

Roll No																			
---------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF ENGINEERING
MID TERM EXAMINATION - APR 2023**

Semester : Semester IV -2021

Course Code : CSE2018

Course Name : Sem IV - CSE2018 - Theory of Computation

Program : ALL PROGRAM

Date : 15-APR-2023

Time : 9:30AM - 11AM

Max Marks : 50

Weightage : 25%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS

(5 X 2 = 10M)

1. Define alphabet. Give example for alphabet set of decimal numbers. (CO1) [Knowledge]
2. Explain Kleene Closure of an alphabet with example. (CO1) [Knowledge]
3. Illustrate any two operations on string with examples. (CO1) [Knowledge]
4. What is extended transition function? Explain with an example. (CO2) [Knowledge]
5. What is meant by DFA? Explain with an example. (CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

(4 X 5 = 20M)

6. Construct a DFA to accept strings of a's and b's having an even number of a's and an odd number of b. (CO1) [Comprehension]
7. Construct a DFA to accept the language.
 $L = \{w \in \{a,b\}^*; w \text{ has all strings that ends with } abb\}$ (CO1) [Comprehension]

8. Design an NFA (non-deterministic finite automata) to accept the set of strings of 0's and 1's that either
 (a) end in 010 and have 011 somewhere preceding, or
 (b) end in 101 and have 100 somewhere preceding.
 (CO2) [Comprehension]
9. Construct NFA that accepts strings of a's and b's that are ending with ab/ba. Show the sequence of moves made by the NFA for the strings "abab" and "babaa". Find if the strings are accepted or rejected by NFA.
 (CO2) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS

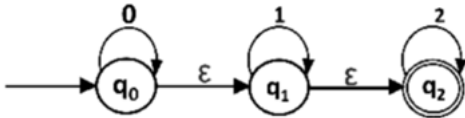
(2 X 10 = 20M)

10. Minimize the following DFA to its equivalent machine.

	δ	0	1
\rightarrow A	B	F	
B	G	C	
*C	A	C	
D	C	G	
E	E	F	
F	C	G	
G	G	E	
H	G	C	

(CO2) [Application]

11. Develop an equivalent DFA of the following e-NFA.



(CO2) [Application]