(Please write your Exam Roll No.) *Exam Roll No. .....*

END TERM EXAMINATION

THIRD SEMESTER [B.TECH] DECEMBER-2025

Paper Code: CIC-211 ***Subject: Object-Oriented Programming Using C++***

Time: 3 Hours **Maximum Marks: 60**

Note: Attempt any five questions including Q.no.1 which is compulsory. Select one question from each unit.

Q1 Attempt **any five** **(4x5=20)**

(a) Define the Object-Oriented Programming (OOP) paradigm.

(b) Discuss the evolution of C++ from the C programming language.

(c) Explain the significance of member functions in encapsulation and abstraction.

(d) What is access specifier? Explain with the help of suitable example.

(e) What are the difference between data type and abstract data type? Give example.

(f) Explain the concept of virtual functions and their role in achieving runtime polymorphism.

(g) Define iterators and their significance in the STL.

UNIT-I

Q2 (a) What is function prototyping? Why is it used in C++? Justify. **(3)**

(b) Define inline functions in C++. **(3)**

(c) Discuss the concepts of call by reference and return by reference in C++. How do these concepts differ from call by value? **(4)**

Q3 (a) Write a program to find the greatest of two given numbers in two different classes using friend function. **(4)**

(b) Discuss how C++ supports encapsulation, information hiding, inheritance, and polymorphism. Provide examples to support your explanation. **(6)**

UNIT-II

Q4 (a) Explain Default constructor, Parameterized constructor, Dynamic constructor and Copy constructor with an example. **(7)**

(b) What is operator overloading? Implement a class string containing the following functions: **(3)**

(i) Overload + operator to carry out the concatenation of strings.

(ii) Overload = operator to carry out string copy.

(iii) Overload <= operator to carry out the comparison of strings.

P.T.O.

Q5 (a) What is the purpose of specifying a class in C++? How does a class declaration differ from a class definition? **(4)**

(b) How does encapsulation contribute to the concept of abstract data types? Also, discuss the purpose and significance of a destructor. **(3)**

(c) Explain the following terms: Garbage collection. **(3)**

UNIT-III

Q6 (a) Explain types of inheritance in detail. Explain Hybrid inheritance with a suitable program/example. **(7)**

(b) Explain the advantages and limitations of each Inheritance method. **(3)**

Q7 (a) What do you mean by polymorphism? Explain various types of polymorphism with suitable example. **(6)**

(b) How does function overriding contribute to polymorphism? **(4)**

UNIT-IV

Q8 (a) What are containers in the STL? Describe the various components of Standard Template Library in detail.

(b) Explain the persistent objects and multiple inheritance in C++.

Q9 Write short note on following **(any two)**: **(5+5=10)**

(a) Exception handling in OOP

(b) Containers

(c) Vectors

(d) Streams

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