PRESIDE	NIVER	SITY

SCHOOL OF ENGINEERING

END TERM EXAMINATION - JAN 2023

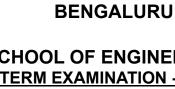
Semester : Semester V - 2020 Course Code : CSE2018 Course Name : Sem V - CSE2018 - Theory of Computation Program : B.Tech. CBC/CBD/CCS/CSD/CDV/CIT/CSG/CST/ECM/ECI/ISE/IST

Instructions:

(i) Read all questions carefully and answer accordingly. (ii) Question paper consists of 3 parts. (iii) Scientific and non-programmable calculator are permitted.

PART A

	ANSWER ALL THE TEN QUESTIONS	10 X 2 = 20M
1.	Compare the powers of different types of automata witha an example each.	
2.	List the operations of strings.	(CO1) [Knowledge]
2	Define Non Deterministic Finite Automata (NFA).	(CO1) [Knowledge]
		(CO2) [Knowledge]
4.	Construct NFA for L= { all strings with prefix ab) } over {a,b}.	(CO2) [Knowledge]
5.	The grammar G=({S}, {a, b}, S, P) Where P ={S \rightarrow aaSbb ab ϵ } is a CFG. Find the language represented by given g	grammar. (CO3) [Knowledge]
6.	The grammar G=({S}, {a, b}, S, P) Where P ={S \rightarrow aSa, S \rightarrow bSb, Sà ϵ } is a CFG. Find the language represented by	
7	Differentiate between DPDA and NPDA.	(CO3) [Knowledge]
		(CO4) [Knowledge]
8.	Mention the ways of representing the Deterministic PDA.	(CO4) [Knowledge]
9.	Define the transition function in TM.	(CO5) [Knowledge]
10.	Write the hierarchy of Languages in Theory of Computation.	
		(CO5) [Knowledge]



Date : 9-JAN-2023 Time: 9.30AM - 12.30PM Max Marks: 100 Weightage : 50%

Roll No

PART B

ANSWER ALL THE FIVE QUESTIONS

Minimize the following DFA to its equivalent machine? 11.

(CO2) [Comprehension]
Define DFA. Design a DFA accepting the language L={ w0100w w belongs to {0, 1}*}

(CO2) [Comprehension]

(CO3) [Comprehension]

Using pumping lemma theorm prove that the language $L = \{ w \in \{a,b\}^* : na(w) < nb(w) \}$ is not regular. 13. (CO3) [Comprehension]

Construct PDA for L={ $0^n 1^m 2^m 3^n$, n &m >=1} 14.

12.

15. Write all stack operations used for PDA construction along with example and stack diagram. (CO5,CO2) [Comprehension]

PART C

ANSWER ALL THE TWO QUESTIONS

16. Construct a Turing machine for L= $\{1^n 2^n 3^n, n \ge 1\}$. Write Transition Diagram, Transition Table, TM Tuples, one string acceptance and one string rejection.

(CO4) [Application]

17. Define a Turing machine. Also, design a turing machine to accept the set of all palindromes over {0,1}* with transition table. Write the transition diagram for the constructed turing machine and write the sequence of ID's for the input string '1001'

(CO5) [Application]

	0	1	
->A	В	F	
В	G	С	
*C	A	С	
D	С	G	
Е	E	F	
F	С	G	
G	G	Е	
Н	G	С	

5 X 10 = 50M

2 X 15 = 30M