CS/MCA/SEM-2/MCA-205/2011

2011

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 the following :

$$10 \times 1 = 10$$

   i)   Choose the correct statement regarding static member
         variable :

      a)   Declared inside the class, initialized outside the
            class.

      b)   Need an object to access it.

      c)   Inherited in sub-classes

      d)   Only can be used in static member functions.

2204   [Turn over

ii) **Statement I :** Constructor can be inherited.

Statement II : Destructor can be inherited.

of these statements

a) Both are true

b) Both are false

c) Statement I is true, statement II is false

d) Statement is false, statement II is true.

iii) Overloading is otherwise called as

a) Virtual polymorphism b) Static polymorphism

c) Pseudo-polymorphism d) Inline polymorphism.

iv) Friend function is used for

a) accessing the public member of a class

b) accessing the private member of a class

c) accessing the protected member of a class

d) none of these.

v) Class Dog : public *X*, public *Y* is an instance of

a) Multiple inheritance

b) Repeated inheritance

c) Multilevel inheritance

d) Hierarchical inheritance.

vi) The compiler identifies a virtual function to be pure

    a) by the presence of the keyword pure

    b) by its location in the program

    c) if it is equated to 0

    d) none of these.

vii) If a method is an interface between outside world and a class, it has to be declared

    a) Private   d) Protected

    c) Public   d) External

viii) A constructor is called whenever

    a) an object is used   b) an object is declared

    c) a class is declared   d) a class is used.

ix) Private member of the super-class

    a) is both extended as well as accessed inside sub-class

    b) is extended but cannot be accessed inside sub-class

    c) is not extended but can be accessed inside sub-class

    d) is not both extended as well as accessed inside sub-class.

x) Which operator frees memory previously allocated using new ?

    a) Free   b) Delete

    c) Malloc   d) none of these.

GROUP – B

(Short Answer Type Questions)
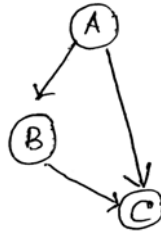
Answer any *three* of the following.   3 × 5 = 15

2. What is the significance of "this" pointer ? Suggest an example to explain inline and outline member functions of a class.   2 + 3

3. What is function overloading ? Write a program to calculate the areas of Triangle, Rectangle and Circle.   1 + 4

4. What is static function ? Write a small program to illustrate the same.   2 + 3

5. Write a program to implement a class "STRING" for string manipulation. Overladd "+" operator for concatenation of two strings.

6. How would you create space for an array of objects using pointer ? Give example.

GROUP – C

(Long Answer Type Questions)

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

7. a) What is the relation between a Class and an Object ? Justify if it is possible to have an object of more than one distinct classes.   2 + 2

    b) What is the importance of a constructor ? What is a copy constructor ? Explain. What do you mean by constructor overloading ? Explain with an example. Is it possible to have virtual constructor ? Justify.

                                        2 + 2 + 2 + 2

    c) Justify or falsify – "Declaration of a constructor must be accompanied by that of a destructor".   3

8. Let $X \rightarrow Y$ indicates that class *Y* is inherited from closs *X*.

    a) Consider the following situation :

       If there is a function declaration f ( ) with return type void within class *A* only, then which version of f ( ) is inherited by *C* ? That of *B* or that of *A* ? Provide necessary justification.   3

b) What is an abstract class ? Explain, with an example, how it is declared. 1 + 2

c) How is a pure virtual function different from virtual function ? 2 + 2

d) Justify if it is possible to declare a constructor having arguments passed as template ? What is parameterized constructor ? 2 + 1

e) Can we have constructor overriding ? Explain. 2

9. a) Explain (i) manipulator (ii) containership. 2 + 2

b) Distinguish multiple inheritance from multilevel inheritance with suitable examples. 3

c) What is polymorphism ? Differentiate between early binding and late binding. 1 + 2

d) Is it possible to realise late binding of an operator on a user defined class ? Justify. 2

e) Define a class "COMPLEX" of complex numbers. Overload the operator "+" to be used for addition of two objects of COMPLEX. 3

10. a) How can we distinguish between prefix and postfix nature while overloading the unary ++ operator ? Give example. 6

b) Why are cin and cont not considered as keywords ? Explain the role of streams in C++. 2 + 2

c) What is exception handling ? What is its use ? Explain with examples. 1 + 2 + 2

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

a) ADT

b) Encapsulation

c) Namespace

d) Friend function

e) Scope resolution.