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

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

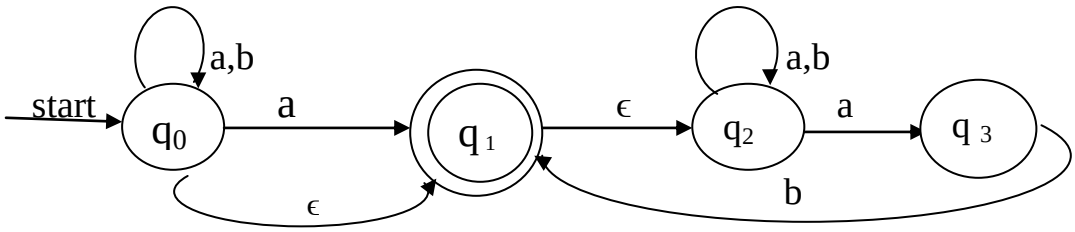
SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular Examinations November 2018
FORMAL LANGUAGES AND AUTOMATA THEORY
(Computer Science & Engineering)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1 **a** Construct equivalent DFA for the following ϵ-NFA



8M

b List out the applications of finite state machines. 4M

OR

2 **a** Specify the procedure for Myhill- Nerode theorem with an example. 8M

b Write about relations on sets. 4M

UNIT-II

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

b Prove that the language L= $\{a^n b^n c^n | n>=1\}$is not regular. 7M

OR

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

b Discuss briefly about the applications of pumping lemma. 4M

UNIT-III

5 **a** Convert the following grammar into Greibach normal form.
S→AA/a
A→SS/b 7M

b What is a linear grammar? Explain with an example. 5M

OR

6 **a** Consider the following CFG.
S→aSbS/bSaS/ϵ and find the language accepted by the grammar. 7M

b Define left recursion and how do you eliminate it from the grammar. 5M

UNIT-IV

7 **a** Construct PDA to accept the set of strings over {a,b} consisting of equal number of a's and b's. 8M

b Write the process for converting PDA into an equivalent CFG. 4M

OR

8 **a** Construct PDA from the following Grammar
S→0BB
B→0S/1S/0 8M

b Explain acceptance of PDA with empty stack. 4M

UNIT-V

9	**a**	Define Post's correspondence problem and explain with an example.	7M
	b	What is Universal Turing machine? Discuss.	5M
		OR	
10	**a**	Design a Turing machine which multiplies two unary numbers.	8M
	b	Draw and explain the transition diagram for Turing machine.	4M

*** END ***