MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

III B.Tech I Sem Regular End Examination, December 2022
Formal Languages and Automata Theory
(CSE/IT/CSI)

Time: 3 Hours.   **Max. Marks: 70**

Note: 1. Question paper consists: Part-A and Part-B.
2. In Part – A, answer all questions which carries 20 marks.
3. In Part – B, answer any one question from each unit.
   Each question carries 10 marks and may have a, b as sub questions.

PART- A

(10*2 Marks = 20 Marks)

1.	a)	Draw a NFA which accepts the set of all strings whose second last symbol is 1?	2M	CO1	BL1
	b)	Construct a Finite Automata that accepts {0,1}+	2M	CO1	BL1
	c)	If a Regular grammar G is given by S → aS/a. Find DFA (M) accepting L(G)?	2M	CO2	BL3
	d)	Construct a regular grammar for L= {$0^n 11/n>=1$}	2M	CO2	BL3
	e)	Define parse tree with an example.	2M	CO3	BL3
	f)	Define Push Down Automata?	2M	CO3	BL1
	g)	Write the general procedure to transform a grammar to Chomsky Normal Form?	2M	CO4	BL1
	h)	Write a procedure for eliminating unit productions?	2M	CO4	BL1
	i)	What is offline Turing Machine?	2M	CO5	BL1
	j)	Define Post correspondence problem?	2M	CO5	BL1

PART- B

(10*5 Marks = 50 Marks)

2	a)	Construct an NFA for r = (a+bb)* ba*	5M	CO1	BL3
	b)	Write in detail the Chomsky hierarchy of formal languages?	5M	CO1	BL1

OR

3	a)	Construct a NFA equivalent to the regular expression (10+11)*00.	5M	CO1	BL3
	b)	Construct mealy machine to Moore machine for the given figure	5M	CO1	BL6

4	a)	Write the steps to convert regular expression to DFA with a an example?	5M	CO2	BL1
	b)	Discuss in brief about applications of pumping lemma?	5M	CO2	BL2

OR

5	a)	Explain in brief about closure properties of regular languages?	5M	CO2	BL4
	b)	Write in brief about the algebraic rules for regular expressions?	5M	CO2	BL1

6	a)	Construct a Derivation tree for the string 0011000using the grammar S→A0S/0/SS, A→S1A/10 ?	5M	CO3	BL3
	b)	Construct a PDA for L={wcw^R /w (0+1)*}	5M	CO3	BL3

OR

7	a)	Show that L={a^p /p is prime} is not Context free by using pumping lemma?	5M	CO3	BL3
	b)	Show that for every PDA then there exists a CFG such that L(G)=N(P)?	5M	CO3	BL3

8	a)	Construct Turing machine for the language containing the set of strings Σ = (a, b, c) of palindrome.	5M	CO4	BL3
	b)	Design a Turing Machine to recognize the language {a^n b^n c^n / n>=1}	5M	CO4	BL6

OR

9	a)	Discuss in brief about closure properties of Context free languages?	5M	CO4	BL2
	b)	Design Turing machine and its transition diagram to accept the language L = { a^n b^n| n >=1}	5M	CO4	BL6

10	a)	Explain in detail about NP Complete and NP hard problems	5M	CO5	BL4
	b)	Define Post Correspondence Problem? Explain in brief about PCP with an example	5M	CO5	BL4

OR

11	a)	What is decidability? Explain in brief about any two undecidable problems?	5M	CO5	BL4
	b)	Explain about the Decidability and Undecidability Problems?	5M	CO5	BL4

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CO - Course Outcome   BL - Blooms Taxonomy Levels