Roll No .....

CS-7002 (CBGS)

B.E. VII Semester

Examination, November 2019

Choice Based Grading System (CBGS)

Compiler Design

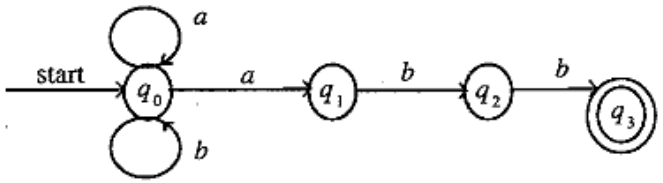
Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.
iii) Part (a) and (b) of the question selected is to be solved.

1. a) Explain different phases of compiler.
   b) Explain the role and function of the lexical analyzer. What are the main issues in design of lexical analyzer?

2. a) Obtain a DFA equivalent to the NFA given:



   b) Differentiate between NFA and DFA under following points:
   Power, Transition function, Time complexity, Supremacy, Transition Diagram and Transition Table.

3. a) Differentiate between Top Down Parsing (Predictive Parsing) and Bottom Up Parsing (Shift Reduce Parsing).
   b) Consider the grammar:
   $S \rightarrow aAcBc$
   $A \rightarrow Ab / b$
   and $B \rightarrow d$
   Shift reduce for the string abbcdc. Define handle and handle pruning.

4. a) Why is it necessary to eliminate left recursion in top down parsing? Consider predictive parsing table for:
   $S \rightarrow (L) / a$
   $L \rightarrow L, s/s$
   b) Differentiate between simple LR parser and canonical LR parser.

5. a) What is the difference between synthesized and inherited attribute? Explain with example.
   b) Explain about the syntax directed translation scheme for the Boolean expression with example.

6. a) What is activation tree? How control stack is maintained with the help of activation tree? Explain with example.
   b) Explain the concept of static, stack and heap allocation.

7. a) Explain the terms basic blocks and flow graphs.
   b) Construct syntax tree and DAG for the following expression.
   $a := b * - c + b * - c$

8. a) Write short notes on:
   i) Global Data Flow Analysis
   ii) Loop Optimization
   b) Explain the concept of dead code elimination.

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