C 14751   (Pages 2)   Name.............................

                                                               Reg. No.........................

SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2010

Computer Science

CS 04 605—COMPILER DESIGN

(2004 admissions)

Time : Three Hours   Maximum : 100 Marks

Answer all questions.

1. (a) What role does lexical analyzer play in a compiler ?

    (b) Write the steps involved in converting a regular expression to a NFA.

    (c) What are the properties of a LL (i) grammar ?

    (d) Draw the two different parse trees for the sentence id + id * id using the production rules

    $\in \rightarrow E + E / E * E / id$.

    (e) Name the different parameter parsing techniques available.

    (f) Write the syntax – directed translation scheme for infix – postfix translation.

    (g) Write the syntax directed definition to produce syntax trees for assignment statements.

    (h) Explain the concept of reduction in strength with example.

                                                               (8 × 5 = 40 marks)

2. (a) With a block diagram, explain the role of the different phases of a compiler bringing out the data structures used in each phase.
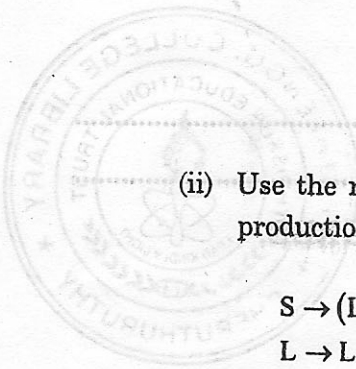
Or

    (b) Construct a minimum stale DFA for the following regular expression.

    $(0/1)^* 101 (0/1)^*$

                                                               (15 marks)

3. (a) (i) Explain the rules used to find the relationship between the terminals in an operator precedence parser.

                                                               (7 marks)

(ii) Use the rules and find the relationship between the terminals in the following set of production rules.

$$S \to (L)/a$$
$$L \to L,S/S$$

(8 marks)

Or

(b) (i) Explain any *one* parser generator illustrating how to use it of generating parse tree.

(8 marks)

(ii) Write the LR parsing algorithm.

(7 marks)

4. (a) Write the type checking translation scheme for any *five* different type of statements. Explain the same with examples.

(15 marks)

Or

(b) Explain saurcelanguage issues that occur during run time environments.

(15 marks)

5. (a) Write and explain the simple code generator algorithm.

(15 marks)

Or

(b) What is a flow graph ? Explain the process of constructing flow graphs and the use of flow graphs in code optimization.

(15 marks)

[4 × 15 = 60 marks]