Roll No. | | | | | | | | | | |

No. of Printed Pages—3 **CS–501**

B. TECH.

FIFTH SEMESTER EXAMINATION, 2003-2004

OBJECT ORIENTED PROGRAMMING USING C++

Time : 2 Hours *Total Marks : 50*

Note : Attempt **ALL** the questions.

1. Answer any *FOUR* of the following :— **(3½×4=14)**

   (a) What exactly are Classes and Objects ? Explain. Give the applications of the Object Model.

   (b) Write the elements of the Object Model and explain Abstraction.

   (c) What do you understand by Modularity with respect to OOP ? Give advantages of modularity.

   (d) Define the term, Class and discuss the relationships among classes.

   (e) Explain the term, Hierarchy with the help of multiple inheritance.

   (f) What is the difference between Static and Dynamic bindings ? Explain.

2. Answer any *TWO* of the following :— **(6×2=12)**

   (a) Explain State Transition diagram with suitable examples. What do you mean by state actions and conditional state transitions ?

   (b) Give an example of Nested State diagram and define the term, Concurrency.

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(c) Prepare a dataflow diagram for computing the volume and area of a sphere. Input is radius of sphere, outputs are volume and area of sphere.

3. Answer any *FOUR* of the following :— **(3×4=12)**

(a) What is a dangling pointer ? How does an enum statement differ from a type def statement ?

(b) Define the term, Operator Overloading. Why can't * * be overloaded as an exponentiation operator ?

(c) What is the difference between a Constructor and a Destructor ? How many constructors can a class have ?

(d) How many times is the copy constructor called in the following code ?

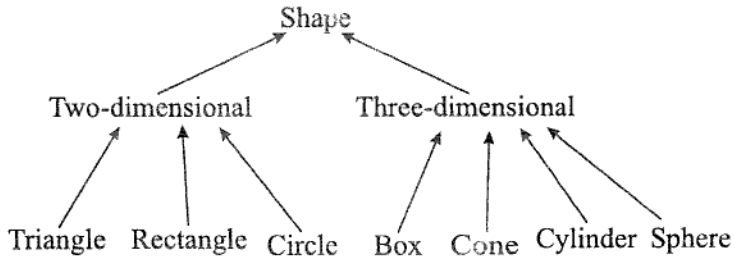
```
widget f(widget u)
{
    widget v(u);
    widget w = v;
   return w;
}
```

(e) Implement the string, comparison operator == directly, without using functions from the standard string, h header file.

(f) Overloading the input operator >> in the Rational class.

4. Answer any *TWO* of the following :— **(6×2=12)**

(a) Implement the following class hierarchy :—



(b) Write and test a program that instantiates a function template that implements a binary search of a sorted array of objects.

(c) Implement and test the following member function for the string class :—

istream & getline (istream & istr, char c= '|n'); This function reads a line of characters from the input stream object istr until it encounters the character c. These characters are stored in the object's buffer, and the input stream object is returned.