Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/MCA/SEM-2/MCA-205/2010

2010

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) Class A : public B, public C

is an example of what kind of inheritance ?

a) Single b) Multiple

c) Hierarchical d) Multilevel.

ii) A friend function can be called

a) by using object of the class

b) should not be called

c) by using the class name

d) directly like normal function.

iii) An object is a/an ..... for a class.

a) template b) friend

c) instance d) none of these.

iv) Consider the following statements :

I. A reference variable provide an alias to a previously defined variable.

II. Friend function can only be declared in the public section.

III. A static member function does not have 'this' pointer.

IV. New operator cannot be overloaded.

Which of the following statements is / are ture ?

a) Only I b) I and III

c) II and III d) II and IV

e) None of these.

v) A pure virtual function is a virtual function with which of the following ?

a) Complex constructors

b) No syntax error

c) No body

d) None of these.

vi) Constructor can be

a) virtual

b) with only return type void

c) generated by default if not provided by the programmer

d) none of these.

vii) What will be the output of the following code ?

```
Class XYZ {  int x;
        Public:        void func ( )   delete this;  }   };
main ( ) {     XYZx;   x.func ( );    }
```

a) runtime error b) compilation error

c) no error d) nothing.

viii) A class A has a member function show ( ). Let obj is an object of A and ptr is a pointer to A. Which of the following is / are valid access statements ?

a) obj.show ( ); b) (* ptr).show ( );

c) ptr –> show ( ); d) all of these.

ix) Which of the following is false ?

a) In C++ no static variable can be member of a union

b) In C++ static member function may not be virtual

c) In C++ a union can have virtual member function

d) All of these.

x) The major goal of inheritance in C++ is to

a) facilitate the conversion of data types

b) hide the details of base class

c) facilitate the reusability of code

d) help modular programming.

xi) In protected derivation, accessibility of base members undergoes which of the following changes in the derived class ?

a) Public becomes protected

b) Public becomes private

c) Protected becomes private

d) Private is not inherited.

xii) .Which is the default access specifier of a structure in C++ ?

a) Private b) Public

c) Protected d) None of these.

GROUP – B

(Short Answer Type Questions)

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

2. a) What is function overriding ? Explain with an example.

   b) How is it different from function overloading ? 3 + 2

3. Differentiate the following :

   a) free ( ) and delete

   b) friend function and static member function.

4. a) What is virtual destructor ? Why is it useful ?

   b) Is it possible to have a virtual constructor ? Explain.

   3 + 2

5. a) What is 'this' pointer ? Write a program to return an object using 'this' pointer.

   b) What is a const member function ? Why is it used ?

   3 + 2

6. a) What is operator overloading ? Mention some rules for overloading operators.

   b) Write a program to overload + and – operators as unary operator. 3 + 2

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) What is template class ? How is it different from class template ? Explain with suitable example.

   b) Write a program to create a template function for Bubble sort.

   c) How is template function advantageous over function overloading ?

   d) Explain data abstraction and data encapsulation.

   3 + 6 + 3 + 3

8. a) Differentiate 'has a' and 'is a' relationship with example.

   b) Write a program in C++ to overload [ ] operator.

   c) Explain the following type conversions with suitable examples :

      i) From basic to user-defined

      ii) From user-defined to basic

      iii) Conversion between objects of two different classes.

   3 + 4 + 8

9. a) Write a program in C++ to modify a student record from a student's database and display the records after modification applying file handling.

   b) What is a friend member function ? Explain citing an example.

   c) Write a program to define a class string and overload = =, > and < operator to compare two String objects.

   7 + 4 + 4

10. a) What do you mean by a default arguments function ? Explain.

    b) What is an inline function ? Mention its advantages and pitfalls.

    c) Explain the visibility of base class members in the derived class. When is the base class inherited as private or public or protected ?

    d) What are the ambiguities that arise in multiple and diamond-shaped inheritance ? How can they be resolved ? 2 + 4 + 5 + 4

11. Write short notes on any *three* of the following : 3 × 5 = 15

    i) STL

    ii) static_cast operator

    iii) Hierarchy of stream classes

    iv) Virtual function

    v) Exception handling.