2055
B.E. (Information Technology)
Second Semester
ITC-201: Object Oriented Programming Using C++

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt <u>five</u> questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Answer the following questions concisely:-

a) How does abstraction differ from encapsulation in Object-Oriented Programming?

b) What is the role of scope resolution operator (::) in C++?

c) How does dynamic initialization help in improving program efficiency?

d) Can a constructor be declared as virtual? Justify your answer.

e) Explain the significance of memory allocation for objects of a class.

f) What is the difference between operator overloading and function overloading?

g) What is the difference between hierarchical and hybrid inheritance?

h) What happens if a base class destructor is not declared virtual in an inheritance hierarchy?

i) How does exception handling in C++ differ from traditional error-handling mechanisms?

j) What is the purpose of function templates? How do they improve code reusability?

(10x1)

UNIT - I

II. Object-Oriented Programming allows code reuse and modularity. Discuss in detail how OOP concepts like inheritance and polymorphism support these principles with relevant examples. (10)

III. Write a C++ program to implement a class that simulates a dynamic stack. Use appropriate constructors and destructors to manage memory allocation efficiently. (10)

P.T.O.

IV. C++ allows function overloading and operator overloading. Explain how these two features contribute to polymorphism. Write a program demonstrating operator overloading for the + operator in a user-defined class.   (10)

UNIT - II

V. Differentiate between shallow copy and deep copy in C++. Why is a copy constructor necessary in some cases? Write a program to demonstrate deep copy implementation in C++.   (10)

VI. Explain how virtual functions are implemented internally in C++. What is the significance of the virtual table (vtable) and virtual pointer (vptr)?   (10)

VII. What are function objects in C++? How do they improve the efficiency of STL algorithms? Write a program using function objects in the Standard Template Library (STL).   (10)

x-x-x