Code No: RA311202 **RA**

III B.Tech I Semester Regular Examinations, November/December 2005
THEORY OF COMPUTATION
(Information Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Differentiate NFA and DFA with respected to transition and acceptance.
   (b) Draw DFA which accepts even number of a's over the alphabet $\{a, b\}$
   (c) Construct DFA equivalent to the following Finite state machine. Figure 1 [2+6+8]

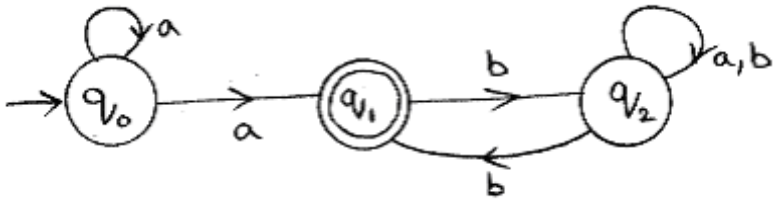

Figure 1:

2. (a) Construct the Moose machine for Figure 2 Melay machine.

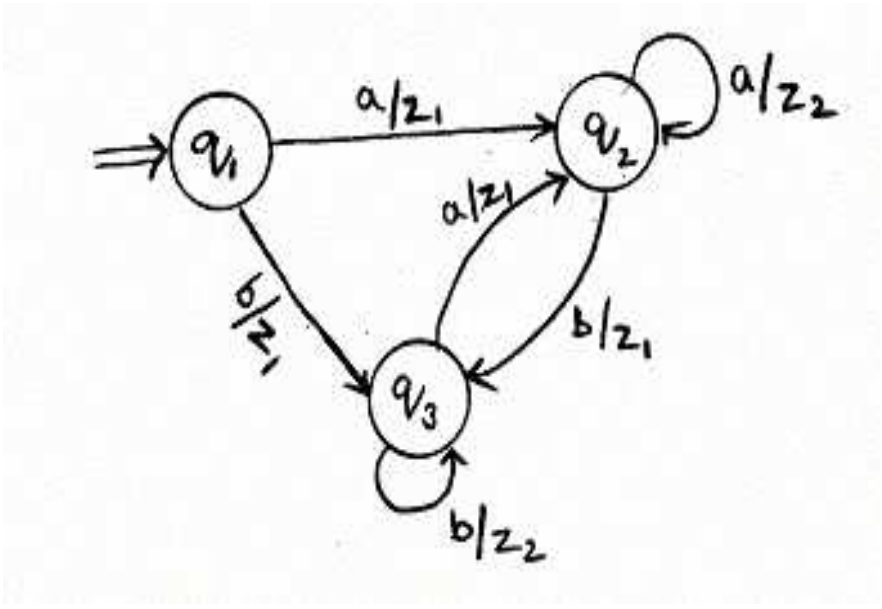

Figure 2:

   (b) Minimize the Finite automation Figure 3 below and show both the given and the reduced one are equivalent.

[6+10]

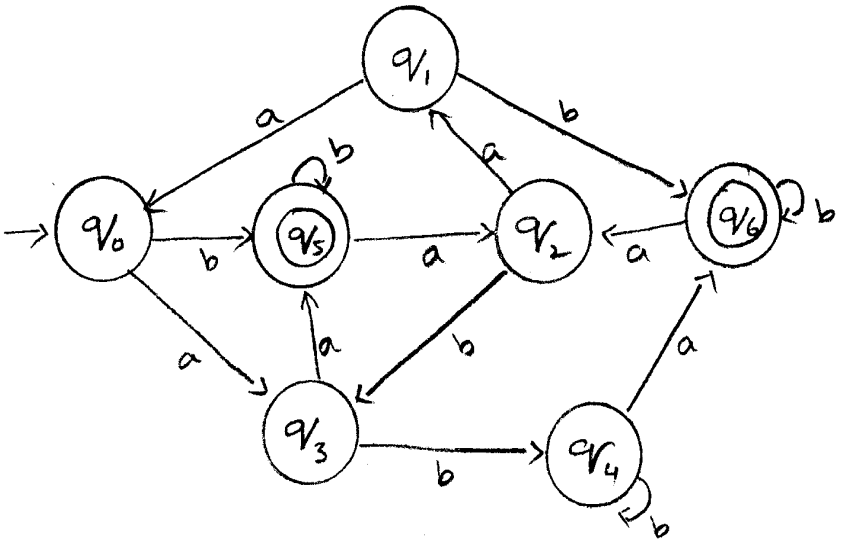

Figure 3:

3. (a) Construct the NFA for the regular expression r = 0*1 ((0+1)0*1)* (∈+(0+1)(00)*)+0(00)*

   (b) Consider the FA and construct regular expressions that is accepted by it. Figure 4 [8+8]

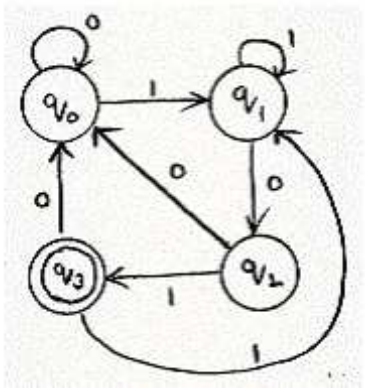

Figure 4:

4. (a) Construct left linear and right linear grammar for the regular expression. 0*(1(0+1))*

   (b) Give the CFG to generating the following sets
   The set of all strings over alphabet $\{a, b\}$ with exactly twice as many a's as b's. [8+8]

5. (a) Design a PDA which accepts all strings which can be derived from the following Grammar. Taking a suitable example verify the machine.

S → aB/bA
A → a/aS/bAA
B → b/bS/aBB

(b) Prove that acceptance by empty stack and by final state is equivalent. [8+8]

6. (a) Explain the procedure involved in the design of Turing Machine.
   (b) Design Turing Machine to recognize the following.
      i. To find out proper substraction of two integers.
      ii. To recognize L = L(0* 1). [4+12]

7. (a) Discuss different languages and their corresponding machines.
   (b) Write the design procedure of shift reduce parser by taking a suitable example. [8+8]

8. (a) Explain Rice's theorem for undecidable problems.
   (b) List the problems that are decidable for DCFL's. [8+8]

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