R18

ANURAG Engineering College
(An Autonomous Institution)
II B.Tech II Semester Supplementary Examinations, June/July-2024
FORMAL LANGUAGES AND AUTOMATA THEORY
(COMPUTER SCIENCE AND ENGINEERING)

Time: 3 Hours   **Max. Marks: 75**

Section – A (Short Answer type questions)   (25 Marks)
Answer All Questions

		Course Outcome	B.T Level	Marks
1.	List the difference between NFA and DFA.	CO1	L1	2M
2.	Draw a finite automata which generate a set of strings over {a, b}, in which the second symbol from left hand is a.	CO1	L2	3M
3.	Write the properties of a language.	CO2	L1	2M
4.	Write any four identity rules of a regular expression.	CO2	L2	3M
5.	What is left recursion and left factoring.	CO3	L1	2M
6.	Define right linear grammar with example.	CO3	L2	3M
7.	Define Linear Bounded Automata.	CO4	L1	2M
8.	What is Context Sensitive grammar.	CO4	L2	3M
9.	List types of Turing machines.	CO5	L1	2M
10.	Write the moves in Turing machine.	CO5	L2	3M

Section B (Essay Questions)
Answer all questions, each question carries equal marks.   (5 X 10M = 50M)

11. A)	Construct NFA for $(0 + 1)^*101$ and Convert to DFA.	CO1	L3	10M
	OR			
B)	Draw the transition diagram for NFA which accepts all strings with either two consecutive 0's or two consecutive 1's.	CO1	L3	10M
12. A)	Construct NFA for the regular expression $(010)^*1+(1^*0)^*$.	CO2	L3	10M
	OR			
B)	Prove the following regular expression $\varepsilon+1^*(011)^*(1^*(011)^*)^* = (1+011)^*$.	CO2	L3	10M
13. A)	Construct a regular grammar for $(ab+a)^*(aa+b)$.	CO3	L3	10M
	OR			
B)	Explain pumping lemma for regular sets in detail.	CO3	L3	10M
	Show that the following grammar is ambiguous. $E \rightarrow id/E+E/E^*E/E-E$.			
14. A)	Design PDA by using empty store for accepting a language $L=\{ wcw^R \mid w \in (a+b)^*$ where w^R is reverse of w $\}$.	CO4	L3	10M
	OR			
B)	construct a PDA accepting the set of all strings over the alphabet {a, b} with equal number of a's and b's.	CO4	L3	10M
15. A)	Discuss various types of Turing machines.	CO5	L3	10M
	OR			
B)	Define PCP. Give the solution of PCP A = (b, a, ca, abc) and B = (ca, ab, a, c).	CO5	L3	10M