

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Regular & Supplementary Examinations June-2024
FORMAL LANGUAGES AND AUTOMATA THEORY

(Common to CSE & CSIT)

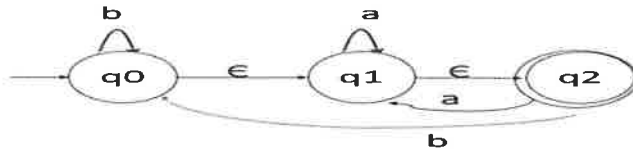
Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a Analyze and explain with example Chomsky Hierarchy. CO1 L4 4M
b Convert the following NFA with ϵ moves to DFA. CO2 L6 8M



OR

- 2 a Describe Finite Automata with Output. CO1 L2 6M
b Write why minimization of finite automata is required and explain the procedure adapted for minimization of finite automata. CO1 L6 6M

UNIT-II

- 3 a List out the identities of Regular expression. CO3 L1 6M
b From the identities of RE, prove that CO3 L3 6M
i) $10+(1010)^* [^+(1010)^*] = 10+(1010)^*$
ii) $(1+100^*)+(1+100^*)(0+10^*)(0+10^*)^* = 10^*(0+10^*)^*$

OR

- 4 a Convert the given RG to FA. CO2 L3 6M

$S \rightarrow aA/bB/a/b$

$A \rightarrow aS/bB/b$

$B \rightarrow aA/bS$

- b Construct a regular grammar for the given regular expression CO1 L6 6M

$ab(a+b)^*$

UNIT-III

- 5 a State what is meant by derivation and parse tree with examples. CO4 L1 4M
b Construct Leftmost and Rightmost derivation and derivation tree for CO4 L6 8M

the string 0100110

$S \rightarrow 0S/1AA$

$A \rightarrow 0/1A/0B$

$B \rightarrow 1/0BB$

OR

- 6 a Write the process adapted to convert the grammar into CNF. CO4 L2 4M
b Convert the following grammar into CNF. CO4 L3 8M

$S \rightarrow bA/aB$

$A \rightarrow bAA/aS/a$

$B \rightarrow aBB/bS/a$.

UNIT-IV

- 7 a State the formal of PDA. CO5 L1 4M
b Construct a PDA which recognizes all strings that contain equal number of 0's and 1's. CO5 L6 8M

OR

- 8 a State NPDA. CO5 L1 2M
b Construct a NPDA to accept the language $L = \{ WW^R / W \in (a,b)^* \}$ by empty stack and final state. CO5 L6 10M

UNIT-V

- 9 a Convert the given regular Expression $(a+b)^*(aa+bb)(a+b)^*$ to TM. CO6 L3 6M
b Discriminate Universal Turing machine. CO6 L5 6M

OR

- 10 a Differentiate PCP and MPCP. CO6 L4 4M
b Find the PCP solution for the following sets. CO6 L5 8M

A	B
10	101
01	100
0	10
100	0
1	010

*** END ***