M.Sc. Examination, 2019
Semester-II
Computer Science
Course : MCSC-22
(Compiler Construction)

Time : 3 Hours **Full Marks : 40**

Questions are of value as indicated in the margin

Answer Question No.**1** and **any four** from the rest.

1. a) Distinguish between a compiler and an interpreter.
   b) Draw the transition diagram for a signed constant.
   c) What is a basic block?
   d) What are r-value and *l*-value? 2×4=8
2. a) What are the phases of a compiler? Give an example.
   b) How can an NFA be constructed from a regular expression using Thompson's construction. 4+4=8
3. a) Write the definitions and rules to compute the following
   i) firstpos ii) lastpos iii) followpos iv) nullable
   b) Find the above sets for (a|b)* aba (a|b)*. 4+4=8
4. a) Write the non-recursive predictive passing algorithm.
   b) Consider the following grammar
   E→ E+T|T T→T*F |F F → (E) | id.
   If the input is id + id * id, write the sequence of moves the predictive parser makes. 4+4=8
5. a) What are the importance of viable prefixs?
   b) Find the canonical LR(0) collection for the augmented grammar 2+6=8
   $E' \to E \quad E \to E+T \mid T \quad T \to T*F \mid F \quad F \to (E) \mid id$
6. For the argument statement $a = b*(c-d-e)+c*(-d)$
   a) Draw the syntax tree b) Write the three address codes
   c) Write the quadruples and triples. 2+2+4=8
7. a) Write short notes on i) Dominators and ii) Structure preserving transformations
   b) Draw the DAG for the following set of expressions (3+3)+2=8

   $a = x*y$

   $z = x$

   $b = z*y$

   $x = b$

   $g = x*y$

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