Roll No. .....

(05/25)

14334

B.C.A. EXAMINATION

(For Batch 2021 & Onwards)

(Fourth Semester)

PROGRAMMING LANGUAGE

BCA-44

Time : Three Hours *Maximum Marks : 80*

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. Attempt following parts :

   (a) Describe the spectrum of programming languages.

   (b) Explain lexical analysis and its role in compilation process.

(c) Explain the purpose of a finite automaton in scanning phase.

(d) What is the difference between top-down and bottom-up parsing ?

(e) What is binding time and why is it important in programming languages ?

(f) Explain the role of symbol tables in implementing scope.

(g) Explain the role of the semantic analyzer in the compilation process.

(h) Describe the relationship between syntax trees and semantic analysis.

Unit I

2. Discuss the taxonomy of programming languages. Explain the importance of a programmer's understanding of languages belonging to different paradigms. Illustrate with examples.

3. Explain the lexical analysis and syntax analysis phases of the compilation process. Relate these phases to scanning and parsing. Also discuss various approaches to parsing.

Unit II

4. Discuss the role of regular expressions and context-free grammars in specifying programming language syntax. Illustrate their use in defining the structure of a programming language.

5. Describe the differences between recursive descent parsing, table-driven top-down parsing and bottom-up parsing. What are the advantages and limitations of each parsing method ?

Unit III

6. Discuss various methods of object lifetime, scope and storage management in programming languages. Also discuss static allocation, stack-based allocation, heap-based allocation and garbage collection.

7. Discuss the concepts of overloading, polymorphism and aliases in programming languages. How do these concepts contribute to the flexibility and expressiveness of a language ? Illustrate with example.

Unit IV

8. Describe the process of evaluating attributes and errors encountered during semantic analysis. What challenges are faced in attribute evaluation and how are they addressed ?

9. Describe various approaches to space management for attributes in semantic analysis and impact these approaches on efficiency and accuracy of the semantic analysis process.

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