Roll No ....

IT-6004-CBGS

B.E. VI Semester

Examination, December 2020

Choice Based Grading System (CBGS)

Compiler Design

Time : Three Hours

Maximum Marks : 70

Note: i)   Attempt any five questions.

     ii)   All questions carry equal marks.

     iii)   Assume missing data if any, suitably.

1. a)   Compare the features of a single pass compiler with multi-pass compiler.   7

    b)   Briefly explain the compiler construction tools.   7

2. a)   Consider the grammar: 7

$$E \rightarrow 5 \quad T | 3 - T,$$

$$T \rightarrow V | V * V | V + V,$$

$$V \rightarrow a | b.$$

What is the use of left factoring? Find the first and follow for above grammar and do the left factoring for it.

    b)   Describe the following in brief.   7

       i)   Ambiguity

       ii)   Left recursion

       iii) Parse Tree

3. a) Consider the following grammar   7

    $E \rightarrow E+T$

    $T' \rightarrow TF/F$

    $F \rightarrow F*/a/b$

    Construct the SLR Parsing table for this grammar.

  b) Construct the predictive parser for the following grammar: 7

    $S \rightarrow (L)/a$

    $L \rightarrow L,S/S$

4. a) Write the grammar and syntax directed definitions for a simple desk calculator and show annotated parse tree for the expression: $(3+4) * (5+6)$.   7

  b) With an example, explain the various formats of intermediate code.   7

5. a) What are the features and capabilities of the symbol table?

                                     7

  b) What is an activation record? Explain the purpose of different fields in an activation record.   7

6. a) Write an algorithm to construct a DAG from a basic block.

                                     7

  b) Generate the three-address code for the following code segment:

    While (a < c and b < d) do

    If a = l then c = c + 1;

    Else

    While (a < = d) do

    a = a + 3;   7

7. a) Explain the common sub expression elimination, copy propagation and transformation for moving loop invariant computations in details.   7

    b) Explain the peephole optimization.   7

8. Write short notes on following.(any three)   14
    a) Lexical analysis
    b) Canonical items
    c) Back patching
    d) L-attributes and S-attributes

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