KENYA METHODIST UNIVERSITY
FIRST TRIMESTER EXAMINATION, APRIL 2008

FACULTY	**:**	**SCIENCE AND SOCIAL STUDIES**
DEPARTMENT	**:**	**COMPUTER AND INFORMATION SCIENCE**
COURSE CODE	**:**	**COMP 111**
COURSE TITLE	**:**	**PROGRAMMING II**
TIME	**:**	**2 HOURS**

Instructions:

Answer ALL questions in Section A and any other TWO questions in Section B.

Section A (30 Marks)

i. Describe the C++ environment. (5 mks)

ii. In a C++ class declared with the keyword class, do members default to public or private? (2 mks)

iii. Give an example of how the keyword inline is used to declare as inline a method. (4 mks)

iv. Give three access specifiers of classes in C++. (3 mks)

v. Which header file should we include in a C++ program to be able to use the ***exit(1)*** function? (1 mk)

vi. Write a simple program to demonstrate how data input from the keyboard can be stored into a text file. (7 mks)

vii. Describe the functions of any three inbuilt string functions in C++. (6 mks)

viii. What is the importance of function prototyping in C++. (2 mks)

Section B

Question One (20 Marks)

i. Give the syntax of any three control structures. (6 mks)

ii. Write a complete C++ program that demonstrates operator overloading. (9 mks)

iii. Find and explain a bug, fix them (by marking up our code on this sheet), and then show your corrected version's output

```
const int Sentinel = -1;
int count=0;
float sum=0;
int score;
cout << "Enter scores, stopping with -1");
while (score != Sentinel)
{ cin >> score;
  count = count + 1;
  sum = sum + score;
}
cout << count << " scores averaging " << sum / count << endl;
//Assume user types in: 70 81 -1
```

(5 mks)

Question Two (20 Marks)

i. With relation to classes, define the following terms:
   a. Constructors
   b. Scope resolution operator
   c. Operator overloading
   d. Friend functions
   e. Multiple inheritance (5 mks)

ii. A small airline has purchased a computer for its new automated reservation system. You have been asked to program the new system. You are to write a program to assign seats on each flight of the airline's only plane (capacity: 10 seats).

   Your program should display the following menu of alternatives – Please type 1 for "First Class" and please type 2 for "Economy". If the person types 1 for, your program should assign a seat in the first class section (seats 1-5). If the person types 2, your program your program should assign a seat in the economy section (seats 6-10). Your program should print a boarding pass indicating the person's seat number and whether it is in the first class or economy class of the plane.

   Use a single-subscripted array to represent the seating chart of the plane. Initialize all the elements of the array to 0 to indicate all the seats are empty. As each seat is assigned, set the corresponding elements of the array to 1 to indicate that the seat is no longer available.

   Your program should, of course, never assign a seat that has already been assigned. When the first class section is full, your program should ask the person if it is acceptable to be placed in the non smoking section (and vice versa). If yes, then make the appropriate seat assignment. If no, then print the message "Next flight leaves in 3 hours". (15 mks)

Question Three (20 Marks)

i. Write a C++ program that searches for an element in an array of ten integer values. (10 mks)

ii. Write a recursive function in C++ for the following:
   a. GCD of two integer values
   b. Fibonacci of an integer value (10 mks)