Siliguri Institute of Technology
Department of CSE /Internal Exam I Year 2020
Formal Language and Automata Theory PCC- CS403
Full Marks: 30 Time: 60Mins

Group-A:

1. Answer the following.[5 x 1 =5]

I. There are _____ tuples in finite state machine.
a) 4 b) 5 c) 6 d) unlimited

II. According to Chomsky classification finite automata is of
a) Type 0 b) Type 1 c) Type 2 d) Type 3

III. Minimum number of states require to accept string ends with 10.
a) 3 b) 2 c) 1 d)None of these

IV. Transition function maps.
a) Σ * Q —> Σ b) Q* Q —> Σ c) Σ * Σ —> Q d) Q* Σ —> Q

V. Which is a True statement:
a) Every DFA is a NFA a) Every NFA is a DFA

Group-B

Answer any two. [2 x 5= 10]

2.Construct a FA, where number of 0's and number of 1's divisible by 3 over alphabet set ∑ = {0,1}.

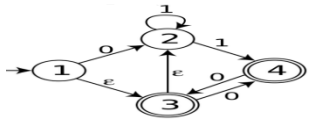
3. Construct a FA, where every string end with 'ab' over alphabet set ∑ = {a,b}.

4. Construct a FA, where every string contain three consecutive 1's over alphabet set ∑ = {0,1}.

Group-C

Answer any one. [1 x15= 15]

5. a) Construct a DFA, for the following NFA. 7



b) Write the Regular Expressions for the following. 4+4=8
i. Containing even number of 0's
ii. Set of all words with at least two b's over the alphabet set {a, b}.

6. a) Minimize the DFA given in the following table 8

Q/∑	0	1
→Q_0	Q_1	Q_2
Q_1	Q_2	Q_3
Q_2	Q_2	Q_4
*Q_3	Q_3	Q_3
*Q_4	Q_4	Q_4
*Q_5	Q_5	Q_4

b) Construct a FA, that accepts all strings over{0, 1} having even number of 1's and each 1 is followed by at least one 0. 7

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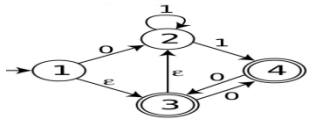

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