## MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : BCA-402

# OBJECT ORIENTED PROGRAMMING WITH C++

*Time Allotted* : 3 Hours                    *Full Marks* : 70

*The figures in the margin indicate full marks.*

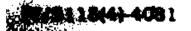*Candidates are required to give their answers in their own words as far as practicable.*

## GROUP – A

### ( Multiple Choice Type Questions )

1. Choose the correct alternatives for any *ten* of the following :                    10 × 1 = 10

   i) Which of the following is not a feature of OOPS ?

      a) Encapsulation

      b) Inheritance

      c) Static Binding

      d) Polymorphism.

   ii) If a class contains at least one pure virtual function then the class is called

      a) Virtual base class

      b) Abstract base class

      c) Both (a) and (b)

      d) None of these.

iii) Which of the following statement is correct ?

    a) Destructor has a default value

    b) Destructor takes an argument

    c) Destructor deallocates memory

    d) None of these.

iv) The argument of a copy constructor is passed by

    a) Value

    b) Reference

    c) Pointer

    d) Both (a) and (b).

v) Operator overloading is an example of

    a) Compile time polymorphism

    b) Run-time polymorphism

    c) Both (a) & (b)

    d) None of these.

vi) Identify if any error is present in defining operation for overloading ++ operator for post-increment using member function : operator++()

    a) parameter should be present

    b) discriminator 'int' should be present

    c) both (a) and (b)

    d) none of these.

vii) Friend function cannot overload ............. operator.

    a)   ++             b)   *

    c)   ==            d)   +

viii) Which of the following class constructors will be invoked first ?

    a)   Virtual Base class

    b)   Base class

    c)   Abstract class

    d)   Derived class.

ix) Which STL component defines how data will be stored ?

    a)   Algorithm         b)   Iterator

    c)   Container         d)   All of these.

x) In private inheritance, public members of the base class become ............... members of the derived class.

    a)   Public           b)   Private

    c)   Protected       d)   None of these.

xi) In declaration class test { int x; }; x is what type of member ?

    a)   Public           b)   Private

    c)   Protected       d)   None of these.

xii) The ambiguity in multiple inheritance can be resolved by

a)  virtual function

b)  function overriding

c)  using scope resolution operator to call member function

d)  both (b) and (c).

## GROUP – B

### ( Short Answer Type Questions )

Answer any *three* of the following.    3 × 5 = 15

2.  Describe with example how run time polymorphism is achieved.

3.  Explain the use of inline function. What are the limitations of inline function ?    3 + 2

4.  How are data members allocated in memory for objects of a class ? Show how 'Static' data members work with an example.    2 + 3

5.  What is the functionality of try, throw and catch statements in exception handling ? What is virtual destructor and why is it used ?    3 + 2

6.  Write a program in C++ to copy the contents of a two-columnar file to another such that the first column is left justified and the second one is right aligned in the output file.

## GROUP – C

### ( Long Answer Type Questions )

Answer any *three* of the following.    $3 \times 15 = 45$

7.  a)  What do you mean by data hiding in C++ ?

    b)  Show array of object with an example.

    c)  Why 'Friend' functions cannot be defined inside a class definition ?

    d)  Write a C++ program to show 'setw' manipulator.

    $$3 + 5 + 3 + 4$$

8.  a)  Write a program in C++ to calculate $a^b$, where if only $a$ is passed to the function, it calculates $a^2$ and if $a$ and $b$ both are passed then it calculates $a^b$.

    b)  Write a program in C++ to demonstrate insert and delete operations in a queue using Standard Template Library. Also display the contents of the queue.

    c)  When does ambiguity occur in multiple inheritance ? How can it be resolved ? Explain with example.    $5 + 5 + 3 + 2$

9    a)    Write a C++ program to overload member function 'area ()' of a class shape to find the area of

        (i)      Circle

        (ii)     Rectangle

        (iii)    Square.

   b)    Define Abstract Class. Why do we need Abstract Base Class ?        ( 3 × 3 ) + ( 3 × 2 )

10.   a)    Design a class 'employee' that contains id, name and salary. Use proper input to initialize values of data members. Create multiple objects of employee. You are also required to count the total number of employees.

   b)    Consider a banking system that consists of class Account with data members Acc No., Name and Balance. Define a member function withdraw () for withdrawal of amount. Write a program in C++ to generate an exception for overlimit withdrawal.

   c)    What is 'casting operator function' ? Show class to class type conversion with 'casting operator function'.        5 + 5 + 5

11. **Write short notes on any *three* of the following .**    3 × 5

    **a)**    **Exception handing**

    **b)**    **Structured programming & object oriented programming**

    **c)**    **Multiple inheritance**

    **d)**    **Derived class constructor**

    **e)**    **Sequential & Random access file**

    **f)**    **Data abstraction & Data hiding.**