Roll No. ..... Total Pages : 2

MCAQ/D-21 **24053**

COMPILER DESIGN

Paper–MCA-14-51

Time Allowed : 3 Hours] [Maximum Marks : 80

Note : Attempt **five** questions in all, selecting **one** question from each Unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) Briefly discuss first-pass and multi-pass compilers. 4

   (b) How semantic errors can be detected and recovered? 4

   (c) Compare LR, SLR, LALR parsers. 4

   (d) Explain machine-dependent and independent code generation. 4

UNIT-I

2. (a) What is a compiler? Explain different phases of a compiler. 8

   (b) Describe various compiler construction tools. 8

3. Write a regular expression for a C identifier. Construct a NFA for this expression using Thompson Construction, convert the NFA to a DFA using subset construction and minimize the states in the DFA. 16

UNIT-II

4. (a) What do you understand by three-address code? Explain common three-address statements in use. 8

   (b) What do you understand by symbol table? Also explain list data structure for symbol table and hash table. 8

5. (a) Discuss the run time storage management for implementation of block-structures languages. 10

   (b) Discuss the error recovery in operator-precedence parsing. 6

UNIT-III

6. (a) Discuss top-down and bottom-up parsing. 8

   (b) Write down the procedure for constructing LALR parsing table. 8

7. (a) Write down an algorithm for detecting unreachable entries in a LR parsing table. 8

(b) Construct error-correcting LR parser for the following grammar: 8

stmt → *if* e *then* stmt
| *if* e *then* stmt *else* stmt
| *while* e do stmt
| *begin* list *end*
| s

list → list; stmt
| stmt

UNIT-IV

8. What is Intermediate Code? What is the need for it? Discuss the issues in the design of a code generator. 16

9. (a) Discuss code improving transformation. 8

(b) Write an algorithm to compute RIN and ROUT parameter of a data flow equation for reaching definitions. 8