COMPUTER ENGINEERING DEPARTMENT,
SVNIT, SURAT

Automata and Formal Languages - CS208

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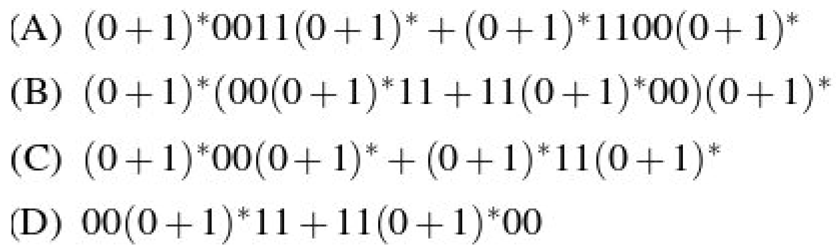
* Required

AFL-Unit Test 1

Which one of the following regular expressions represents the language: the set of all binary strings having two consecutive 0s and two consecutive 1s? *



(A) $(0+1)^*0011(0+1)^*+(0+1)^*1100(0+1)^*$

(B) $(0+1)^*(00(0+1)^*11+11(0+1)^*00)(0+1)^*$

(C) $(0+1)^*00(0+1)^*+(0+1)^*11(0+1)^*$

(D) $00(0+1)^*11+11(0+1)^*00$

○ D

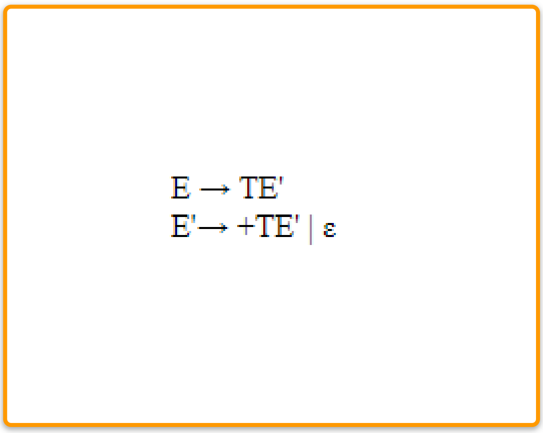
● A

○ C

○ B

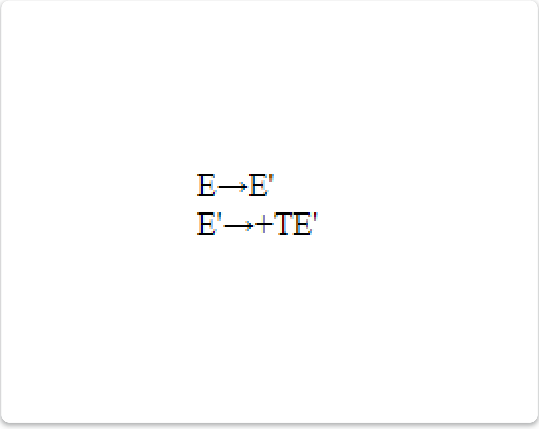
Eliminate left recursion from the grammar: *

$E \rightarrow E+T \mid T$



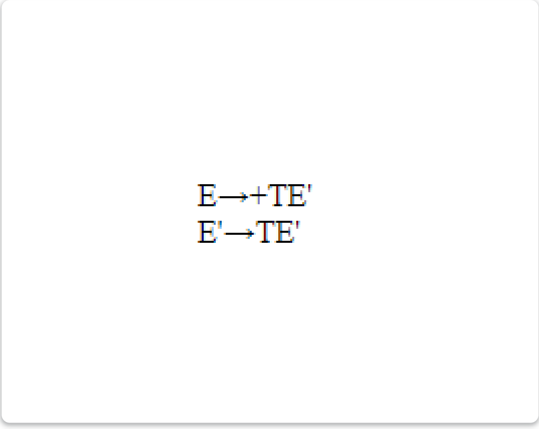
$E \rightarrow TE'$
$E' \rightarrow +TE' \mid \varepsilon$

