

2056

B.Sc. (Hons.) Bio-Informatics (FYUP)

Fourth Semester

BIFD-402: Programming Language C++

Time allowed: 3 Hours

Max. Marks: 60

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

x-x-x

1.
 - a) What are the main features of OOP
 - b) Define class and object with example.
 - c) What is information hiding?
 - d) Explain function overloading vs operator overloading (one difference).
 - e) What is a reference variable?
 - f) What is the role of inline functions?
 - g) Define multilevel inheritance.
 - h) What is a virtual function?
 - i) Explain the purpose of the this pointer.
 - j) What is a constructor overloading?
 - k) What are template classes?
 - l) What is exception handling and why is it needed?

(12x1)

UNIT - I

2.
 - a) Explain the advantages of OOP over structured programming with real-world examples.
 - b) Design a Student Management System class in C++:

- Data members: name, roll number, marks
- Member functions: input(), calculateGrade(), display()

(2x6)

Explain how abstraction and encapsulation are applied.

3.
 - a) Explain inheritance, polymorphism, abstraction, and encapsulation with examples
 - b) Write a C++ program to demonstrate function overloading for:
 - Adding two integers
 - Adding two floating-point numbers
 - Adding three integers

(2x6)

4.
 - a) Explain the concept of:
 - Access specifiers (public, private, protected)
 - Friend function and friend class
 - Inline function
 - b) Write a C++ program to demonstrate operator overloading for:
 - Overloading "==" operator to compare two objects

(2x6)

P.T.O.

(2)

UNIT - II

5. a) Differentiate between:
- Compile-time polymorphism
 - Run-time polymorphism
- With suitable examples.
- b) Write a C++ program using: (2x6)
- Virtual function
 - Demonstrate runtime polymorphism using base class pointer
6. a) Write a C++ program that:
- Uses constructors (default + parameterized)
 - Demonstrates recursion (factorial or Fibonacci)
 - Uses multidimensional array (2D or 3D)
- b) Develop a program to:
- Perform file handling (read/write text file)
 - Use exception handling for file errors
 - Explain difference between text and binary files
- (2x6)
7. a) Explain different types of inheritance:
- Single
 - Multiple
 - Hierarchical
 - Hybrid
- With suitable diagrams.
- b) Write a C++ program demonstrating multiple inheritance and explain how ambiguity can arise. (2x6)

x-x-x