BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)

B. Tech. Sem - III Computer Science & Business System : WINTER : 2023

SUBJECT : FORMAL LANGUAGE & AUTOMATA THEORY

Day : Friday

Date : 1/12/2023

Time : 10:00 AM-01:00 PM

W-24142-2023

Max. Marks : 60

N.B.

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Assume suitable data **WHEREVER** necessary.

Q.1 Draw NFA for string ending with 'ab' and convert it to equivalent DFA **(10)**

OR

Q.1 Write a note on **(10)**

a) Pseudo Graph
b) Complement of Graph
c) Spanning Tree
d) Threaded Binary Tree

Q.2 Write note on Pumping lemma. Using Pumping lemma for regular language prove that **(10)**

$L = \{a^m b^n \mid m > n\}$ is not regular

OR

Q.2 Design NFA and DFA for all string contains even no of 0's and odd no of 1's. **(10)**

Q.3 Design finite automata for following regular expression **(10)**

i) $(10+10^*) + (11+00)^*$

ii) $(001+(01)^*.(010^*)$

OR

Q.3 What is regular grammar? Explain in detail left linear and right linear grammar. **(10)**

Q.4 Design turing machine for well formedness of parentheses. **(10)**

OR

Q.4 Design turing machine for 1's & 2's complement of given binary no "0101010" **(10)**

Q.5 Construct push down automata (PDA) accepting language consisting of even palindromes string contains a's and b's. **(10)**

OR

Q.5 Differentiate between deterministic and non deterministic Turing machine. **(10)**

Q.6 When the problem is said to be undecidable? Briefly explain halting problem of TM. **(10)**

OR

Q.6 Differentiate between P, NP and NP Complete with example. **(10)**

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