Q.P Code: 16CS517 **R16**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations Feb-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 Consider the below finite automata and check the strings are accepted or not **6M**

States (Q)	Input Alphabtes	
	0	1
→q0	q1	q3
q1	q0	q2
(q2)	q3	q1
q3	q2	q0

(i) 1110 (ii) 0001 (iii) 1010

b a) Define Finite Automaton. **6M**

b) Show that (0*1*)* = (0+1)*.

c) Define Mealy machine and Moore machine.

OR

2 a a) Write about relations on sets. **6M**

b) List out the identities of Regular expression.

b Construct DFA for the given NFA **6M**

	Next state	
	0	1
→ q0	q0,q1	q0
q1	q2	q1
q2	q3	q3
(q3)	-	q2

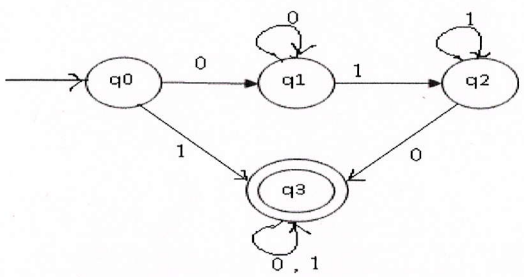
UNIT-II

3 a Explain how equivalence between two FA is verified with an example. **8M**

b List out the identities of Regular expression. **4M**

OR

4 a Construct the RE for the Given FA using Arden's theorem **7M**



b Construct an equivalent FA for the given regular expression (0+1)*(00+11)(0+1)* **5M**

UNIT-III

	a	Explain the closure properties of context free languages.	**6M**
5	**b**	Convert the following grammar into CNF. S→bA/aB A→bAA/aS/a B→aBB/bS/a.	**6M**
		OR	
6	**a**	Explain about derivation and parse trees? Construct the string **0100110** from the Leftmost and Rightmost derivation. S→0S/1AA A→0/1A/0B B→1/0BB	**5M**
	b	Write the procedure and Eliminate left recursion from the following Grammar E→E+T/T T→T*F/F F→(E)/id	**7M**

UNIT-IV

7	**a**	Construct a PDA which recognizes all strings that contain equal number of 0's and 1's.	**6M**
	b	Define push down automata. Explain acceptance of PDA with empty stack.	**6M**
		OR	
8	**a**	Construct an equivalent PDA for the following CFG. S→aAB | bBA A→bS|a B→aS | b.	**6M**
	b	Write the process for convert PDA into an equivalent CFG.	**6M**

UNIT-V

9	**a**	Write about Universal TM.	**4M**
	b	Construct a Turing machine that recognizes the language $L=\{a^n b^n, n>1\}$.	**8M**
		OR	
10	**a**	Define PCP.	**2M**
	b	Explain the various types of Turing machine.	**10M**

*** END ***