VIT
SCHOOL OF INFORMATION TECHNOLOGY AND ENGINEERING
CONTINUOUS ASSESSMENT TEST – I - WINTER SEMESTER 2019-2020

Programme Name & Branch: B.Tech.IT

Course Name Code: ITE1006

Course Name: Theory of Computation

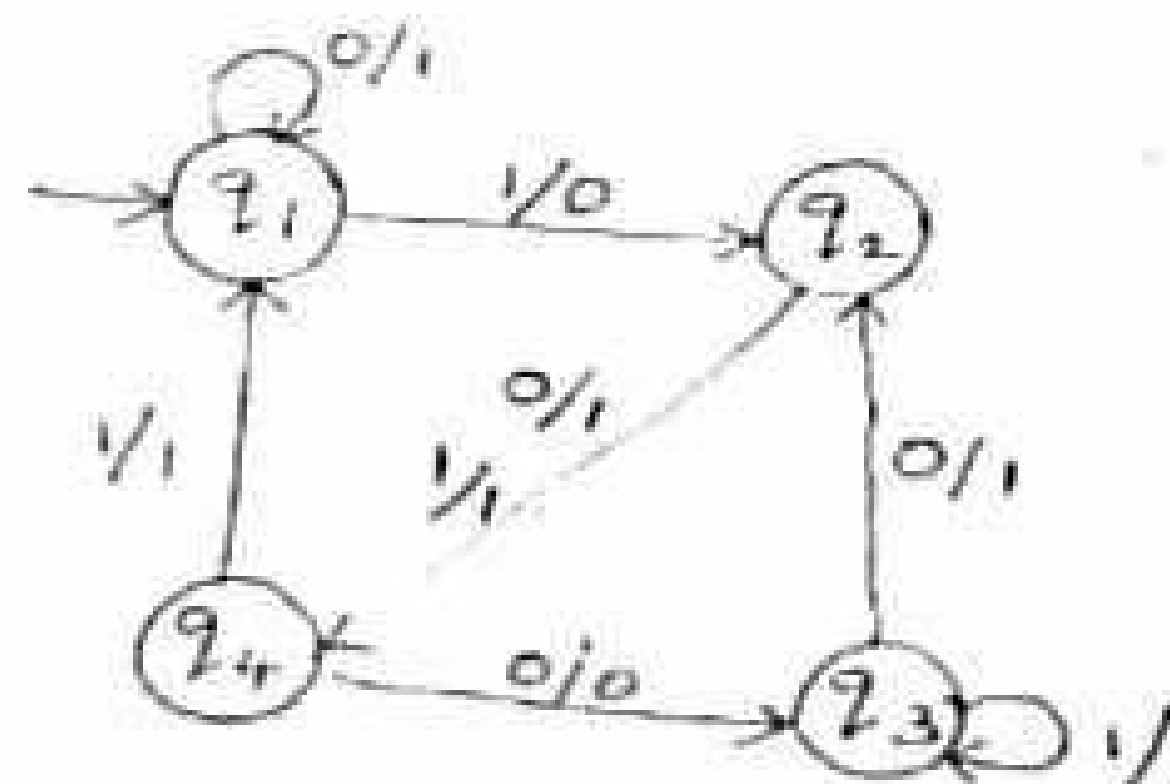Faculty Name(s): Dr. Swarna Priya RM, Dr. Viswanathan P

Exam Duration: 90 mins   Maximum Marks: 50

General instruction(s):

Answer ALL Questions

Section A (4*5=20)

1. Give the state diagram and transition table of NFA recognizing the language   L = {w/w contains even number of 0's or exactly two 1's} with six states or fewer over an alphabet $\Sigma = \{0, 1\}$

2. (i)   Prove by mathematical induction :   **(3 Marks)**
$$\sum_{i=1}^{n} i^2 = \frac{n(n + 1)(2n + 1)}{6}$$

(ii)   For the language L = {01,2} over the set A={0,1, 2}. Find L^3, L^2, L^1 and L^0 **(2 Marks)**

