Code No: 114AG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year II Semester Examinations, July/August - 2021
FORMAL LANGUAGES AND AUTOMATA THEORY
(Computer Science and Engineering)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks
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1. Design a DFA (*deterministic* finite automaton) to accept the language L1={α∈ {a, b, c}*|α starts and ends with the same symbol}. Only draw the transition diagram, and clearly indicate the start state and the final state(s). [15]

2. Let L be a set accepted by an NFA. Prove that there exists a deterministic finite automaton that accepts L. Is the converse true? Justify your answer. [15]

3. Prove that if L is a regular set the L is generated by some left linear grammar or Right linear grammar. [15]

4. Design DFA for the following regular expression $(0+1)^* 01101(0+1)^*$. [15]

5. Design PDA for the Language $L = \{wcwR / w \in (0+1)^*\}$ [15]

6. Design Turing Machine for the Languages $L = \{0^n 1^n 2^n / n \geq 1\}$. [15]

7. Show that L is recognized by a Turing machine with a two way infinite tape if and only if it is recognized by a Turing machine with a one way infinite tape. [15]

8. What do you mean by Halting problem of Turing machine? Explain briefly. [15]

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