2004 CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING(C-DAC) M.C.A

END-TERM EXAMINATION
SECOND SEMESTER [MCA] – DEC 2004

OBJECT ORIENTED PROGRAMMING

Paper Code: MCA-110

Time: 3 Hours
Marks: 60

Q. 1 (a) Explain the following features of OOPS :- 8

(i) Message Passing
(ii) Extensibility
(iii)Delegation
(iv) Genericity

(b) Explain overloading of new and delete operators by giving examples. 4

Q. 2 (a) Write a program that illustrate the mechanism for handling exceptions in the vector class, while creating its objects and accessing its elements for reading or writing. The program should overload the operator [ ] to simulate the operations on the user defined data types. 6

(b) Write a program that reads a sequence of names, one per line, and then sorts and prints them. 6

Q. 3 (a) Implement a vector class with a default constructor, a destructor, overloaded assignment operator, subscript operator, stream insertion operator and stream extraction operator.
6
(b) Explain the concept of friend function and friend class by giving examples.
6

Q. 4 (a) Write a program of an examination database using inheritance which has three classes namely person, student and exam. The student class inherits the properties of person class and exam class inherits the properties of student class directly and properties of person class indirectly. 6

(b) What is polymorphism and how is it achieved by means of virtual functions? Give an example. 6

Q. 5 (a) Do derivation and friendship mean the same? What are the similarities and dissimilarities between the two? 4
(b) Describe how an object of a class that contains objects of other classes are created. 3

(c) Briefly explain the working of inline functions. Also discuss their merits and demerits. When Should functions be declared inline? 3

Q. 6 (a) What is a container class? Explain homogenous, heterogeneous and vector classes. Write a program to implement a vector class template. 6

(b) Implement a string class. Each object of this class will represent a character string. Data members are the length of the string and the actual character string. In addition to constructors, destructor, access functions, and a print function, include a “subscript” function. 6

Q. 7 Define the following:- 6
(i) Wild pointers
(ii) Garbage
(iii)Dangling Reference
Consider the following program:

```
#include
void main()
{
int * a;
const in * b;
int * const p;
int c=2, d=3
cout<*b=10;
b=new int;
*b=10
delete b;
cout<< *b;
a= new int [10];
a[9] = 20;
a[10]= 30;
a= new int[5];
a++;
++b;
cout<< *a;
}
```

In the above program find out where all garbage, dangling reference and wild pointers exists. Identify statements which are treated as erroneous by the compiler.

(b) Briefly explain the exception handling constructs. Write a program which binds a pointer to base class’ object to base or derived objects at runtime and invoking respective members if they are virtual. 6

Q. 8 Write a class template container to do binary tree operations (Create, print, traverse and search). The traverse should be in inorder, preorder and postorder. 12