**B.Sc. (Computer Science)**

**(MPCs, MZCs, BZCs)**

**2nd Year 2nd Semester**

**Programming in C++**

## Unit-1

1. Explain searching and sorting an array? Demonstrate with example program.
2. Explain inline function with a program.
3. Explain function overloading with an example program.
4. Define reference variable. Explain with an example program.
5. Explain call by value and call by reference. Write a program to demonstrate each of them.
6. What is default argument? Demonstrate with an example program.
7. Explain in detail datatypes in C++.
8. Explain control statements with syntax and example program.
9. Differentiate between POP and OOP.
10. Give benefits and applications of OOPs.

## Unit-2

1. List and explain the concepts (characteristic) of OOP in detail.
2. Define and explain class and object with syntax. What is the need of private member function? Explain.
3. Explain inline member function with an example program.
4. Write a program to read and display student rollno, name and course using class and object.
5. What is constructor and destructor? Explain with syntax and example program.
6. What is contractor overloading? Explain with an example.
7. Explain public, protected and private access specifier of a class.
8. Write a program to implement binary operator overloading for binary + and binary -.
9. What is operator overloading? Write a program to overload unary operator.
10. Explain instance and static members of a class with an example program.
11. Explain friend function and friend class with an example program.
12. Explain default constructor with an example program.
13. Explain parameterized constructor with an example program.
14. Explain copy constructor with an example program.
15. Write a program to implement 3 constructors (default, parameterized, copy) in a single class.
16. What is aggregation? Write a program to implement it.

## Unit-3

1. Define inheritance. Explain different types of inheritance with syntax and example program.
2. Explain single inheritance with an example program.
3. Implement multiple inheritance with an example program.

4. Explain multilevel inheritance. Write a program to implement it.
5. Explain the order of constructor and destructor in inheritance.
6. Explain the visibility of base class members when inherited in public, private and protected mode.
7. Explain overriding with an example program.
8. Differentiate between function overloading and function overriding.
9. Explain pointers to derived type.
10. What is polymorphism? Explain different types of polymorphism with example programs.
11. What is virtual function? List out rules associated with virtual functions.
12. Define pure virtual function. Write a program.
13. Define abstract base class. Write a program to implement it.
14. Explain new and delete using class and object. Or (Dynamic Memory Allocation)
15. What is stream? Explain formatted and unformatted input/output operations.

## Unit-4

1. Define exception. Explain with try, throw, catch. List out built-in exceptions.
2. Explain about catching multiple exceptions with suitable program.
3. Write about object oriented exception handling using classes.
4. Write a program to implement re-throwing an exception**. Or** nested try-catch.
5. Write a program to extract data from exception base class.
6. Define template. Explain function template and class template with syntax and program.
7. Explain and write a program to implement overloading function template.
8. Explain and write a program to implement template inheritance.
9. Explain in detail Standard Template Library (STL).