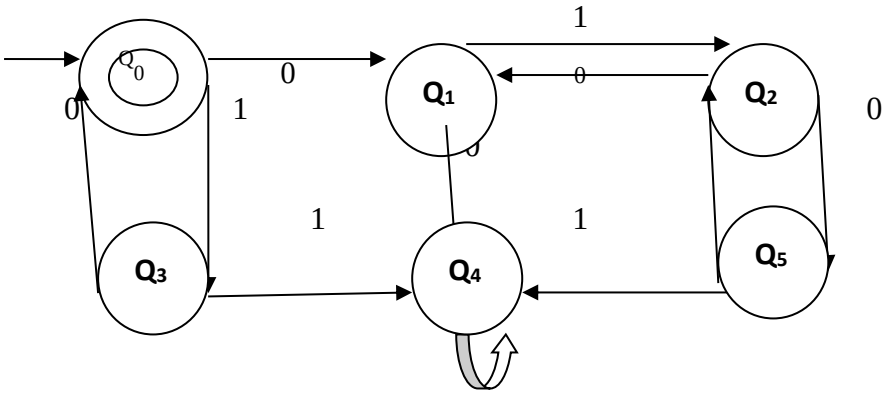
Assignment No – 1
Theory of Computation
ETCS -206

Q.1. Minimize the following DFA using partitioning method.



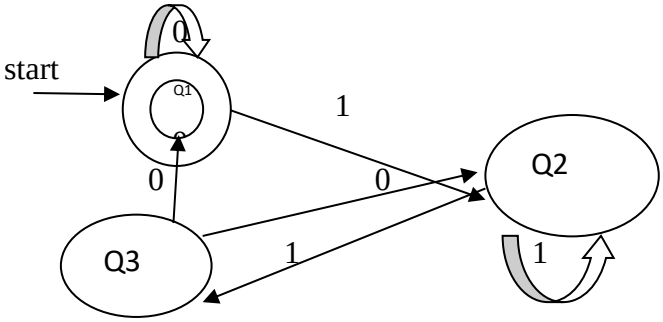
Q.2. We say that two regular languages are equal if they have the same regular expression representation or DFAs. Let L1 and L2 denote two regular languages, one of them is given to you as a regular expression while the other is represented as a DFA. How would you verify that they are equal? Describe your steps in detail.

Q3. Draw a deterministic and non-deterministic finite automate which accept 00 and 11 at the end of a string containing 0, 1 in it, e.g., 01010100 but not 000111010.

Q.4. Draw a deterministic and non-deterministic finite automaton which accept a string containing "the" anywhere in a string of {a-z}, e.g., "there" but not "those".

Q.5. Prove that $L=\{0^n1^{2n} \mid n>=1\}$ is not regular. Also give proof of the theorem used.

Q6. Generate a regular expression corresponding to the given state diagram using Arden's Theorem.



Q.7. Consider the mealy machine described in the transition table, construct its equivalent Moore Machine

Present state	Next state			
	Input a = 0		Input a = 1	
	State	Output	State	Output
q_1	q_3	0	q_2	0

q_2	q_1	1	q_4	0
q_3	q_2	1	q_1	1
q_4	q_4	1	q_3	0

Q.8. Give a regular expression for the following regular languages, assuming the alphabet is Σ := {0, 1}.

(a) The set of all strings, when viewed as binary representation of integers, that are divisible by 2.

(b) The set of all strings containing 00.

(c) Give a closed-form regular expression for the set of all string not containing consecutive 00.