Code No: 45014 **R07** **Set No - 4**

III B.Tech I Semester Regular Examinations,Nov/Dec 2009
Formal Languages and Automata Theory
Computer Science And Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Design Turing Machine for L = { a^n b^n c^n | n ≥ 1 } [16]

2. (a) Prove the following identity: (a*ab + ba)* a* = (a + ab + ba)*
   (b) Construct transition systems equivalent to the regular expression (ab + a)* (aa +b) [8+8]

3. (a) If G=({S}, {0, 1}, {S→0S1, S→ ε}, S), find L(G).
   (b) Construct a G so that L(G) = {$a^n ba^m$ | m,n >= 1} [8+8]

4. Design Push Down Automata for the language L={ww^R | w ε (0+1)*} [16]

5. Convert the following Context Free Grammar to Greibach Normal Form
   G={({S,A,B},{a,b},P,S)}
   P is
   S→AB
   A→BS / a
   B→SA / b [16]

6. (a) Find NFA which accepts the set of all strings over $\{0, 1\}$ in which the number of occurances of 0 is divisible by 3 and the number of occurances of 1 is divisible by 2.
   (b) Draw the transition diagram for a NFA which accepts all strings with either two consecutive 0's or two consecutive 1's.
   (c) Differentiate NFA and DFA. [6+6+4]

7. (a) Write the steps in construction of minimum automaton.
   (b) Write the applications of Finite Automata.
   (c) Define NFA with ε-moves. [8+6+2]

8. Write about the following
   (a) Linear-Bounded Automata
   (b) Context-Sensitive Language
   (c) Decidability of PCP. [5+5+6]

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