

Code No: R7310501

R7

III B.Tech I Semester(R07) Supplementary Examinations, May 2011
FORMAL LANGUAGES AND AUTOMATA THEORY
(Computer Science & Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions
All questions carry equal marks

1. Define DFA (Deterministic Finite Automata) and discuss its performance in detail with a suitable example.
2. Prove the theorem 'Let L be a set accepted by non-deterministic finite automata, then there exists a DFA that accepts L'.
3. Construct a DFA for the following regular expression $[(aUb)^*(bUa)^*]^*$.
4. (a) Write the procedure for the conversion of right linear grammar to left-linear grammar.
(b) Explain the properties of deviation trees.
5. (a) Show that language containing strings formed from a, b and c in which the number of a's, number of b's and number of c's are equal is not a CFL.
(b) Prove that the union of two context free languages is also a context free language.
6. Write a procedure for designing a PDA recognizing a language generated by a given CFG. Find a CFG for the language of all strings over the alphabet {a, b} in which the number of a's in each string are more than the number of b's. Design the PDA for the grammar designed by you. Process the string aabba on the PDA and show the derivation in the grammar.
7. Explain any two techniques that can be used to construct TMs. Explain in detail about each technique with a suitable example.
8. (a) Explain about Chomsky hierarchy of Languages.
(b) Explain in detail about Universal Turing Machine.
