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BT/D-17 **37023**

COMPILER DESIGN

Paper : IT-455

Time : Three Hours] [Maximum Marks : 75

Note : Attempt any *five* questions. All questions carry equal marks.

1. Illustrate diagrammatically the structure of a compiler depicting the various stages involved in the functionality of a compiler. Also describe the tasks performed at each stage of the compiler.

2. What is the relationship between the terms 'regular expression' and 'finite automata'? What does the regular expression (a|b)*abb mean? How is a Deterministic Finite Automata constructed from a Non-Deterministic one? Construct NFA for the above regular expression and convert it into DFA.

3. What is the function of a parser? What is recursive descent parsing? How is shift-reduce parsing different from recursive descent parsing?

4. When and why is an intermediate code generated? Give examples of any *three* kinds of intermediate codes.

5. Discuss the importance of symbol table in compiler construction. How is a symbol table manipulated at various phases of compilation?

6. What do you mean by runtime storage allocation? What is the role of activation record and stack in runtime storage allocation?

7. (a) Distinguish between syntactic, semantic and dynamic errors. Give an example of a mistake that can lead to a lexical error as well as a syntactic and semantic error.

   (b) Discuss the commonly used loop optimization techniques.

8. (a) How are basic blocks represented using DAG's ?

   (b) Describe a register allocation scheme based on graph coloring.
