

Code: 9A12501

III B. Tech I Semester (R09) Supplementary Examinations, May 2012

AUTOMATA & COMPILER DESIGN

(Common to Computer Science & Systems Engineering & Information Technology)

Time: 3 hours

Max Marks: 70

 Answer any FIVE questions
 All questions carry equal marks

- 1 (a) Prove that for every NFA, there exists an equivalent DFA.
 (b) Design an NFA for the recognizing the language generated by $(a + b)^*ab$. Convert it into DFA.
- 2 Eliminate left recursion from the following grammar and then construct predictive parse table for the resultant grammar.

$$E \rightarrow E+T / T \quad T \rightarrow T^*F / F \quad F \rightarrow (E) / id$$
 Is the grammar LL (1). Show the moves of the parser for $a+a*a$.
- 3 (a) Explain the general method of bottom up parsing with an example.
 (b) Write in detail about the YACC parser generator.
- 4 (a) What is the use of a dependency graph for annotated parse trees? Explain with an example.
 (b) Write three address codes for the following C-program statements.
 if (a<b) { if (b<c) x = 1; } else x = 10;
- 5 Explain unrestricted grammar and give the recognizer for the unrestricted grammar.
- 6 Consider the following Pascal code and draw the activation record.

```

Program param(input , output);
  Procedure b(function h(n: integer): integer);
    Var m : integer;
    Begin m := 3;
    write in(h(2));
    End { b };
  Procedure c:
    Var m : integer;
    Function f(n: integer) : integer ;
    Begin f := m + n
    End { f }
  Procedure r;
    Var m : integer;
    Begin m := 7;
    B(f)
    End { r }
  Begin m := 0; r end { c };
Begin
  C
End.
```
- 7 Write about the following algorithms:
 (a) Detection of loop invariant computation. (b) Code motion.
- 8 Explain issues in the design of a code generator.
