

Dr. Shyama Prasad Mukherjee University, Ranchi
MCA, Semester – II
Model Question

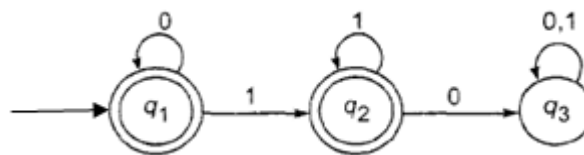
Subject - Automata Theory
F.M - 75

Group – B

Direction: Answer any five

5*5=25

1. Construct a DFA which accepts set of all string containing even number of 0's and even number of 1's. Also draw its transition table.
2. Differentiate between Mealy Machine and Moore Machine.
3. What do you understand by Ambiguity in Grammar? Explain with help of an example.
4. What is pushdown Automata? Explain with Example.
5. Construct Finite Automata that accepts set of all strings with prefix 'ab' over $\Sigma = \{a, b\}$.
6. Define Regular Expression. Find Regular Expression of the following transition diagram:



7. What is Grammar? Construct grammar for following languages:
a) $L(G) = \{ a^n b^n : n \geq 0 \}$ b) $L(G) = \{ a^n b a^n : n \geq 1 \}$
8. Explain halting problem.
9. Explain PCP with help of example.

Group –C

Direction: Answer any Two

15*2=30

10. What is Chomsky classification of Grammar? Explain with example.
11. Design Turing Machine for $L = \{a^n b^n : n \geq 1\}$
12. Explain Turing machine. Design Turing machine for $L = \{0^n 1^n 2^n : n \geq 1\}$
13. What is Mealy Machine? Convert following Mealy Machine to 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

14. Design PDA for $L = \{a^n b^n : n \geq 1\}$
15. Explain derivation tree with example.