Roll No. ..... Total Pages : 3

BT-6/M-21 **46165**

COMPILER DESIGN

Paper–PC-CS-302A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *five* questions in all, selecting at least *one* question from each unit. All questions carry equal marks.

UNIT–I

1. (a) Describe in brief the tasks performed at various phases of a compiler.

(b) What is the purpose of compiler construction tools? Describe some commonly used compiler construction tools.

2. What is a regular expression? How are the terms 'regular expression' and 'finite automata' related? What is the significance of regular expression in Lexical Analysis phase? Write the regular expression for a set of strings consisting of even number of a's followed by odd number of *b*'s. Construct NFA for the above regular expression.

UNIT–II

3. (a) What is the importance of a parser in Compiler? What is the role of abstract syntax trees in parsing?

(b) Define context free grammar and its relationship with parsing using a suitable example. When is a grammar said to be ambiguous?

4. What are the different types of Top-down parsing techniques? Bring out the distinction between shift-reduce parsing and recursive descent parsing.

UNIT–III

5. Why is three-address code preferred in compilers? What do you mean by the quadruple and triple representation of three-address code? Explain using suitable examples.

6. Answer the following in brief in the context of symbol table :

(a) What is the information contained in a symbol table?

(b) Describe the commonly used data structures to create symbol tables.

(c) How is the symbol table manipulated at various phases of compilation?

UNIT–IV

7. Answer the following questions in brief :

(a) Distinguish between Machine dependent and Machine independent optimization.

(b) What are the various constructs in a program that act as basic blocks?

(c) How does heap allocation manage run time storage requirement?

8. How does peephole optimization transform source code into an optimized code? Also describe the kind of optimizations that can be performed in a loop.