6/H–73 (viii) (a) (Syllabus–2015)

2018

(April)

COMPUTER SCIENCE

(Honours)

(Compiler Design)

(CS-602 AT)

Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **one** question from each Unit

UNIT—I

1. (a) What is a compiler? How is it different from an interpreter? 4+2=6

   (b) What is the use of regular expressions? Provide the rules that define regular expressions. 2+7=9

2. (a) Name the various phases of a compiler. Briefly explain the first two phases. 4+6=10

(Turn Over)

(b) What do you understand by finite automata? Differentiate between non-deterministic finite automata (NFA) and deterministic finite automata (DFA). 2+3

UNIT—II

3. (a) Differentiate between left derivation and right derivation.

(b) What is an ambiguous grammar?

(c) What is left recursion? How can it be eliminated? 4+4=

4. Define a handle. Explain the concept of shift reduce parsing. 5+10=1

UNIT—III

5. (a) Differentiate between static checking and dynamic checking. What are the advantages of static checking and dynamic checking? 2+2+2=

(b) What is the associated information stored in a symbol table for an identifier? How is this information used during error detection? 5+4=9

6. (a) What do you understand by type conversion? 5

(b) Describe any two data structures that can be used to represent a symbol table. 10

UNIT—IV

7. (a) What is a runtime environment? Give four advantages of an intermediate code over direct code generation. 2+6=8

(b) Briefly explain the contents stored in an activation record. 7

8. (a) Describe in brief *Abstract Syntax Trees* and *Directed Acyclic Graphs*. 6

(b) How is a *quadruple* used to implement three-address instructions? Give an example. 6+3=9

UNIT—V

9. (a) Name and describe three factors that can affect code generation. 6

(b) Explain the following code optimization techniques : 3+3+3=9

(i) Compile-time evaluation

(ii) Common sub-expression elimination

(iii) Strength reduction

10. *(a)* What is a 'basic block'? How are they constructed? 2+5=

(b) Describe how a *Directed Acyclic Graph* (DAG) can be used to represent basic blocks. 8

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