RUSTAMJI INSTITUTE OF TECHNOLOGY

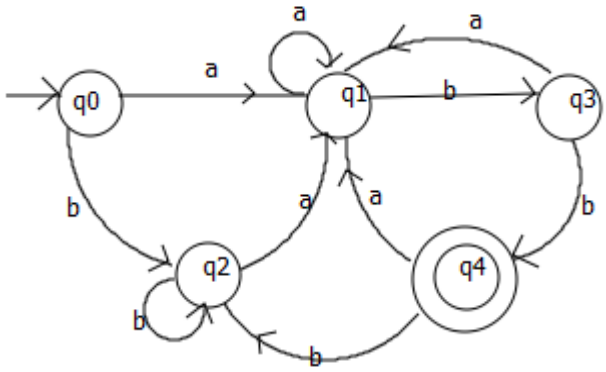
DEPARTMENT OF INFORMATION TECHNOLOGY

Elective-1 (IT-713) Automata and Compiler Design

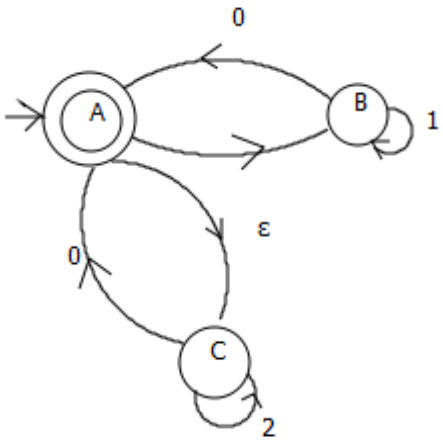
Assignment-I

Course Instructor – Mrs Mala Saraswat **Due on 15 Oct 2011**

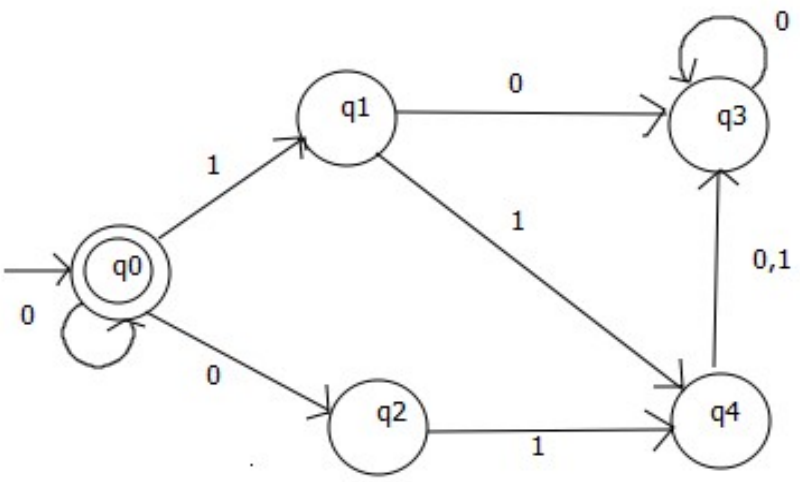
1) Construct a minimum state automaton for following DFA.



2) Convert the following into NFA without ε moves



3) Convert following NFA into its equivalent DFA. Also recognize the language generated by this DFA



4) Make a DFA for the language L = {x ε {0,1)* | x ends in 1 and does not contain substring 00}

5) Construct DFA that accepts the languages defined by regular expression 01[(10*111)* +0]*

6) Construct finite automata equivalent to following regular expression (11 + 0)* (00 + 1)* 01

7) Find regular expression corresponding to each of following subset of [0,1]
   i) The language of all strings containing at least two 0's
   ii) The language of all strings containing at most two 0's
   iii) The language of all strings ending with 1 and don't contain 00
   iv) The language of all strings in which both number of 0's and 1's are odd.

8) Design DFA which has second last symbol is 0.

9) Construct DFA for following regular sets:
   i) All strings of '0' and '1' that do not contain substring 011
   ii) All string of '0' and '1' ended with 011
   iii) All string with second last symbol '0'

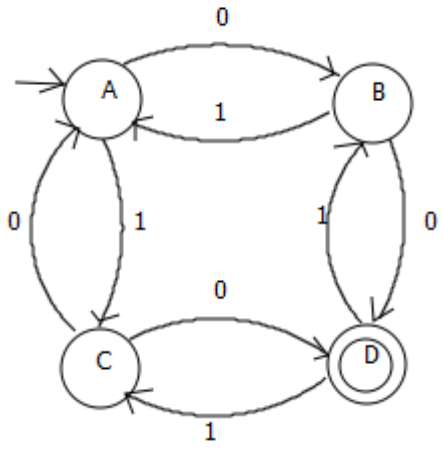
10) Design mod 4 machine with base 3.

11) Prove for every NFA there exists an equivalent DFA

12) Prove following identity:
   (a*ab + ba)*a* = (a + ab +ba)*

13) Convert following DFA's into regular expression.

a)



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