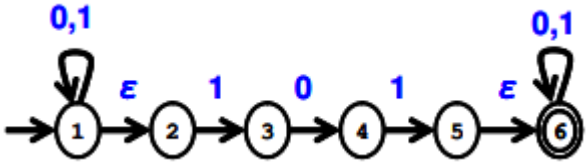
Assignment 2 – CS 301 - Theory of Automata – Fall 2020

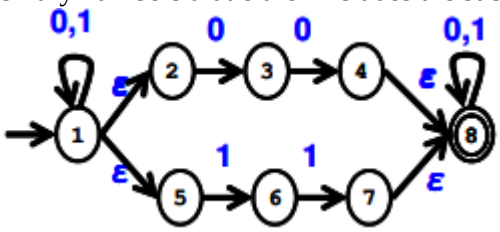
Total Marks: 60 **Due: Wednesday, Sept 30, 2020 (online – 5 PM)**

Note: Late submissions will have 25% deduction. Submission after Friday (Oct 5 – 2 PM) will not be accepted.

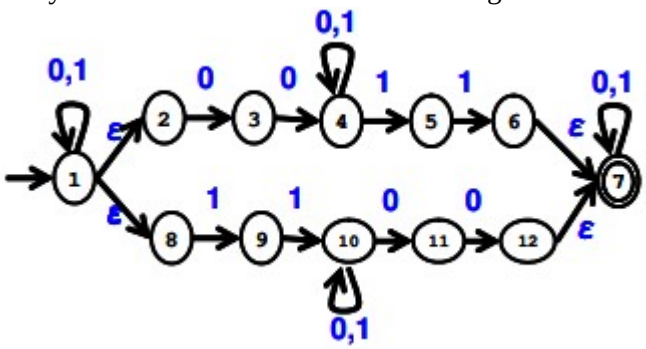
1. [4 * 5] Give NFA (or NFA-null) for the following languages, over the alphabet {0,1}
   Part a, b, c from https://www.cs.umd.edu/class/spring2017/cmsc330/tests/prac2-soln-fall09.pdf
   a. All binary numbers that include the substring “101”



   b. All binary numbers that either includes the substring “00” or “11”.



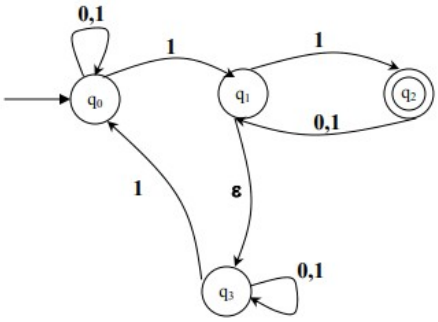
   c. All binary numbers that includes both substrings “00” and “11”.



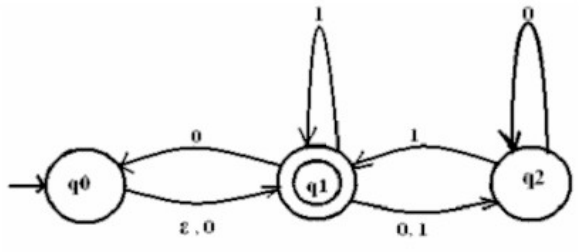
   d. All binary numbers such that the third digit and the second last digit is 1.

2. [4*10] Given the following NFAs (or NFA-null) convert them to DFA using subset construction method.

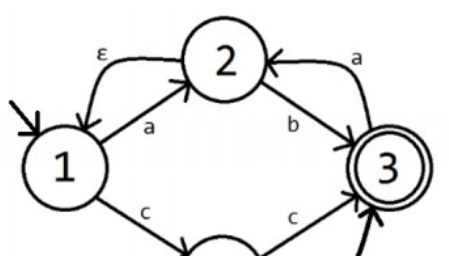
a.



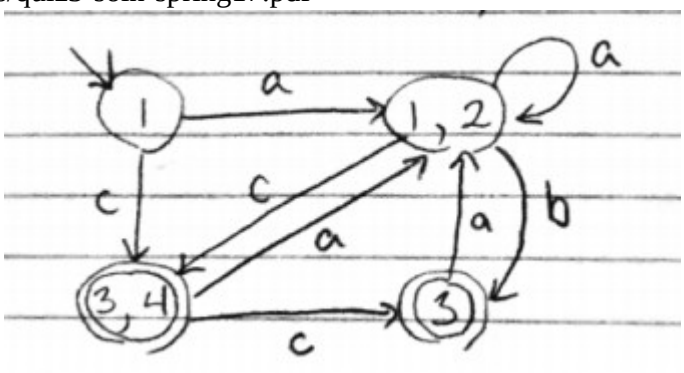
b.

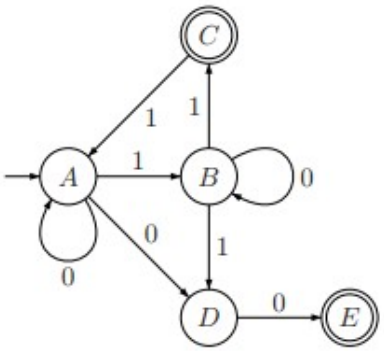


c. https://www.cs.umd.edu/class/spring2017/cmsc330/tests/quiz3-soln-spring17.pdf



SOLUTION:





d.

SOLUTION https://courses.engr.illinois.edu/cs373/fa2011/exams/mockmidterm1-sol.pdf