

**MCA/D11****4563****System Programming and Compiler Construction****Paper : MCA-504**

Time : Three Hours]

[Maximum Marks : 80

**Note :-** Attempt **FIVE** questions in all. Q. No. 1 is compulsory. In addition to the compulsory questions, attempt **FOUR** more questions by selecting **ONE** question from each Unit.

1. Explain the following concepts :-

- (a) Assembler and Macro Processor
- (b) Program Relocatability
- (c) Compiler and LEX
- (d) Parse Tree and DFA
- (e) Parsing Technique and its significance
- (f) LR Parsing Table
- (g) Code Generation and optimization
- (h) Loops in Flow Graphs.

3 each

**UNIT-I**

2. (a) Write down the elements of Assembly Language Programming. 6
- (b) Write a description on :-
- (i) One Pass Assembler
  - (ii) Multi Pass Assembler. 4,4
3. (a) What are the functions of a Macro Processor ? Why it is needed ? 7
- (b) How is Macro Processing carried out within language translator ? 7

## UNIT-II

4. (a) What are the various phases and passes of a Compiler ? 8
- (b) What do you mean by Compiler Construction Tools ? 6
5. (a) Define Finite State Automata with an example. What is the significance of NFA ? 8
- (b) What is meant by BNF notation ? Briefly describe the concept of ambiguity. 6

## UNIT-III

6. (a) Write notes on the following concepts :-
  - (i) Bottom-up Parsing
  - (ii) Predictive Parsing. 5,5
- (b) What do you mean by LR parser ? 4
7. (a) Give a description of Canonical LR parsing table and LALR parsing table. 8
- (b) What do you mean by ambiguous grammar ? Illustrate with an example. 6

## UNIT-IV

8. (a) What are the issues in the design of a code generator ? 6
- (b) Briefly describe the following concepts :-
  - (i) Intermediate code for declarative statement
  - (ii) Intermediate code for assignment statement. 4,4
9. (a) What is the need of Code Optimization ? 7
- (b) Write a note on Code Improving Transformation. 7