TONTADARYA COLLEGE OF ENGINEERING

(Department of CSE)

Internal Assessment – I (18CS54)

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Subject : ATC
Semester : V

Date : 13/10/2020
Time : 12.00 to 01.30pm

Answer following questions choosing one question from each part **Total Marks: 50**

PART-A

			CO
Q1	a) Define the following terms with example i) Strings and Functions on Strings ii) Kleene Star & Kleene Plus	7M	(CO1)
	b) Why to study Theory of Computation? Applications of theory of computation.	6M	(CO1)
	OR		
Q2.	a) Differentiate DFA, NFA. Design NFA to recognize the following set of strings 0101, 101, 1111	7M	(CO1)
	b) Construct a DFA which accept the language $L = \{w \mid w \in \{a,b\}^* \text{ and } \lvert w\rvert \bmod 3 >= \lvert w\rvert \bmod 2\}$	6M	(CO1)
Q3	a) Explain in detail Machine based hierarchy of language classes	6M	(CO1)
	b) Define DFSM. Construct DFA for the following i) L= {*w* ∈ {a, b}* : every a region in w is of even length}. ii) L= {*w* ∈ {a, b}*: *every **a** is immediately followed by **b***}.	7M	(CO1)
	OR		
Q4	a) Draw a DFA to accept Decimal strings divisible by three (3).	7M	(CO1)
	b) Obtain DFA to accept the Strings of 0's and 1'shaving i)ending with 011 ii) substring 00	6M	(CO1)

PART-B

			CO
Q5	a) Obtain DFA to accept the following language i) Strings of 0's,1's and 2's beginning with s '0' followed by odd number of 1's and ending with a '2'. ii) Strings of a's and b's starting with at least two a's and ending with at least two b's.	6M	(CO2)
	b) Define NFA. Design NFA to recognize the following set of strings abc, abd and aacd.	6M	(CO2)
	OR		
Q6	a) Define Languages. Explain Functions on Languages	6M	(CO2)
	b) Draw DFA to which accepts even a's and odd b's	6M	(CO2)
Q7	a) Obtain DFA to accept the Strings of a's and b'shaving i)Exactly one a ii) Atleast one a iii) not more than three a's	6M	(CO2)
	b) Obtain DFA to accept the language L={awa |w∈(a+b)*}	6M	(CO2)
	OR		
Q8.	a) Construct a DFA which accept the language $L = \{w \mid w \in \{a,b\}^* \text{ and } w \bmod 5 \neq 0\}$	6M	(CO2)
	b) List the techniques for designing DFA. Design DFA accepts strings of 0's and 1's where the value of each string is represented as a Binary numbers only. The Strings representing 0 module 5 should be accepted Ex: 0000,0101,1010,1111 etc.	6M	(CO2)

Course Outcome	Complete Title
CO1	Describe Finite Automata (FA) as a mathematical model of a system. Describe Computation and ideas. To explain Deterministic Finite Automata (DFA) ,Non Deterministic Finite Automata (NFA) are used to recognize the languages.
CO2	Design hierarchy of language classes, DFA and NFA, with minimum number of states that improves the efficiency of the machines.