● Option 1



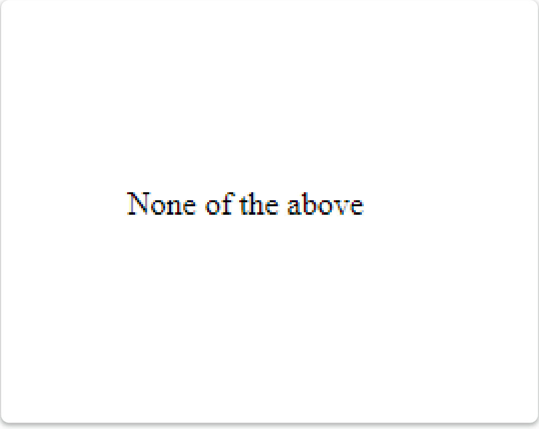
$E \rightarrow E'$
$E' \rightarrow +TE'$

○ Option 2



$E \rightarrow +TE'$
$E' \rightarrow TE'$

○ Option 3



None of the above

○ Option 4

The given grammar is of type *

$Xyz \rightarrow ba$

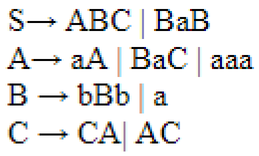
● Type 0 Grammar

○ Type 2 Grammar

○ Type 1 Grammar

○ Type 3 Grammar

Total number of useless symbols in given grammar G is *


S→ ABC | BaB
A→ aA | BaC | aaa
B → bBb | a
C → CA| AC

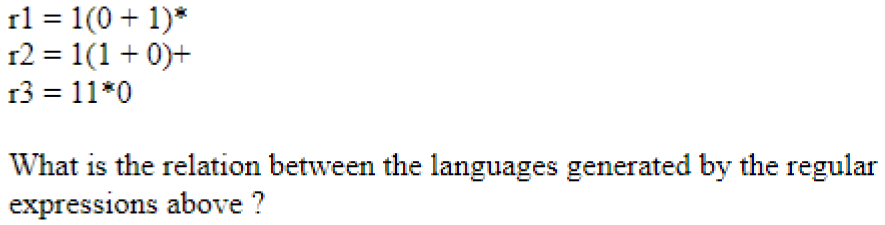
○ 0

● 1

○ 2

○ 3

Consider the Following regular expressions *


$r1 = 1(0 + 1)^*$
$r2 = 1(1 + 0)+$
$r3 = 11^*0$

What is the relation between the languages generated by the regular expressions above ?

○ L (r1) ⊇ L (r2) and L(r2) ⊆ L(r3)

● L (r1) ⊇ L (r2) and L(r2) ⊇ L(r3)

○ L (r1) ⊇ L (r3) and L(r2) ⊆ L(r1)

○ L (r1) ⊆ L (r2) and L(r1) ⊆ L(r3)

Context Free Languages is closed under *

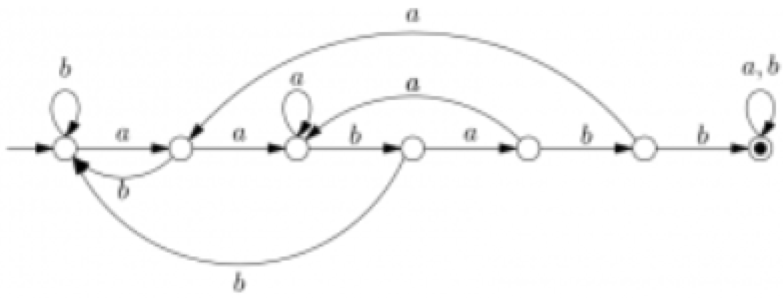
○ Union

○ Concatenation

● Both (a) and (b)

○ None of the above

Consider the following Deterministic Finite Automata and state which statement is true. *



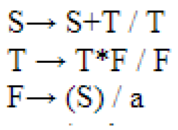
○ It only accepts strings with prefix as "aababb"

○ It only accepts strings with substring as "aababb”

○ It only accepts strings with suffix as "aababb”

