KENYA METHODIST UNIVERSITY
END OF TRIMESTER EXAMINATION, APRIL 2007

FACULTY: **SCIENCE**
DEPARTMENT: **MATHEMATICS AND COMPUTER SCIENCE**
COMP 111: **PROGRAMMING II**
TIME: **THREE HOURS**

Instruction:

- **Answer question one and answer two other questions**.

QUESTION ONE (30 marks)

A. Define the following terms:
1. Syntax
2. Algorithm
3. Escape sequence
4. Include directive
5. Type casting (5Mks)

B. Write a C++ program that computes the total weight of tins and reads the number of tins and weight of one tin (3Mks)

C. Using *for, while* and *do…while* statements; write C++ programs that count 1 to 10 (6Mks)

D. Briefly describe 2 good programming practices in dynamic memory allocation (4Mks)

E. A user has given you the following pseudo code for a task he has to perform

```
a. j ← 80
b. do while j ≠ 0
c.         j ← j -5
d.         if j is divisible by 3 then
             goto line 2
e.         display j
f.         if there is no remainder when j divided by 35 then
             goto line 8
g. loop
h. display "Done"
```

a. Convert the pseudocode to structured C++ code. (4Mks)

b. What is the output of the program? (1Mks)

F. Write the steps in Linear (Sequential) search where the algorithm performs the search by, examining in turn each array element using a loop and testing whether the elements marches the target. (7Mks)

QUESTION TWO (15 marks)

A. A programmer is trying to write a program that adds corresponding elements of two arrays of the same size, and store the result into a new array. He has written the following program. Complete the code.

```
#include <iostream>
using namespace std;

int main()
{
        int arrayA[ ] = {12, 36, 18, 21};
        int arrayB[ ] = {16, 24, 27, 30};

        // declare the third arry
        int arrayC[5];

        // add the elements of arrayA and ArrayB and store in arrayC
                … incomplete
        // output the elements of the array using a pointer
        int* p = &arrayC;
                … incomplete
        return 0;
}
```

(5Mks)

B. Write a program that will input a list of array elements in integer value, sort the array using the Bubble Sort binary search and find the median. (10Mks)

QUESTION THREE (15 marks)

A. Use a function to write a C++ code that calculates the factorial of a value n. (9Mks)

B. What is the difference between
   a. Call by value and call by reference
   b. Function definition and function prototype
   c. Local variable and global variable (6Mks)

QUESTION FOUR (15 marks)

A. If one wants her/his program to use file for O/I, what are the 4 factors to consider. (4Mks)

B. Using structures write a C++ program to define a structure type CDAccount that contains 3 variables: balance, interest_rate and terms of type double, double and integer respectively. Have a function get_data(CDAccount the_account) that will display account terms (number of months) and compute the account balances. (11Mks)

QUESTION FIVE (15 marks)

A. Using *switch* and i*f ... else* loop statements, write the two grading programs. Consider the following grading system:

100-70 First Class Honors
60-69 Second Upper Division
50-59 Second Lower Division
40-49 Pass
0-39 Fail (8Mks)

B. Write a program that adds 5 to each employee number of vocation days. Use a function to do these adjustments. (7Mks)