PAPER ID-310314

Roll No:

BCA

(SEM III) THEORY EXAMINATION 2025-26

OBJECT ORIENTED PROGRAMMING IN C++

TIME: 3 HRS **M.MARKS: 70**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 07 = 14**

Q no.	Question
a.	Discuss why Object Oriented Programming emerged as a solution to problems faced in large scale software systems built using procedural paradigms like C.
b.	Compare C and C++ as programming languages.
c.	Explain how C++ classes help in implementing Abstract Data Types.
d.	Describe the structure of a C++ class declaration.
e.	Differentiate between public, private, and protected inheritance.
f.	What is Generic Programming?
g.	Describe the purpose of input and output stream classes.

SECTION B

2. Attempt any *three* of the following: **7 x 3 = 21**

a.	Explain the Object Oriented Approach to software development. How does it differ in philosophy and structure from functional programming and data decomposition approaches?
b.	Explain the concept of Encapsulation and Information Hiding. Why are they considered fundamental principles of object oriented design?
c.	Explain inheritance in C++. How does it promote code reusability and extensibility? Illustrate with a suitable class hierarchy.
d.	Explain class templates with multiple parameters.
e.	Discuss disk file input output operations using streams. Explain file pointers and the modes used while opening files.

SECTION C

3. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Define and explain the basic concepts of Object Oriented Programming: Class, Object, Abstraction, Encapsulation, Inheritance, and Polymorphism. Use real world analogies to justify each concept.
b.	Explain the role of cin and cout in C++. How do they differ from scanf and printf in C in terms of type safety and extensibility?

4. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Explain constructors and destructors in C++. Discuss their purpose, types, and the order in which they are invoked during object creation and destruction.
b.	Design a C++ class BankAccount with attributes account number and balance. Implement constructors, a destructor, and methods for deposit and withdrawal. Demonstrate object instantiation and method invocation.

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5. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Distinguish between aggregation and composition. Compare composition versus classification hierarchies with real world examples.
b.	Write a C++ program demonstrating method overriding using base and derived classes. Use virtual functions to show runtime polymorphism.

6. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Describe function templates and function templates with multiple parameters. How does template instantiation take place in C++?
b.	Explain overloading of template functions. How does the compiler resolve ambiguity between overloaded template and non template functions?

7. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Explain the exception handling mechanism in C++. Describe the use of try, throw, and catch blocks and the importance of multiple catch statements.
b.	Write a C++ program that reads data from a file. Handle possible file opening errors using exception handling and demonstrate the use of multiple catch blocks.