● All of the above

How many unit productions are there in following grammar: *



S→ S+T / T
T → T*F / F
F→ (S) / a

○ 1

● 2

○ 3

○ 4

Ambiguity can be removed using *

○ Associativity of Operators

○ Precedence of Operators

○ Separate the Productions

● All of the above

According to the 5-tuple representation i.e. FA= {Q, ∑, δ, q, F} *

Statement 1: q ϵ Q';
Statement 2: FϵQ

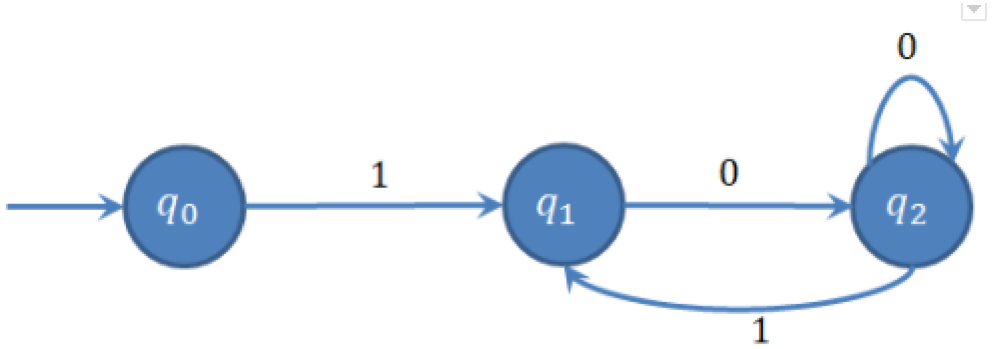
○ Statement 1 is false, Statement 2 is true

○ Statement 1 may be true, Statement 2 is false

● Statement 1 is true, Statement 2 is false

○ Statement 1 is false, Statement 2 may be true

In given automata,qo=initial state and q2=final state .What is δ*(101)? *



○ q2

○ q0

● q1

○ q1,q2

In some programming language, L denotes the set of letters and D denotes the set of digits. An identifier is permitted to be a letter followed by any number of letters or digits. The regular expression that defines an identifier is *

○ (L.D)*

○ (L.D)*

○ (L + D)*

○ L (L.D)

● L (L + D)*

Is the given grammar ambiguous? *

S→ SaSbS | SbSaS | ε

○ Given grammar is not CFG

○ Insufficient Data

○ No

● Yes

Are the given productions in chomsky normal form? *

A→ a | BCD | cd

○ Yes

○ Can't say

○ Given grammar is not CFG

● No

There is moore machine wit m states and n outputs.If we convert this moore machine to mealy machine then maximum number of states possible in mealy machine is: *

● m-1

○ m+1

○ m*n

○ m

Is this production in CFG? *

$SA \rightarrow ab$

○ Insufficient Data

○ Given production is not satisfying the grammar rules.

○ Yes

● No

Consider the context-free grammar and which of the following terminal strings has more than one parse tree when parsed according to the grammar? *

$E \rightarrow E + E$
$E \rightarrow (E * E)$
$E \rightarrow id$

○ ((id * id + id) * id)

● id + id + id + id

○ (id* (id * id)) + id

○ id + (id* (id * id))

Which two of the following four regular expressions are equivalent? (i). (00)* (ε+0) (ii). (00)* (iii). 0* (iv). 0(00)* *

○ (iii) and (iv)

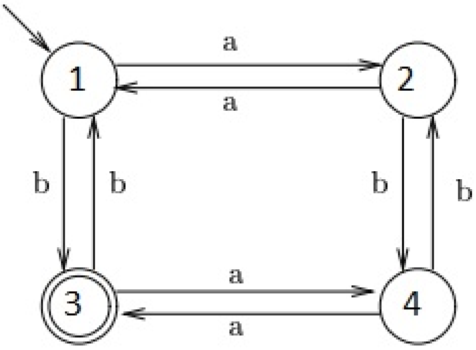
○ (i) and (ii)

● (i) and (iii)

○ (ii) and (iii)

○ (ii) and (iii)

This DFA represents *



○ Set of all strings over {a,b} which contains odd a and odd b

○ Set of all strings over {a,b} which contains even a and even b

○ Set of all strings over {a,b} which contains odd a and even b

● Set of all strings over {a,b} which contains even a and odd b

The language corresponding to the regular expression (0 + 1)*(10) is *

○ Always ends with 0

● Always ends with 10

○ Start with 0

○ All of the above

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