BT-7/D05   **9318**

COMPILER DESIGN (2004-05)

Paper—IT-465

Time : Three Hours]   [Maximum Marks : 100

Note :— Attempt any **FIVE** questions.

1. (a) What is compiler ? Explain different phases of compiler in detail.   12

    (b) Design a minimal DFA for the Language containing strings in which leftmost symbol differ from rightmost symbol $\Sigma = \{a, b\}$.   8

2. (a) Which of the following sentences can be derived from the given grammar, with S, as starting symbol ?   10

    In each case give a lefttmost derivation, rightmost derivation and derivation trees :

    $S \rightarrow aAcB \mid BdS$

    $B \rightarrow aAcA \mid cAB \mid b$

    $A \rightarrow aB \mid aBc \mid a$

    (i) aacb

    (ii) abcaabbabcd

    (iii) aacbbcc

    (iv) bccaacdca.

    (b) Construct an operator precedence parser table for the given grammar :

    $E \rightarrow E+T \mid T$

    $T \rightarrow T*F \mid F$

    $F \rightarrow (E) \mid id$.   7

    (c) Construct Precedence Function (if any) for (b).   3

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3. Discuss Run-time storage Allocation scheme in FORTRAN Language, in detail. 20

4. (a) Consider the following grammar and construct the SLR(1) parser table :

   E→E+E

   E→E*E

   E→(E)

   E→I

   I→I digit

   I→digit.

   Assume digit = 0, 1, 2, ... 9. 10

   (b) Parse 23*5+9 using parser table obtained in (a). 3

   (c) Discuss possible implementations of LR-parsers. 7

5. (a) Propose a Syntax-Directed translation scheme for assignment statement, with integer types. 12

   (b) Generate a three address code for A := −B* as (C+D), using scheme proposed in (a), considering A,B,C & D to be integer type Variables/Identifiers. 8

6. (a) What is DAG ? Give an algorithm for obtaining DAG for a given sequence of three address statements (or Basic Block). 10

   (b) What are various sources of code-optimization, during compilation ? Discuss briefly. 10

7. (a) Discuss various data structures used for implementations of Symbol Table in Compiler. 12

   (b) Explain lexical phase and syntax analysis phase errors along with error handling schemes. 8

8. Write notes on following :—

   (a) Peephole Optimization 6

   (b) LEX 8

   (c) Register Allocation and Assignment. 6

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