

Roll No.

Total Pages : 03

CMCSQ/D-23

24045

COMPILER DESIGN

MS-20-33(i)

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all. Question Number **1** is compulsory. In addition to compulsory question, attempt *four* more questions, selecting *one* question from each Unit. All questions carry equal marks.

(Compulsory Question)

1. Answer any *five* of the following questions in brief :
 - (i) What is the difference between single-pass and multi-pass compilers ?
 - (ii) What does the regular expression $(b \mid ab^*ab^*)^*$ mean ?
 - (iii) What are parse trees ?
 - (iv) What approach of parsing is adopted by bottom-up parsing techniques ?
 - (v) What do you mean by run time storage ?
 - (vi) List any *two* issues that arise during the code generation phase.

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Unit I

2. What is the significance of the term 'phase' in a compiler ? Describe the structure of a compiler in terms of its various phases and describe the purpose of each phase.
3. (a) What is the role of grammars in compiler construction ? How is context-free grammar defined ? Give example of a context-free grammar.
(b) What is the relationship between lexical analyzer, regular expressions and finite automata ? Describe the importance and give a brief description of each.

Unit II

4. How is parsing carried out using top-down approach ? What are the various types of top-down parsing schemes ? Explain using suitable examples.
5. Illustrate Shift-Reduce parsing using a suitable example. Also distinguish between Recursive-Descent Parser and Operator Precedence parser.

Unit III

6. Why is a symbol table used in compiler design ? Which data structures are most appropriate to create symbol tables and why ?
7. What can be the sources of errors in a program ? Illustrate using examples, the kind of syntactic errors and lexical-phase errors.

Unit IV

8. Describe the reason for the need of an intermediate code. What are the different ways in which intermediate code can be represented and what are their benefits ?
9. Give a brief overview of the following in the context of optimization :
 - (a) Basic blocks and flow graphs
 - (b) Local and loop optimization.