Printed Page:-03 **Subject Code:- BBCA0105**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

MCA

SEM: I - THEORY EXAMINATION (2024-2025)

Subject: Principles of Programming Language

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* ***three Sections -A, B, & C.*** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION-A 20

1. Attempt all parts:-

1-a. Which paradigm focuses on sequential commands to achieve a goal? (CO1, K2) 1

(a) Object-oriented
(b) Imperative
(c) Functional
(d) Logic

1-b. What is the purpose of a parse tree? (CO1, K1) 1

(a) Check Errors
(b) Represent Syntax Structure
(c) Optimize Code
(d) Store Variables

1-c. Which keyword is used for defining constants in C++? (CO2, K1) 1

(a) static
(b) const
(c) final
(d) constant

1-d. The default value of a union member is: (CO2, K2) 1

(a) Zero
(b) Null
(c) Undefined

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(d) One

1-e. In dynamic scoping, a variable is resolved by: (CO3, K2) 1

(a) Declaration order
(b) Function call chain
(c) Compilation process
(d) Type of variable

1-f. Generic subprograms are primarily used for: (CO3, K2) 1

(a) Code optimization
(b) Type independence
(c) Debugging
(d) Performance testing

1-g. The feature which supports encapsulation in ADTs: (CO4, K2) 1

(a) Inheritance
(b) Polymorphism
(c) Encapsulation
(d) Abstraction

1-h. Static storage management is used for: (CO4, K2) 1

(a) Temporary variables
(b) Global variables
(c) Local variables
(d) Dynamic allocation

1-i. An exception propagation is defined as: (CO5, K3) 1

(a) Moving an exception to another class
(b) Passing an exception to the calling method
(c) Logging exceptions in a file
(d) None of the above

1-j. The purpose of 4GL is defined as: (CO5, K2) 1

(a) Low-level hardware programming
(b) GUI-based development
(c) Easier database manipulation
(d) System-level programming

2. Attempt all parts:-

2.a. Define lexical analysis . (CO1, K1) 2

2.b. How does user-defined data types differ from primitive data types? (CO2, K2) 2

2.c. The primary disadvantage of dynamic typing: (CO3, K2) 2

2.d. List the application of Concurrency. (CO4, K3) 2

2.e. Explain the unchecked exception in Java. (CO5, K2) 2

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SECTION-B 30

3. Answer any five of the following:-

3-a.	Explain different programming categories. (CO1, K2)	6
3-b.	Define virtual machines and explain their importance in programming. (CO1, K2)	6
3-c.	Discuss the differences between primitive, user-defined, and reference data types, providing examples. (CO2, K3)	6
3-d.	Describe pointers and references, focusing on their differences and applications in programming. (CO2, K3)	6
3.e.	Compare and contrast static scope and dynamic scope in terms of their implementation and practical applications. (CO3, K3)	6
3.f.	Describe the differences between stack and heap memory allocation. (CO4, K2)	6
3.g.	Explain the concept of backtracking in Prolog with an example query. (CO5, K3)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Explain Programming paradigms in details. (CO1, K1)	10
4-b.	Describe the architecture of a virtual machine and its role in programming language implementation. (CO1, K2)	10

5. Answer any one of the following:-

5-a.	Explain the structure, advantages, and limitations of arrays. (CO2, K2)	10
5-b.	Discuss pointers and references, their differences, and how they are used in dynamic memory management. (CO2, K3)	10

6. Answer any one of the following:-

6-a.	What are overloaded subprograms? How do they contribute to code flexibility and reusability? Provide relevant examples. (CO3, K3)	10
6-b.	Explain lifetime and scope of a variable. (CO3, K2)	10

7. Answer any one of the following:-

7-a.	Discuss the advantages and disadvantages of stack-based storage management. (CO4, K2)	10
7-b.	Define heap memory. Explain its role in dynamic memory allocation with an example. (CO4, K3)	10

8. Answer any one of the following:-

8-a.	Write a C++ program to demonstrate multiple catch blocks and explain how they work. (CO5, K3)	10
8-b.	Compare functional programming with procedural and object-oriented programming paradigms. Highlight key advantages and disadvantages. (CO5, K3)	10

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