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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year II Semester Regular Examinations July-2021

FORMAL LANGUAGES AND AUTOMATA THEORY

(Common to CSE & CSIT)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 a Define Grammar. Construct the Grammar for the language $a^n b^n, n > 0$. L3 6M
b Compare DFA and NFA. L2 6M

OR

- 2 a Contrast Mealy machine and Moore machine. L4 6M
b Analyze and explain with example Chomsky Hierarchy. L4 6M

UNIT-II

- 3 a Construct an equivalent FA for the given regular expression $(0+1)^*(00+11)(0+1)^*$. L3 6M
b From the identities of RE, prove that: L3 6M
i) $10+(1010)^*[\wedge+(1010)^*]=10+(1010)^*$
ii) $(1+100^*)+(1+100^*)(0+10^*)(0+10^*)=10^*(0+10^*)^*$.

OR

- 4 a Convert the given RG to FA. L3 6M
S \rightarrow aA/bB/a/b
A \rightarrow aS/bB/b
B \rightarrow aA/Bs
b Construct an equivalent FA for the given regular expression. L6 6M
 $10 + (0 + 11) 0^* 1$

UNIT-III

- 5 a Define Ambiguous grammar with an example. L1 6M
b Perform left factor for the grammar $A \rightarrow abB/aB/cdg/cdeB/cdfB$. L3 6M

OR

- 6 a Write the process adapted to convert the grammar into CNF? L2 6M
b Convert the following grammar into CNF. L3 6M
S \rightarrow bA/aB
A \rightarrow bAA/aS/a
B \rightarrow aBB/bS/a.

UNIT-IV

- 7 a State Push Down Automata. L1 6M
b Construct a NPDA to accept the language $L = \{WW^R / W \in (a,b)^*\}$ by empty stack and final state. L6 6M

OR

- 8 a Define Instantaneous description (ID) in PDA. L1 6M
b Define push down automata? Explain acceptance of PDA with final state. L2 6M

UNIT-V

- 9 a Describe Instantaneous Description of Turing Machine. L2 6M
- b Explain about the graphical notation of TM. L3 6M
- OR**
- 10 a Explain the procedure adapted to convert RE to TM. L2 6M
- b Convert the given regular Expression $(a+b)^*(aa+bb)(a+b)^*$ to TM. L3 6M

*** END ***