M.Sc. 2nd Semester Midsem Examination

Subject:Automata and Compiler Design Paper Code: CSMC 202

(Full Marks – 20, Time: 1hr)

1. Answer any ***four***: 2×4=8

a) If there are n no. of inputs, how many outputs are generated by *Mealy* and *Moore* machines separately? Justify your answer.

b) Why do you need a *DFA* to be minimized?

c) Find a grammar in *Chomsky Normal Form* equivalent to $S \rightarrow aAbB$, $A \rightarrow aA \mid a$, $B \rightarrow bB \mid b$.

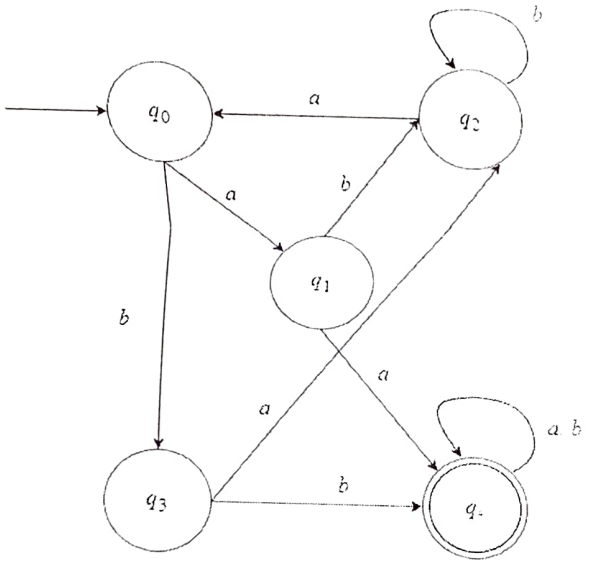
d) Derive the strings concretely generated by the *regular* expression $r = (1+01)^*(0+\lambda)$.

e) When is a production said to be *useless*? Explain with example.

2. Answer any ***three:*** 4×3=12

a) Construct a *Turing Machine* that accepts the language of 010 over $\Sigma = \{0, 1\}$.

b) Minimize the following *DFA*:



c) Construct a *Moore Machine* equivalent to the *Mealy Machine M* defined as follows:

Present State	Next State			
	G=0		G=1	
	State	Output	State	Output
$\rightarrow q_1$	q_1	1	q_2	0
q_2	q_4	1	q_4	1
q_3	q_2	1	q_3	1
q_4	q_3	0	q_1	1

d) Construct a grammar in *Greibach Normal Form* equivalent to the grammar $S \rightarrow AA \mid a$, $A \rightarrow SS \mid b$.