Automata and Formal Languages - CS208

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AFL-Unit Test 2

A PDA chooses the next move based on *   1 point

- ○ Current state
- ○ Next input symbol
- ● Both given option
- ○ None of these

The format: A->aB refers to which of the following? *   1 point

- ○ Chomsky Normal Form
- ● Greibach Normal Form
- ○ Context Free Grammar
- ○ All of these

An instantaneous description of Turing machine consists of *   1 point

○ Present input only

◉ Present state and entire input to be processed

○ None of these

○ Present state and input to be processed

An FSM can be considered a TM. Choose the correct statements *   1 point

○ Of finite tape length, without rewinding capability and bidirectional tape movement

○ Of finite tape lengths rewinding capability and unidirectional tape movement

◉ Of finite tape length, without rewinding capability and unidirectional tape movement

○ Of finite tape length, rewinding capability and bidirectional tape movement

Which of the following does the given NFA represent? *   1 point
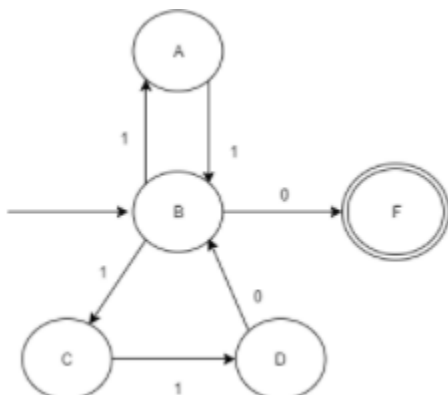
○ {11, 101} * {01}

○ {110, 01} * {11}

◉ {11, 110} * {0}

○ {00, 110} * {1}

Which of the following is correct statement? * 1 point

◉ Moore machine has accepting states

○ Mealy machine has accepting states

○ We can convert Mealy to Moore but not vice versa

○ All of these

If a and b be the regular expressions, then (a* ∪ b*) * is equivalent to * 1 point

○ (b* ∪ a*)*

○ (b ∪ a)*

○ (a ∪ b) *

◉ All of these

Let L={w ∈ (0 + 1)*|w has even number of 1s}, i.e. L is the set of all bit strings 1 point
with even number of 1s. Which one of the regular expression below
represents L? *

○ (0*10*1)*

◉ 0*(10*10*)*

○ 0*(10*1*)*0*

○ 0*1(10*1)*10*

PDA can be represented with the help of * 1 point

○ Instantaneous description

○ Transition diagram

○ Transition table

◉ All of these

A context free grammar G is in Chomsky normal form if every production 1 point
is of the form *

○ A → BC or A → A

◉ A → BC or A → a

○ A → BCa or B → b

○ None of these

Statement 1: A Finite automata can be represented graphically; Statement 1 point
2: The nodes can be its states; Statement 3: The edges or arcs can be used
for transitions Hint: Nodes and Edges are for trees and forests too. Which
of the following make the correct combination? *

○ Statement 1 is false but Statement 2 and 3 are correct

○ Statement 1 and 2 are correct while 3 is wrong

○ None of the mentioned statements are correct

◉ All of the mentioned

Which of the following pairs have DIFFERENT expressive power? *   1 point

○ Deterministic finite automata (DFA) and Non-deterministic finite automata (NFA)

◉ Deterministic push down automata (DPDA)and Non-deterministic push down automata (NPDA)

○ Deterministic single-tape Turing machine and Non-deterministic single-tape Turing machine

○ All of these

The state diagram describes the finite state machine. A is the starting state 1 point
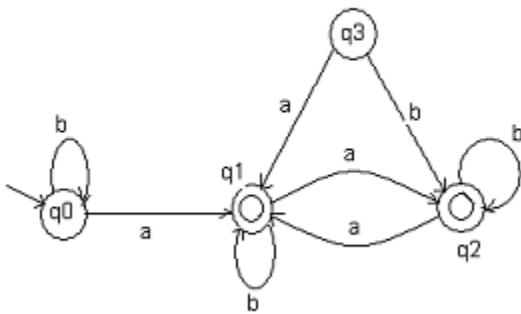and an arc label is x/y where x stands for 1 bit input and y stands for 2 bit
output *

--·
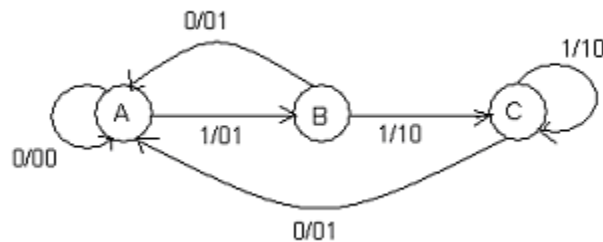
○ Whenever the input sequence is 10 it outputs 00

○ Whenever the input sequence is 11 it outputs 01

◉ It outputs the sum of the present and the previous bits of the input

○ None of these

The figure shown below is a finite state automaton *
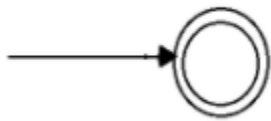
1 point

- ○ 1
- ● 2
- ○ 3
- ○ 4

Which of the following statement is false? *

1 point

- ○ The context free language is accepted by pushdown automata
- ● None of these
- ○ The context free language can be converted into Greibach normal form
- ○ The context free language can be converted into Chomsky normal form

FSM shown in the figure *

1 point

- ○ No String
- ○ All Strings
- ⦿ ε- alone
- ○ All of these

TM is more powerful than FSM because *

1 point

- ○ It has no finite state control
- ○ The tape movement is confined to one direction
- ⦿ It has the capability to remember arbitrary long sequences of input symbols
- ○ All of these

Given an arbitrary non-deterministic finite automaton (NFA) with N states, the maximum number of states in an equivalent minimized DFA is at least *

1 point

- ○ N^2
- ⦿ 2^N
- ○ 2N

○ N!

The minimum number of productions required to produce a language consisting of palindrome strings (even and odd) over {a,b} is *   1 point

○ 3

○ 2

○ 7

⦿ None of these

Which of the following statement is false? *   1 point

○ Let L is a language accepted by a PDA P then there exist a CFG G L such that L(G) =N(P)

⦿ All of these

○ If L is a CFL then there exists a push down automata P accepting CFL L by empty stack i.e. L = N(P)

○ If L is a language accepted by PDA A by final state there exist a PDA B that accepts L by empty stack such that L =L(A) = N(B)

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