BVM College of Management Education, Gwalior

Question Bank

MCA 304

Theory of Computationn

Unit I

Q Question : Attempt very short notes

(a) Melay Machine & Moorre Machine

(b) What do you mean by DFA & NDFA ?

(c) Transition System

(d) Define Autometon

Question : Attempt short notes

(a) Explain the 4-bit shift register

(b) Define Graph & Tree with example.

(c) What do you mean by the Relation & function . Explain with example.

Define long answer type question

1. Prove the following are by mathematical induction

   10^{2n}-1 is divisible by 11 for all n>=1

2. Prove the following are by mathematical induction

   $\Sigma 1/k(k+1)=n/(n+1)$ where k=1 to n

3. Construct a moore machine which is equivalent to the Mealy machine given in following Table

Present	Next State			
	a=0		a=1	
State	State	Ouptput	State	Output
q1	q1	1	q2	0
q2	q4	1	q4	1
q3	q2	1	q3	1
q4	q3	0	q1	1

Q.4 Consider a Mealy Machine represented by following fig. construct a Moore machine equivalent to this Mealy machine

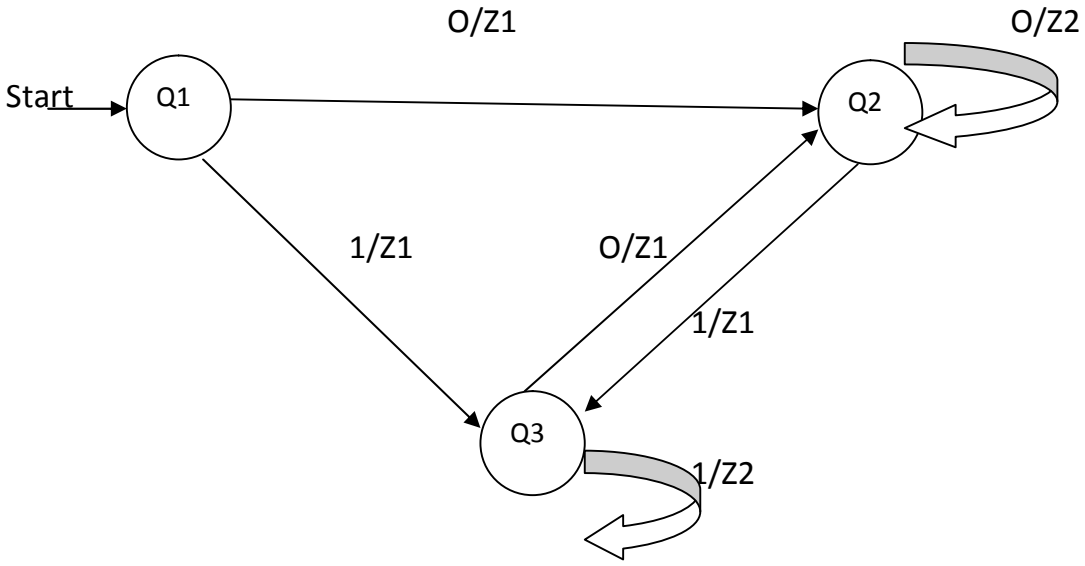

Fig. Mealy machine

Q.5 Construct a Minimmum state automanton equivalent to the finite automaton

State	0	1
q0	q1	q5
q1	q6	q2
Q2	q0	q2
q3	q2	q6
q4	q7	q5
q5	q2	q6
q6	q6	q4
q7	q6	q2

Q.6 Construct a Mealy machine which can output EVEN ,ODD according as the total number of 1's Encountered is even or odd.The input symbols are 0 & 1

Q7 Construct a deterministic finite automaton equivalent to M=({q0,q1,q2,q3},{a,b},δ,q0,{q3}) , Δ is given in table

State/Σ	a	b
q0	q0,q1	q0
q1	q2	q1
q2	q3	q3
Q3		q2

Q.8 Consider the finite finite state machine whose transition function δ is given in following table in the form of transition table Here Q={q0,q1,q2,q3},Σ={0,1},F={q0}. Given the entire sequence of state for the input string 110101