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Roll No .....

IT-6004-CBGS

B.E. VI Semester

Examination, June 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.

1. a) Write down the output of each phase for the expression position: = initial + rate*60 . 7

   b) Define cross compilation and explain the process of bootstrapping. 7

2. a) Explain the role of lexical analyzer and write in detail about input buffering. 7

   b) Consider the following grammar: 7

   S 0A|1B|0|1, A 0S|1B|1, B 0A|1S

   construct leftmost derivations and parse trees for the following sentences

   i) 0101

   ii) 1100101

3. a) Obtain the predictive parsing table for the following grammar: 7

   $S \rightarrow iEtSS' \mid a;$

   $S' \rightarrow eS \mid \varepsilon;$

   $E \rightarrow b$

   b) Construct LL (1) parsing table for the following grammar:

   $S \rightarrow iCtS \mid iCtSeS \mid a;$

   $C \rightarrow b$

   Is the grammar is LL (1)? 7

4. a) What is FIRST and FOLLOW? Write the algorithm for FIRST and FOLLOW. 7

   b) Consider the grammar

   $E \rightarrow TE^1$

   $E^1 \rightarrow +E/\varepsilon$

   $T \rightarrow FT^1$

   $T^1 \rightarrow T/\varepsilon$

   $F \rightarrow PF^1$

   $F^1 \rightarrow *F^1/\varepsilon$

   $P \rightarrow (E)/a/b/\varepsilon$

   Compute FIRST and FOLLOW. 7

5. a) Give the syntax-directed definition for if-else statement. 7

   b) How Back patching can be used the generate code for Boolean expression and flow of control statements. 7

6. a) Explain in detail the translation of assignment statements. 7

   b) Discuss about the run time storage management. 7

7. a) What is a three address code? Mention its types. How would you implement the three address statements? Explain with examples. 7

   b) Explain DAG representation of the basic blocks with an example. 7

8. a) Explain the principle sources of code optimization in detail. 7

   b) Define the following: 7

      i) Code motion

      ii) Peephole optimization

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