Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/B.Tech (ICE)/SEM-5/IC-502/2010-11
2010-11
OBJECT ORIENTED PROGRAMMING & DESIGN

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.

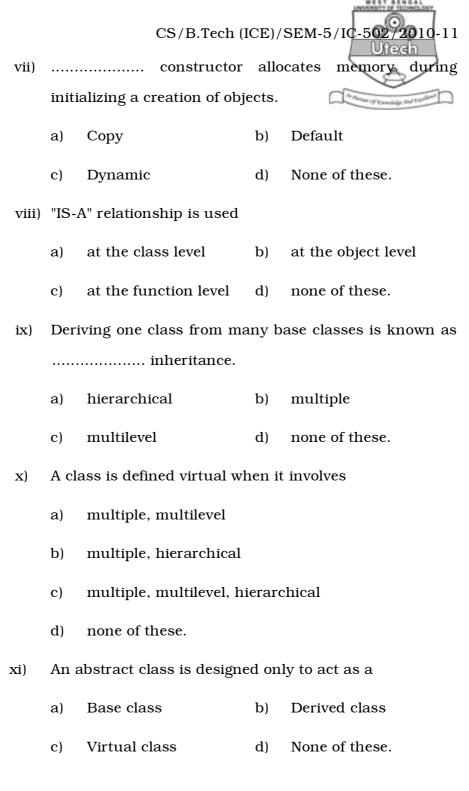### GROUP – A
(Multiple Choice Type Questions)

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

    i)   The operator that cannot be overloaded is

        a) Size-of   b) Relational

        c) Assignment   d) Arithmetic.

    ii) The non-member function that is granted access to class's private members is

        a) virtual function

        b) virtual base function

        c) friend function

        d) none of these.

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iii)   Virtual function uses

    a)   early binding   b)   late binding

    c)   virtual binding   d)   none of these.

iv)   In C++ language 'cout' and 'cin' are

    a)   classes

    b)   functions

    c)   objects

    d)   operators

    e)   streams.

v)   By default, the members of a class are

    a)   private

    b)   public

    c)   both private and public

    d)   cannot say.

vi)   A constructor which can accept a reference to its own as parameter, is called

    a)   Parameterized constructor

    b)   Copy constructor

    c)   Dynamic constructor

    d)   None of these.

vii) .... constructor allocates memory during initializing a creation of objects.

a) Copy   b) Default

c) Dynamic   d) None of these.

viii) "IS-A" relationship is used

a) at the class level   b) at the object level

c) at the function level   d) none of these.

ix) Deriving one class from many base classes is known as .... inheritance.

a) hierarchical   b) multiple

c) multilevel   d) none of these.

x) A class is defined virtual when it involves

a) multiple, multilevel

b) multiple, hierarchical

c) multiple, multilevel, hierarchical

d) none of these.

xi) An abstract class is designed only to act as a

a) Base class   b) Derived class

c) Virtual class   d) None of these.

GROUP – B

(Short Answer Type Questions)

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

2. What do you mean by overloading of constructors ? What is copy constructor ? 3 + 2

3. Describe various types of inheritance with examples.

4. What is pointer ? What are the features of using pointers ? 2 + 3

5. Write a program to define classes *A*, *B* and *C*. The class *C* is derived from *A* and *B*. Define count( ) member function in all the classes as virtual. Count number of objects is created.

6. What is polymorphism ? What are the abstract classes ? 3 + 2

GROUP – C

(Long Answer Type Questions)

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

7. a) What is bit field ? How will it be declared ? 1 + 2

    b) What are the manipulators in *C++* ? 3

    c) What are the identifiers, variables and constants ? 3

d) What is dynamic initialization ? What are the type modifiers ? $1 + 2$

e) Explain type casting. What is explicit and implicit type casting ? $1 + 2$

8. a) The sum of the square of the first n natural numbers is calculated by the formula sum $= n(n+1) * (2n+1)/6$. Read value of n through the keyboard and calculate the sum of square of first n natural numbers. 4

b) What do you mean by function prototype ? 3

c) What is inline function ? Discuss its advantages and disadvantages. $2 + 2$

d) What is the difference between call by value and call by reference ? $2 + 2$

9. a) What is function overloading ? Give an example. 3

b) Write a program to enter quantity and rate through the keyboard. Calculate the amount by multiplying quantity and rate. If the fractional part of the amount is greater or equal to 0·50 then round up the number otherwise round down the number. Enter 10 records. 4

c) What is the difference between public, private and protected variables and functions ?   4

d) What are friend function and friend classes ? Explain it.   4

10. a) What is the difference between local and global functions and variables ?   3

b) What is the concept of data hiding ? What are the advantages of its application ?   2 + 2

c) Write a program to declare three classes $s1$, $s2$ and $s3$. The classes have a private data member variable of character data type. Read strings for the classes $s1$ and $s2$. Concatenate the strings, read and assign it to the data member variable of class $s3$.   4

d) Write a program to enter positive and negative numbers. Enter 10 numbers. Count the positive and negative numbers. Use classes and objects.   4

11. a) How are arguments passed to the constructors ?   3

    b) What is anonymous object ? What are qualifier

        classes ?   2 + 2

    c) What is parameterized constructor ? What do you mean

        by default constructor ?   2 + 2

    d) Write a program to declare a class with private data

        members. Accept data through constructor and display

        the data with destructor.   4

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