



SECOND SEMESTER EXAMINATION-2012

OOP using C++
[MCA-201]

Full Marks: 60

Time: 3 Hours

Answer any six questions including question No.1 which is compulsory.

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable and

All parts of a question should be answered at one place only.

1. a) Is it true that friend functions have access to only public members [2x10]
of a class? Justify your answer.

b) What is an anonymous object? Give an example.

c) What is a namespace?

d) What is the output of the following code snippet?

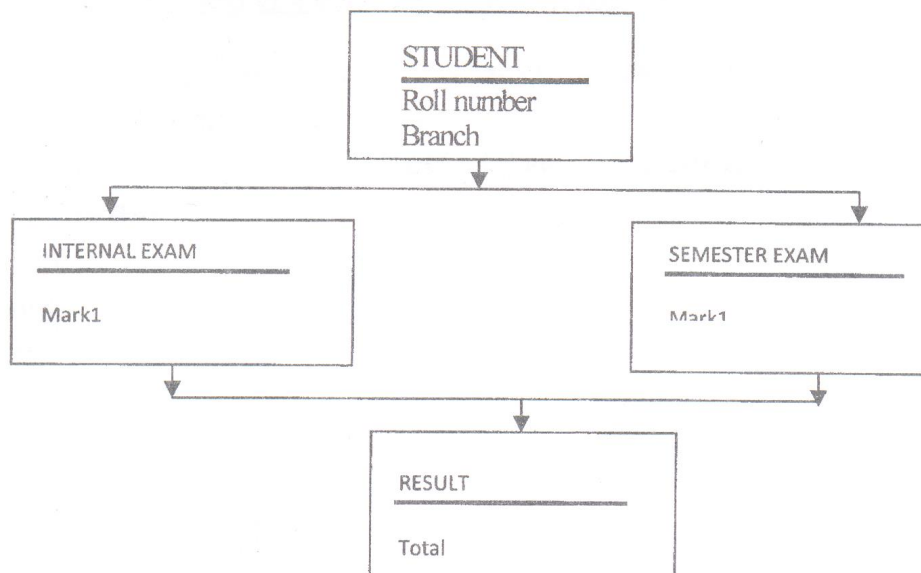
```
#include <iostream.h>
class test {
    public:
        static int n;
        test () { n++; };
        ~test () { n--; };
};
int test::n=0;
void main () {
    test a;
    test b[5];
    test * c = new test;
    cout << a.n << endl;
    delete c;
    cout << test::n << endl;
}
```

- ✓ e) How a structure in C++ is different from that in C?
- f) What are the advantages of passing function arguments by reference or pointer over passing by value?
- g) How the compiler can distinguish between overloading a prefix & a postfix unary operator? Explain.
- h) For which type of class private and protected members of the class can be accessed from outside the same class in which they are declared.

- i) How do the properties of the following two derived classes differ?
 class B1: private A {...};
 class B2: public A {...};
- j) What is the need of a virtual Destructor?
2. a) Discuss different storage classes in C++. [4]
- b) Write a program that defines a student class containing data members char *name, int roll_Number, int mark, char grade and necessary functions. Overload stream operators to accept and display objects of the student class. [4]
3. a) Compare Copy-Constructor with Copy-Initialization, give an example. Why the argument of a copy constructor is passed by reference. [4]
- b) Design two classes called *KM* and *MILES* to represent distance in the Kilometers and Miles. Implement data conversion function to access the following statements: [4]
 KM k1, k2; MILES m1, m2;
 k1 = m1; m2=k2.
4. a) What ambiguity may arise in case of multi-path inheritance? How can we overcome it? [4]
- b) Write user defined exception class to handle Zero-Divide exception. [4]
5. a) What is a constructor? What are the different types of constructors we can define? Explain with example. [4]
- b) Write a program to find the largest number in a given array by using function template where the array parameter is generic data type. [4]
6. a) What is a pure virtual function and an abstract class? Explain with examples. [3]
- b) Define own String class, Define constructors and member functions to: [5]
 * Concatenate two strings
 * To find string length
 * To find the first occurrence of a given character in a string.
 * To compare two strings

7. a) Discuss different Characteristics & Pitfalls of Operator-Overloading. [3]

b) Implement the following type of inheritance. Create appropriate class, data members and member functions to display the student details. Decide the Grade based on total (addition of internal and semester exam marks) using own defined range. [5]



8. Define a Time class that accepts hours, minutes and seconds as data members. Take user input of two time instances (t1 & t2) and calculate the time difference (t3) as below: - [8]

t3 . timeDifference (t1, t2)

t3 = t1. timeDifference (t2)

t3 = timeDifference (t1, t2)

t3 = t1 - t2

Where t1, t2, & t3 are objects of Time Class and "timeDifference" is the function to calculate the difference between times. Implement Nameless Object for the above 2nd case, the 3rd-case is to be implemented as Friend-Function and the 4th-case is to be implemented through operator overloading.
