(b) Explain the generic code generation algorithm in detail. 4

(c) Write the short note on:

(i) Absolute Machine Language

(ii) Relocatable Machine Language 4

10. (a) Describe the advantages and disadvantages of control/data flow analysis. 5

(b) Briefly describe the concept of code optimization and how it can be used to improve the code. 5

(c) Write the short note on:

(i) Global Optimization

(ii) Loop Optimization 4

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UG/PG ODD SEMESTER EXAMINATION, 2022

COMPUTER SCIENCE

7th Semester /1st Semester

Course No. : MCS-501

(Principles of Compiler Design)

Full Marks : 70

Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

(Answer any five questions, taking one from each unit)

UNIT-I

1. (a) Write the short note on:

(i) Compiler (ii) interpreter (iii) Assembler 4

(b) What do you mean by Lexical Analysis? Describe the architecture of a lexical analyzer in detail. 5

(c) What is syntax analysis? Use a diagram to explain the process of a syntax analyzer in detail. 5

2. (a) What is the difference between a compiler and an interpreter? 5

   (b) Describe the advantages and disadvantages of lexical analysis. 5

   (c) Describe the advantages and disadvantages of syntax analysis. 4

UNIT-II

3. (a) Use an example to demonstrate the working of bottom-up parsing, especially operator precedence parsing. 8

   (b) What do you mean by FIRST ( )? Explain the algorithms for computing FIRST ( ) of grammar symbols with an example. 6

4. (a) What is the difference between a FIRST() and a FOLLOW ( )? 5

   (b) Explain context-free grammar (CFG) in detail. 5

   (c) Give a detailed explanation of the parse tree. 4

UNIT-III

5. (a) What is a symbol table? Describe the advantages and disadvantages of the symbol table. 8

   (b) Differentiate between static and dynamic storage memory allocations. 6

6. (a) Write the short note on: 8

   (i) Static allocation (ii) Dynamic allocation
   (iii) Complete allocation (iv) Heap allocation

   (b) Describe the stack allocation strategy of the runtime environment with an example. 6

UNIT-IV

7. (a) What is intermediate code generation? Describe the pros and cons of intermediate code generation. 6

   (b) Syntax-directed translation (SDT): what is it? Describe the pros and cons of SDT. 8

8. (a) Explain top-down translation with a suitable example. 5

   (b) Describe syntax-directed definitions (SDDs) in detail. 4

   (c) Semantic analysis: what is it? Describe the semantic analysis phase in detail. 5

UNIT - V

9. (a) What is DAG? Explain the applications of DAG in detail. 6