

Roll No. ....

Total Pages : 03

**MCA/M-24**

**24523**

COMPILER DESIGN

Paper : MCA-20-24 (iii) Option (iii)

Time : Three Hours]

[Maximum Marks : 75

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

**Compulsory Question**

1. (a) Differentiate between local and global optimization.
- (b) What is a triple ?
- (c) Enlist various types of errors that should be handled by the compiler.
- (d) Enlist the various data structures used in symbol table.
- (e) How bottom-up parsing is different from top-down parsing ?
- (f) What is meant by lexical analysis ? **6×2.5=15**

**Unit I**

2. Explain the structure of a compiler. Discuss working of single-pass and multipass compilers in detail. **15**

3. (a) What is NFA and DFA ? How an NFA can be converted to DFA ? Explain using suitable examples. **7.5**
- (b) Explain the working of a Lexical Analyzer using a small example. **7.5**

### Unit II

4. (a) Write an algorithm for constructing predictive parsing table. **7.5**
- (b) Construct a recursive decent parser starting with the following grammar : **7.5**

$$S \rightarrow + SS \mid - SS \mid a$$

5. (a) Show that the following grammar : **7.5**
- $$S \rightarrow AaAb \mid BbBa$$
- $$A \rightarrow \epsilon$$
- $$B \rightarrow \epsilon$$
- is LL(1) but not SLR(1)
- (b) Write down the procedure for constructing LALR parsing table. **7.5**

### Unit III

6. Explain the various syntax directed translation schemes using suitable examples. **15**

7. (a) How scope information is represented by symbol table ? Explain. **7.5**
- (b) What are the various semantic errors ? How are they handled ? **7.5**

### Unit IV

8. (a) How the postfix notation is handled by the compiler ? Explain. **7.5**
- (b) What is peephole optimization ? Explain in brief. **7.5**
9. What are code improving transformations ? Explain each using suitable examples. **15**