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**Presidency University**

**Bengaluru**

**SCHOOL OF ENGINEERING**

**Make-Up Examinations July 2024**

**Course Code**: CSE2018

**Course Name**: THEORY OF COMPUTATION

**Program** : CSE

**Date**:19 /July /2024

**Time**: 9.30 AM – 12.30 PM

**Max Marks**: 100

**Weightage**: 50%

**Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Do not write any matter on the question paper other than roll number.*

**Part A [Memory Recall Questions]**

**Answer all the Questions. (5Qx 4M= 20M)**

1. Differentiate between DFA and NFA (C.O.No.1) [Knowledge]

2. Define the following with example i) String ii) Kleen Closure (C.O.No.1) [Knowledge]

3. Define PDA? List its applications (C.O.No.3) [Knowledge]

4. Define Turing Machine? How the transition can be represented in Turing Machine (C.O.No.4) [Knowledge]

5. Explain E-Closure with example (C.O.No.2) [Knowledge]

**Part B [Thought Provoking Questions]**

**Answer all the Questions. (5Qx10M=50M)**

6. Construct DFA accepting the language L={wab| w belongs to (a+b)\*}, that is ending with ab, also write the machine for the same and check whether the string aaababab is accepted or not

(C.O.No.1) [Comprehension]

7. Convert the following NFA to DFA

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Description automatically generated

(C.O.No.2) [Comprehension]

8.Using pumping lemma theorem prove whether the language L={anb2n | n>=0} is regular are not.   
 (C.O.No.3) [Comprehension]

9. Define NFA. Construct the NFA accepting the strings of a’s and b’s having substring aba. Write the machine for the same.

(C.O.No.2) [Comprehension]

10. Define Derivation? Given the grammar derive the left most derivation and right most derivation for the given string

i) S-> aAS|aSS

A->SbA|ba String: aabaa.

ii) E->E+E

E-> E\*E

E->a|b|c String: a\*b+c

(C.O.No.3) [Comprehension]

**Part C [Problem Solving Questions]**

**Answer all the Questions. (2Qx15M=30M)**

11. Construct PDA for the given language L={anbn | n>=1}. Also write the instantaneous descriptor for the string aaaabbbb.   
 (C.O.No. 2) [Application]

12. Construct a Turing Machine to accept the strings L={anbncn | n>=1}.  
 (C.O.No. 4) [Application]