Roll No. ..... Total Pages : 03

MCA/D-18 10136

COMPILER DESIGN

MCA-14-51

Time : Three Hours] [Maximum Marks : 80

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

1. (a) What do you mean by high level language ?
   (b) Write a regular expression for a language over (0, 1) which starts or end with either 00 or 11.
   (c) What are syntax and semantic errors ?
   (d) Why left recursion is not good for parsers ?
   (e) What do you mean by loop invariant in code ?

Unit I

2. What do you mean by a compiler ? Explain the phases a program undergoes during compilation using suitable example.

3. (a) What do you mean by Finite automation ? How are they used in lexical analysis phase ?

(b) Draw a FA for the language L = {w : w ∈ (a, b)* && $n_a(w)$ % 3 == 0 && $n_b(w)$ % 2 == 0}.

Unit II

4. (a) What do you mean by 3-address code representation of a code ? Explain.

   (b) What is a symbol table ? Why is it used in a program ? Explain which kind of information is stored in it.

5. What is a storage allocation scheme for programs ? Explain the types of allocation mechanism usign suitable examples.

Unit III

6. (a) What is a Top-Down parser ? When a grammar is ready to be parsed by it ? Explain using suitable example.

   (b) What is ambiguity in grammars ? Which parser is able to handle ambiguity and how ?

7. What is Shift-Reduce parser ? Explain the LR parsing algorithm on the below grammar as input :

   $E \rightarrow E + T$, $E \rightarrow T$, $T \rightarrow T*F$, $T \rightarrow F$, $F \rightarrow (E)$, $F \rightarrow id$

Unit IV

8. Explain the following :

   (a) Register allocation

   (b) Intermediate languages.

9. (a) What do you mean by code optimization ? Explain machine-dependent and independent optimization techniques.

   (b) What do you mean by DAG blocks ? Why are they used in code optimization ?