R18

Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations July-2021
FORMAL LANGUAGES AND AUTOMATA THEORY
(Common to CSE & CSIT)

Time: 3 hours   Max. Marks: 60

PART-A
(Answer all the Questions 5 x 2 = 10 Marks)

1	a	Define Melay machine and Moore machine.	2M
	b	List out the identities rules of Regular expression.	2M
	c	Write what is Left recursion and Left factoring.	2M
	d	What is Instantaneous description (ID) in PDA?	2M
	e	Describe Turing reducibility.	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	Write the Procedure for Minimization of FA (Equivalent Method)?	3M
	b	Minimize the following DFA	7M

Present states	i/p=0	i/p=1
q0	q1	q2
q1	q2	q3
q2	q2	q4
* q3	q3	q3
*q4	q4	q4
q5	q5	q4

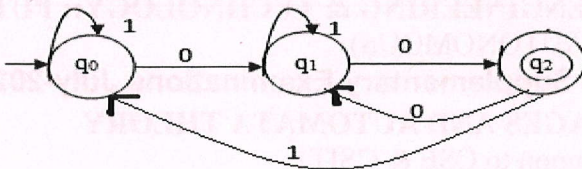**Here q0 is initial state and q3 and q4 are final states

OR

3	Write down procedure for Myhill- Nerode theorem with a given example ('*' means final states)	10M

Present State	Next State	
	I/P=a	I/P=b
→A	B	F
B	A	F
C	G	A
D	H	B
E	A	G
*F	H	C
*G	A	D
*H	A	C

UNIT-II

4   Explain about Arden's theorem, Construct RE from given Finite Automata   **10M**

OR

5   **a** Construct FA from RG   **4M**
S->aA/bB/a/b
A->aS/bB/b
B-> aA/bS

b Construct an equivalent FA for given regular expression $(0+1)*(00+11)(0+1)*$ **6M**

UNIT-III

6   Convert the following grammar into Greibach normal form   **10M**
$S \rightarrow AA/a$ $A \rightarrow SS/b$

OR

7   **a** Define derivation tree? Construct Derivation tree, Leftmost and Rightmost   **7M**
derivation and Right most derivation for the string 11001010
$S \rightarrow 1B/0A$ $A \rightarrow 1/1S/0AA$ $B \rightarrow 0/0S/1BB$

b Construct CFG for the language consisting of palindromes of the string   **3M**

UNIT-IV

8   Convert the following PDA into an equivalent CFG   **10M**
$\delta (q_0,a_0,z_0) \rightarrow (q_1,z_1z_0)$
$\delta(q_0,b,z_0) \rightarrow (q_1,z_2z_0)$
$\delta(q_1,a,z_1) \rightarrow (q_1, z_1z_1)$
$\delta(q_1,b,z_1) \rightarrow (q_1, \lambda)$
$\delta(q_1,b,z_2) \rightarrow (q_1,z_2z_2)$
$\delta(q_1,a,z_2) \rightarrow (q_1, \lambda)$
$\delta(q_1, \lambda,z_2) \rightarrow (q_1, \lambda)$ // accepted by the empty stack

OR

9   Construct PDA for the following Grammar.   **10M**
$S \rightarrow aB$
$B \rightarrow bA/b$
$A \rightarrow aB$

UNIT-V

10   Define PCP. Verify whether the following lists have a PCP solution   **10M**
$\left(\begin{smallmatrix} abab \\ ababaaa \end{smallmatrix} \right), \left(\begin{smallmatrix} aaabbb \\ bb \end{smallmatrix} \right), \left(\begin{smallmatrix} aab \\ baab \end{smallmatrix} \right), \left(\begin{smallmatrix} ba \\ baa \end{smallmatrix} \right), \left(\begin{smallmatrix} ab \\ ba \end{smallmatrix} \right), \left(\begin{smallmatrix} aa \\ a \end{smallmatrix} \right).$

OR

11   Explain the various types of Turing machine with suitable examples   **10M**

END