M.Sc. Examination 2018
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. Answer **any four** : 2×4=8
   a) Distinguish between a compiler and an interpreter.
   b) Draw the transition diagram for 'C' identifiers.
   c) What are three-address codes?
   d) What do you mean by left recursive grammar?
   e) What is a recognizer?
2. (a) Writ an algorithm for conversion from NFA to DFA using subset construction method. 4+4=8
   b) Draw the NFA accepting the language (a|b)*ab, and then convert it to its equivalent DFA using the above algorithm.
3. a) What are the different types of errors a program may contain? 2+6=8
   b) What are FIRST and Follow sets? What are the rules to find them?
4. a) Discuss the structure of the LR(k) parser. 3+5=8
   b) Write the LR parsing algorithm.
5. a) Define three-address codes. 1+3+4=8
   b) What are the common three-address codes?
   c) For the assignment statement $a = b*(-c)+c*(-d)$, draw the syntax tree and write the three address codes.
6. a) Consider the following grammar where E is the boolean function to be translated.
   $S \rightarrow$ if E then S_1 | if E then S_1 else S_2 6+2=8
   | while E do S_1
   Write the semantic rules.
   b) What do you mean by common subexpresion elimination?
7. a) What is a basic block? Give an example. 2+3+3=8
   b) Write the algorithm to partition a sequence of three-address statements into basic blocks.
   c) Write expressions for gen [S] and kill [S] (i) a set of two consecutive statements (ii) an if-then-else statement.

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