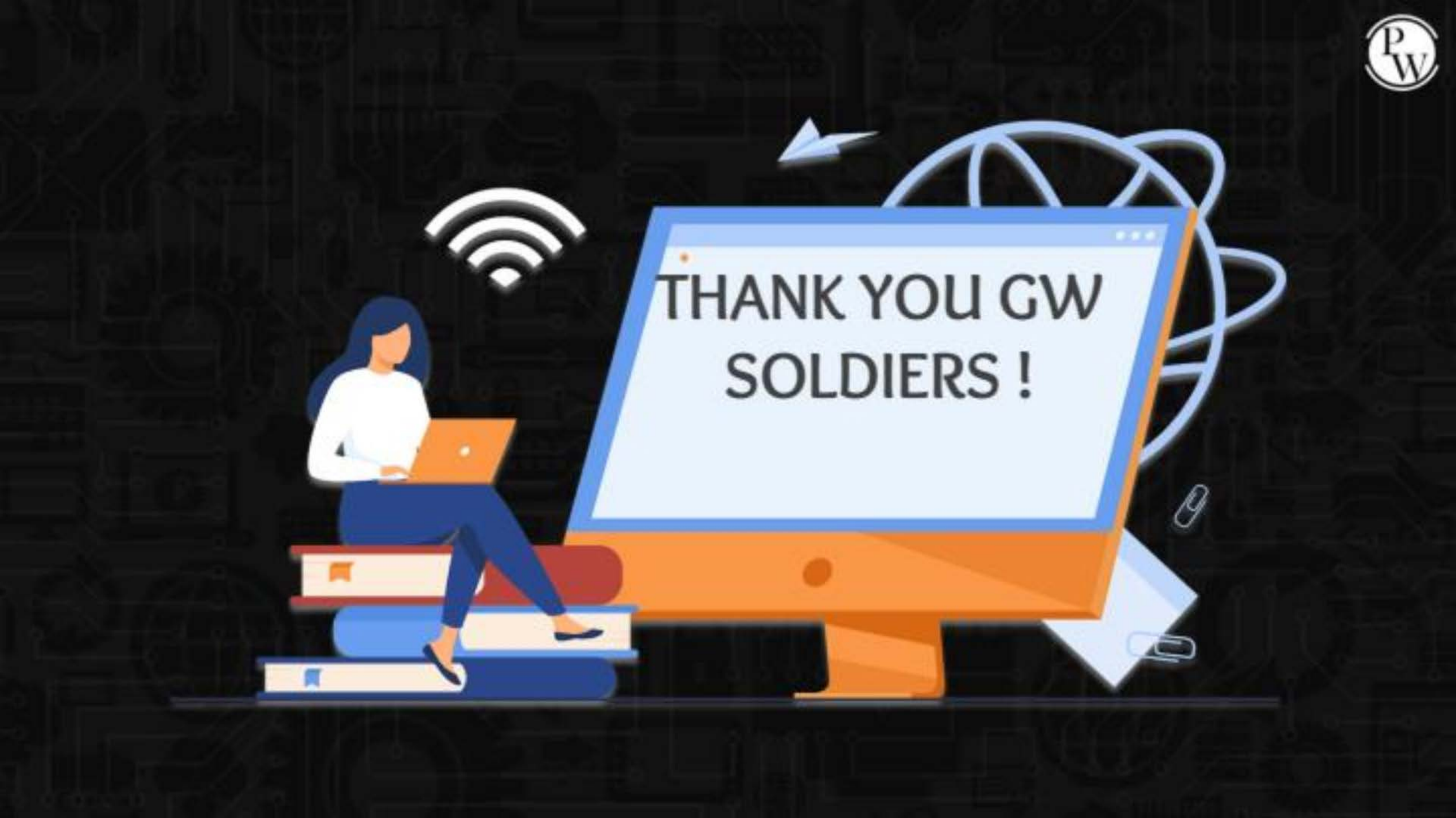
Which of the following is correct regarding above grammar?

A. Language produced by S is $L = \{xx^R yy^R \mid x, y \in \{a, b\}^*\}$ and L is DCFL but not regular.

B. Language produced by S is $L = \{xx^R yy^R \mid x, y \in \{a, b\}^*\}$ and L is CFL but not DCFL.

C. Language produced by S is $L = \{xx^R yy^R \mid x, y \in \{a, b\}^*\}$ and L is DCFL.

D. None of the above.


THANK YOU GW
SOLDIERS !