CS & IT ENGINEERING

Theory of Computation

Finite Automata – NFA

DPP 07 Discussion

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01 Question

02 Discussion

Q.1

Let $L_1 = \phi$, $L_2 = \{\varepsilon\}$, $L_3 = \{a, \varepsilon\}$.

L_1, L_2, L_3 are languages defined over $\Sigma = \{a\}$

then, $L_3.L_2.L_1^* + L_1.L_3$ is____.

[MCQ]

A. ϕ

B. $\{a\}$

C. $\{a, \varepsilon\}$

D. $\{a^n \mid n \geq 2\}$

$(a+\varepsilon).\varepsilon.\phi^* + \phi.(a+\varepsilon)$

ε $\quad$ ϕ

$= a+\varepsilon$

Q.2

Consider the following given grammar

$S \rightarrow AB$

$A \rightarrow AS \mid a$

$B \rightarrow BA \mid SB \mid b$

Which of the following string generated by above grammar?

[MCQ]

A. bbaa

B. baba

C. aabb

D. baab

$S \Rightarrow AB \Rightarrow aB \Rightarrow aSB \Rightarrow aABB \Rightarrow aaBB \Rightarrow aabB \Rightarrow aabb$

Q.3

If the finite automaton M has 100 states and all the states are Non final except initial state over the alphabet $\Sigma = \{0, 1\}$ then the set L(M) can be:

[MCQ]

$\varepsilon \notin L(M)$

A. ϕ

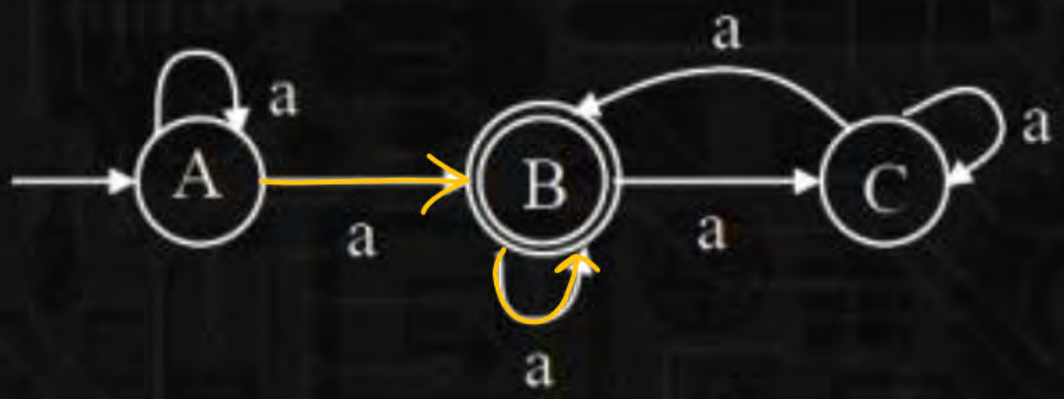
B. Σ^*

C. $\{\varepsilon\}$

D. Subset of Σ^*

Q.4

Consider the following finite automata.



Find the language accepted by above FA? [MCQ]

A. a^*

$aa^* = a^+$

B. aa^*

C. aaa^*

D. $a(aa)^*$

Q.5 Which of the following language does not satisfy the prefix property?

MSQ [MCQ]

A. $L = \{a^n b^n \mid n \geq 1\} = \{ab, a^2b^2, a^3b^3, \ldots\}$ satisfy

B. $L = \{wxw^R \mid x, w \in (0+1)^*\}$ (e.g. aba)

C. $L = \{a^m b^{2m} \mid m \geq 1\} = \{ab^2, a^2b^4, \ldots\}$

D. $L = \{w \in (0+1)^* \mid n_0(w) = n_1(w)\}$

$= \{\varepsilon, 01, 10, 0110, \ldots\}$

$L = \{w_1, w_2, w_3, w_4\}$

It should not be prefix of every other

$L = \{w \mid w \text{ is not prefix to any other string in } L\}$

Q.6

Consider the following left linear Grammar.

$S \rightarrow Sa|Sb|A$

$A \rightarrow Aab|\varepsilon$

$S \rightarrow Sa|Sb|(ab)^*$

$L(A) = (ab)^*$

Choose the correct language generated by the above grammar.

[MCQ]

A. $(a+b)^*$

B. $(a+b)^+$

C. $(a+b)^* ab$

D. $(a+b)^+ ab$

$S(a+b)^* = (ab)^*(a+b)^*$

$= (a+b)^*$

Q.7

Consider a language L = {w | w ∈{a, b}*, 5th symbol from end is 'a'}

If number of state in NFA is P and Number of states in MDFA (minimal DFA) is Q then the value of P * Q is _____. **[NAT]**

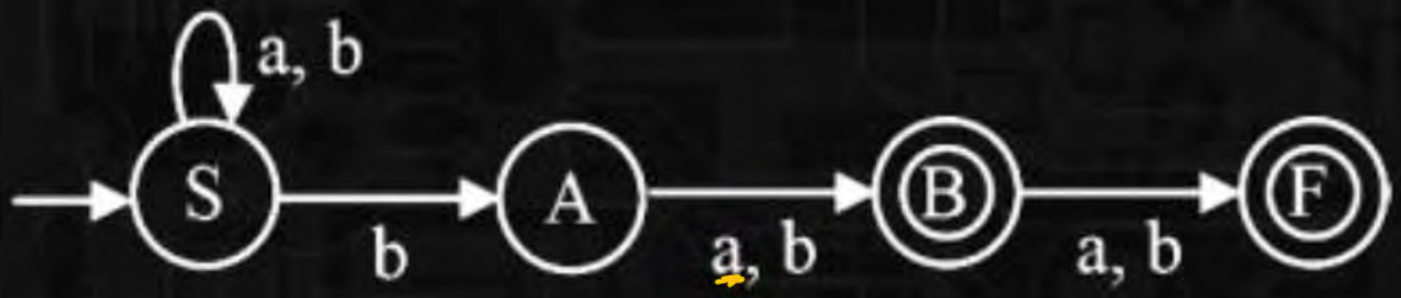
$P = 5+1 = 6$

$Q = 2^5 = 32$

$= 192$

Q.8

Consider the following finite automaton:



Which one of the following is correct representation of above finite automaton? [MCQ]

A. Second symbol from ends is 'b'.

B. Containing (b + ab + ba) as a substring.

C. Third symbol from ends is 'b'

D. None of these.


THANK YOU GW
SOLDIERS !