3. Design a DFA to accept the language L = {w|w is of even length and begins with ab} where inputs are a's and b's.
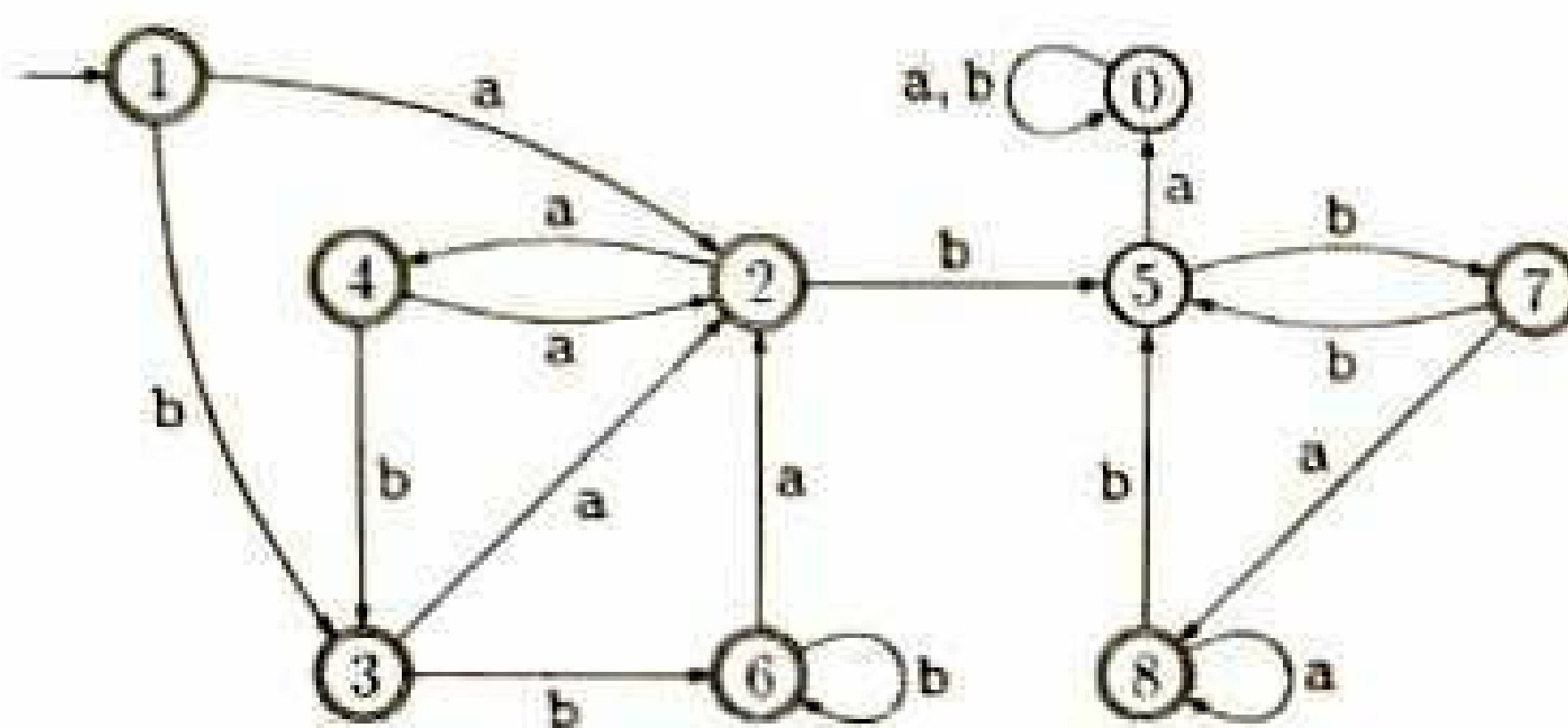
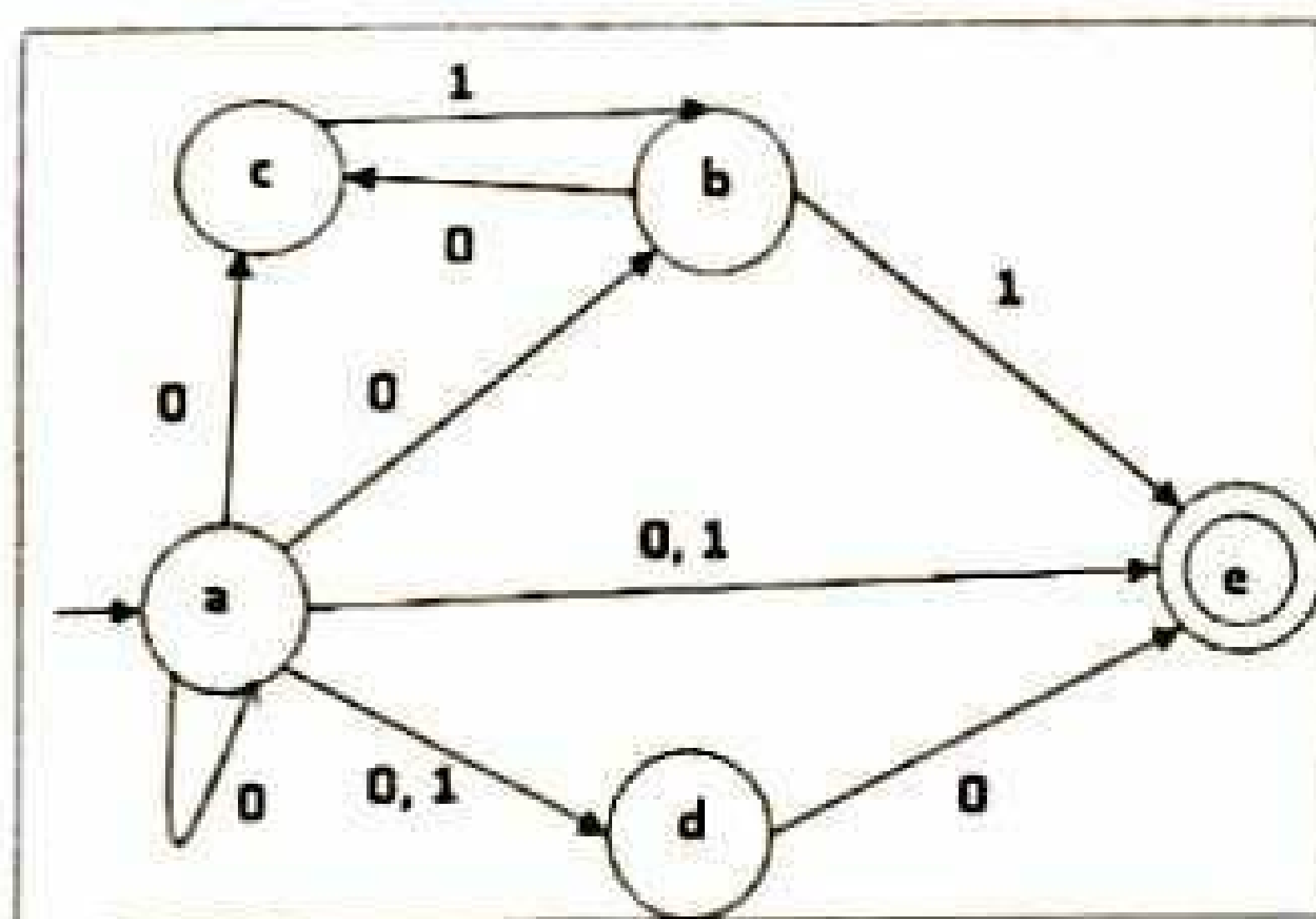4. Convert the given Mealy machine into Moore machine.

Section B (3*10=30)

5. For a NFA with ε moves shown below determine the strings accepted by it. Construct an equivalent NFA without ε moves.

States	Input symbols		
	a	b	ε
→ q0	{q1}	-	-
* q1	{q1}	-	{q2}
q2	-	{q0}	-

6. Construct minimized DFA for the following transition diagram using Myhill-Nerode Theorm.

7. Design an equivalent DFA for the given NFA

bce