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. (a) Construct a G so that L(G) = $\{a^n ba^m \mid m,n >= 1\}$

    (b) If G is S→aS | a, then show that L(G) = $\{a\}^+$ [8+8]

2. Design Turing Machine which will recognize strings containing equal number of 0's
    and 1's   [16]

3. (a) Construct a FA recognizing L (G), where G is the grammar S→aS | bA | b
        and A→aA| bS | a

    (b) Construct a DFA equivalent to the grammar S→aS | bS | aA, A→bB, B→aC,
        C→ ε [8+8]

4. Construct LR(0) items for the following grammar
    S → SA | A
    A → aSb | ab   [16]

5. (a) Convert the following grammar to Greibach Normal Form
        S→ SS
        S→0S1 | 01

    (b) Show that grammar is ambiguous
        S→aSbS | bSaS | ε [8+8]

6. (a) Explain the procedure to Convert the Context Free Grammar to Push Down
        Automata

    (b) Convert the following Context Free Grammar to Push Down Automata
        S→ aSbb | aab   [8+8]

7. (a) Define NFA with ε moves.

    (b) Differentiate Moore and Mealy machines.

    (c) Write the steps in minimization of FA.   [4+6+6]

8. (a) Draw the transition diagram of a FA which accepts all strings of 1's and 0's
        in which both the number of 0's and 1's are even.

    (b) Construct NFA which accepts the set of all strings over $\{0, 1\}$ in which there
        are at least two occurrences of 1 between any two occurrences of 0. Construct
        DFA for the same set.   [8+8]

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