

National University of Computer and Emerging Sciences, Lahore Campus



Course: Theory of Automata-I
Program: BS (CS)
Duration: 20 Minutes
Paper Date: 22 September 2020
Section: A
Exam: Quiz 2

Course Code: CS301
Semester: Fall 2020
Total Marks: 15
Weight
Page(s): 2

Instruction/Notes: Attempt all questions on the question paper.

Name: _____ Roll Number: _____

1. [5] Find DFA for the following language on $\Sigma = \{a, b\}$. (Try and do this in as few states as possible)
 - a) $L = \{w: (nb(w) - na(w)) \bmod 3 > 0\}$ //to be done by roll numbers ending with even number
 - b) $L = \{w: (na(w) - nb(w)) \bmod 4 > 0\}$ //to be done by roll numbers ending with odd number

Note: $nb(w)$: number of b 's in word w , $na(w)$: number of a 's in word w

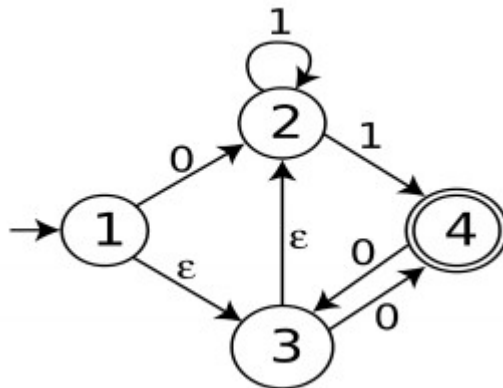
2. [8]

Consider a coin flipping game in which you will be given a chance to flip the coin thrice, you will only win the game if the results of all your flips are same.

Create a complete state diagram of deterministic Finite Automata for this game.

3. [2]

Determine whether the following strings are accepted or not by the NFA given below. If accepted, show the path of acceptance:



a) 00001111

b) 1000