

# 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: B  
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)  $L = \{w: (nb(w) - na(w)) \bmod 5 > 0\}$  //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

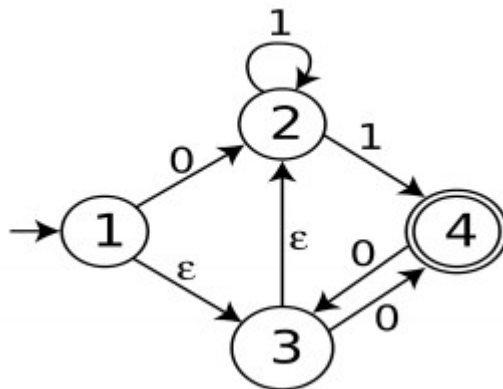
**Note:**  $nb(w)$ : number of  $b$ 's in word  $w$ ,  $na(w)$ : number of  $a$ 's in word  $w$

2. [8]

Create a Deterministic Finite Automata that accepts strings over 0,1 such that their decimal equivalent is multiple of 2 and greater than 3.

3. [2]

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



a) 1000

b) 0111101