

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/  
COMMERCIAL PRACTICE, NOVEMBER – 2024**

**OBJECT ORIENTED PROGRAMMING THROUGH C++**

[Maximum marks: 100]

[Time: 3 Hours]

**PART – A**  
**Maximum marks: 10**

**I.** (Answer *all* the questions in one or two sentences. Each question carries **2** marks)

1. Write the syntax for declaring a structure.
2. Write any two advantages of using functions.
3. Can we make an object of a class as member of another class?
4. Define Exception.
5. Specify the use of virtual function.

**(5 x 2 = 10)**

**PART – B**  
**Maximum marks: 30**

**II.** (Answer any *five* of the following questions. Each question carries **6** marks)

1. Develop a C++ program to generate the following pattern using for loops.

```
*  
  
*   *   *  
  
*   *   *   *   *
```

2. Describe any two methods to create user defined data types in C++.
3. Explain any two parameter passing methods in C++ with suitable example.
4. Write the syntax for creating a class in C++. Create a sample class and list data members, member functions and visibility controls.
5. Differentiate public, private and protected inheritance.
6. With suitable example explain how to overload unary operator.
7. Explain exception handling in C++ using throw-catch mechanism.

**(5 x 6= 30)**

**PART – C**  
**Maximum marks: 60**

(Answer *one full* question from each unit. Each full question carries **15** marks)

**UNIT – I**

- III.** (a) Write a C++ program to find the sum of odd integers in an array. (9)
- (b) Write the syntax of any two looping control structures in C++. (6)

**OR**

- IV.** (a) Write a note on different storage classes. (8)
- (b) Write a C++ program to store and display the following details of  $n$  students in an array of structures. (7)
- (i) Student ID (ii) Program ID (iii) CGPA upto current semester

**UNIT – II**

- V.** (a) Write a C++ program to find the area of circle and rectangle using the concept of function overloading. (8)
- (b) Explain the following object oriented programming concepts. (7)
- (i) Data Encapsulation (ii) Information Hiding

**OR**

- VI.** (a) With suitable examples describe any two kinds of constructors. (8)
- (b) Define friend function. What are the characteristics of friend function? (7)

**UNIT - III**

- VII.** (a) Explain different types of inheritance supported by C++. (8)
- (b) Overload binary + operator using friend function to add two complex numbers. (7)

**OR**

- VIII.** (a) Write a C++ program to read the details of an employee such as ID and Basic Pay using the member function Read\_Data() in base class. Calculate the Gross\_Salary in derived class using the member function Compute\_Salary().  $Gross\_Salary = Basic\_Pay + DA$  where DA is 30% of Basic\_Pay. Derived class should also contain a function to display all the details of an employee. Use the concept of single inheritance. (9)
- (b) Write any six rules for operator overloading. (6)

**UNIT – IV**

- IX.** (a) With suitable example explain how a base class pointer is used to invoke member function in a derived class. (8)
- (b) Write a program in C++ to implement basic arithmetic operations. Use throw-catch mechanism to handle division by zero exception. (7)

**OR**

- X.** (a) With suitable example explain template class. (8)
- (b) Differentiate virtual function from pure-virtual function. (7)