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* Required

Name *

Rahil Siddique

Class *

TE COMP C

Roll No *

24

Given the language L = {ab, aa, baa}, which of the following strings are in L*? 1) abaabaaabaa 2) aaaabaaaa 3) baaaaabaaaab 4) baaaaabaa * 2 points

- [ ] 1,2,3
- [x] 1,2,4
- [ ] 1 only
- [ ] 1,3,4

Definition of a language L with alphabet {a} is given as following. L={a^nk| k>0, and n is a positive integer constant} What is the minimum number of states needed in DFA to recognize L? * 2 points

- ○ K+1
- ◉ n+1
- ○ 2^k
- ○ n^k

Let w be any string of length n is {0,1}*. Let L be the set of all substrings of w. What is the minimum number of states in a non-deterministic finite automaton that accepts L? * 2 points

- ○ n-1
- ○ n+2
- ○ n
- ◉ n+1

Which one of the following languages over the alphabet {0,1} is described by the regular expression: (0+1)*0(0+1)*0(0+1)*? * 2 points

- ○ The set of all strings containing the substring 00.
- ○ The set of all strings containing at most two 0's.
- ◉ The set of all strings containing at least two 0's.
- ○ The set of all strings that begin and end with either 0 or 1

Which one of the following is FALSE? * 2 points

- ○ There is unique minimal DFA for every regular language
- ○ Every NFA can be converted to an equivalent PDA.
- ○ Complement of every context-free language is recursive.
- ◉ Every nondeterministic PDA can be converted to an equivalent deterministic PDA.

Which one of the following regular expressions represents the language: the set of all binary strings having two consecutive 0s and two consecutive 1s? * 2 points

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

- ○ A
- ◉ B
- ○ C
- ○ D

Which of the following statements is/are FALSE? 1. For every non-deterministic Turing machine, there exists an equivalent deterministic Turing machine. 2. Turing recognizable languages are closed under union and complementation .3. Turing decidable languages are closed under intersection and complementation. 4. Turing recognizable languages are closed under union and intersection. * 2 points

- ○ 1 & 4
- ○ 1 & 3
- ◉ 2 only
- ○ 3 only

Let L1 be a recursive language. Let L2 and L3 be languages that are recursively enumerable but not recursive. Which of the following statements is not necessarily true? * 2 points

- ○ L2 – L1 is recursively enumerable.
- ◉ L1 – L3 is recursively enumerable
- ○ L2 ∩ L1 is recursively enumerable
- ○ L2 ∪ L1 is recursively enumerable

S -> aSa|bSb|a|b; The language generated by the above grammar over the alphabet {a,b} is the set of * 2 points

- ○ All palindromes
- ◉ All odd length palindromes.
- ○ Strings that begin and end with the same symbol
- ○ All even length palindromes

Let L = L1∩L2, where L1 and L2 are languages as defined below: * 2 points

L1 = {a^{m}b^{m}ca^{n}b^{n} | m, n >= 0 } L2 = {a^{i}b^{j}c^{k} | i, j, k >= 0 } Then L is

- [ ] Not recursive
- [ ] Regular
- [x] Context free but not regular
- [ ] Recursively enumerable but not context free.

Consider the CFG with {S,A,B) as the non-terminal alphabet, {a,b) as the terminal alphabet, S as the start symbol and the following set of production rules S --> aB S --> bA B --> b A --> a B --> bS A --> aS B --> aBB A --> bAA * 2 points

Which of the following strings is generated by the grammar?

- [ ] aaaabb
- [ ] aabbbb
- [x] aabbab
- [ ] abbbba

For the above the correct answer have how many Derivation * 1 point

- [ ] 1
- [ ] 2
- [ ] 3
- [x] 4

CFG (Context Free Grammar) is not closed under * 2 points

- ○ Union
- ◉ Complementation
- ○ Kleene star
- ○ Product

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