R22

Model Question Paper
ANURAG Engineering College
(An Autonomous Institution)
III B.Tech II Semester Regular Examinations, June-2025
FORMAL LANGUAGES AND AUTOMATA THEORY
(CSE)

Time: 3 Hours   **Max.Marks:60**

Section – A (Short Answer type questions)		Course Outcome	B.T Level	Marks
Answer All Questions				**(10 Marks)**
1.	Define Finite Automata.	CO1	L1	1M
2.	List out the applications of Finite Automata?	CO1	L1	1M
3.	Define a Regular Expression.	CO2	L1	1M
4.	List out any four Identity Rules of Regular Expressions.	CO2	L1	1M
5.	Define CFG.	CO3	L1	1M
6.	What is an Ambiguous Grammar?	CO3	L1	1M
7.	Difference between Finite Automata and PDA.	CO4	L1	1M
8.	State different ways of Acceptance by PDA.	CO4	L1	1M
9.	List out different types of Turing Machines.	CO5	L1	1M
10.	What is Post Correspondence Problem?	CO5	L1	1M
Section B (Essay Questions)				
Answer all questions, each question carries equal marks.				**(5 X10M = 50M)**
11.	Construct NFA with ε which accepts a language consisting the strings of any number of 0's followed by any number of 1's followed by any number of 2's And also convert into NFA without ε transitions.	CO1	L3	10M
	OR			
12.	Convert to a DFA the following NFA.	CO1	L3	10M
13.	Convert the following Regular expression to Finite Automata. **(a+b)*(aa+bb)(a+b)***	CO2	L3	10M
	OR			
14.	Explain about Pumping Lemma.	CO2	L2	10M
15.	Construct CNF for the given grammar whose productions are	CO3	L3	10M

For question 12, the NFA transition table:

State\input	0	1
->q0	{q0,q1}	q0
q1	q2	q1
q2	q3	q3
	φ	q2
q3		

$$S \rightarrow A/B/C$$
$$A \rightarrow aAa/B$$
$$B \rightarrow bB/bb$$
$$C \rightarrow aCaa/D$$
$$D \rightarrow baD/abD/aa$$

	OR			
16.	i) Describe about Ambiguity in CFG with an Example.	CO3	L3	5M
	ii) According to the following grammar			5M
	E → E + E / E * E / id			
	Find the LMD and RMD of following string id+id*id			
17.	Construct PDA for WWʳ over {0,1}*	CO4	L3	10M
	OR			

18.	Construct the equivalent PDA for given grammar whose productions are
	    S->aAA
	    A->as/bs/a
		CO4	L3	10M

19.	Design a Turing Machine to accept L={WcWʳ| W is in (a+b)*}	CO5	L3	10M
	OR			
20.	Write a short note on post correspondence problem with suitable example?	CO5	L2	10M