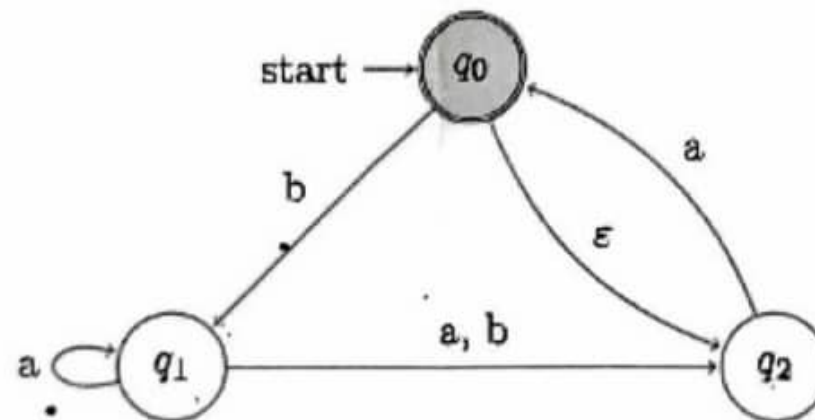


Fall 2024
CSE228 – Theory of Computation
Quiz-1

Section: 64_H

Time: 30 Minutes

- Q1. Draw a DFA for the following language defined over $\Sigma = \{0,1\}$ [2.5]
 $L = \{w \mid w \text{ contains either } 010 \text{ or } 101 \text{ as substrings}\}$
- Q2. Draw a NFA for the following language defined over $\Sigma = \{0,1\}$ [2.5]
 $L = \{w \mid w \text{ begins or ends with } 00 \text{ or } 11\}$
- Q3. Convert the following NFA to equivalent DFA [10]



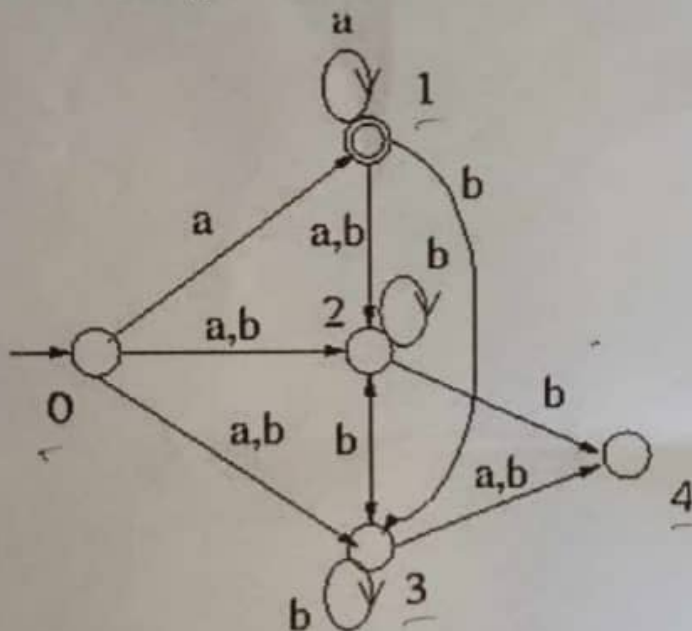
Daffodil International University
Computer Science & Engineering
Theory of Computation

Time: 30 minutes

Marks: 15

Quiz 1

1. Construct a DFA that accepts strings over $\{a, b\}$ that contain exactly two 'a's.
2. Create an NFA that accepts strings over $\{0, 1\}$ that can have either the pattern "00" or "11" anywhere in the string.
3. Convert the following NFA to DFA

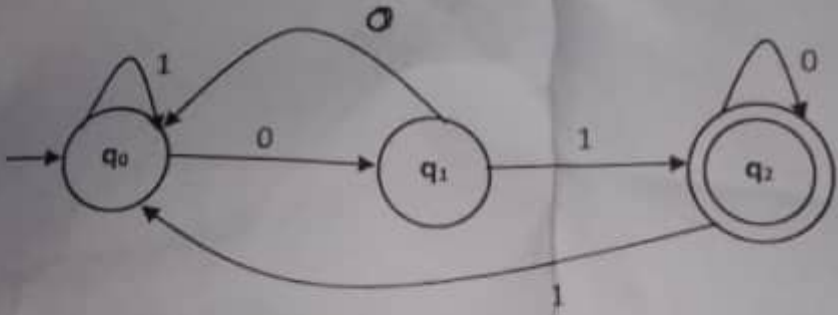
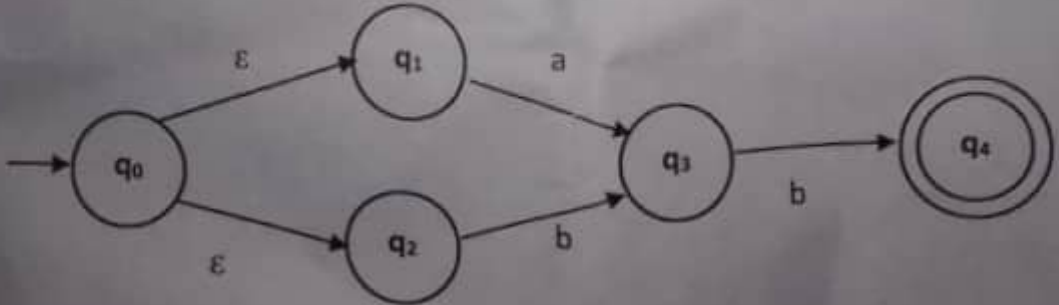


Quiz – 01

Course Code: CSE228
Full marks: 15

Course Title: Theory of Computation
Time: 40 Minutes

Answer each of the following questions

1.	<p>a) What is theory of computation, and what are its primary goals in computer science and mathematics?</p> <p>b) Suppose two languages $L_1 = \{a, ab, bb\}$ and $L_2 = \{aa, b\}$. Perform intersection, and concatenation operation on the Languages.</p>	1+2
2.	<p>a) Let M be the Deterministic Finite Automata (DFA) shown below</p>  <pre> graph LR q0((q0)) -- 1 --> q0 q0 -- 0 --> q1((q1)) q1 -- 0 --> q1 q1 -- 1 --> q2(((q2))) q2 -- 0 --> q2 q2 -- 1 --> q0 </pre> <p>Provide a formal description of M.</p> <p>b) Construct deterministic finite automata to recognize odd number of 1's and even number of 0's?</p>	3+3
3.	<p>a) Construct an NFA accepting binary strings with three consecutive 0's.</p> <p>b) Convert the ϵ - NFA into its equivalent DFA.</p>  <pre> graph LR q0((q0)) -- epsilon --> q1((q1)) q0 -- epsilon --> q2((q2)) q1 -- a --> q3((q3)) q2 -- b --> q3 q3 -- b --> q4(((q4))) </pre>	2+4