

KENYA METHODIST UNIVERSITY
End of Trimester I Examination, April 2009

Faculty : Arts and Sciences
Department : Computer Information Systems
Course Code : CISY 110
Course Title : Introduction to Problem Solving
Time : Two Hours

Instruction:

- Answer questions ONE and ANY OTHER TWO questions.

QUESTION ONE (30 marks)

- a. Define the following terms as used in programming:
- Algorithm
 - Variable (4 marks)
- b. Briefly describe the steps involved in the problem solving process (6 marks)
- c. Write an algorithm that would be used to determine the smallest among three numbers. (5 marks)
- d. Write a C++ program to reads data from the keyboard and stores it into a file called INPUT, then displays it on the screen (5 marks)
- e. Distinguish between the following programming concepts:
- Call by value and call by reference
 - Function definition and function prototype
 - Local variable and global variable (6 marks)
- f. Determine the output that would be obtained from the following C++ code. (4 marks)

```
//MyName.cpp
#include <iostream>
using namespace std;

int main()
{
    int num1, num2;
    cout<<"enter the first number";
    cin>>num1;
    cout<<"enter the second number";
    cin>>num2;
    int num3 = num1 + num2;
    cout<<num3;
    return 0;
}
```

Answer ANY TWO questions in this section:

QUESTION TWO (15 marks)

- a. Using a *while loop*; write a C++ program that takes in several numbers and gives out the sum of the numbers. The program should determine from the user if there are more numbers to add, and should exit the loop when the user types N. (10 marks)
- b. Consider the following algorithm:
- i. begin
 - ii. get the number
 - iii. if number is negative
 - iv. display 'the number is negative, please enter a positive number'
 - v. repeat step 2
 - vi. end if
 - vii. display "Finally you entered a positive number"
 - viii. stop

Draw a flowchart representation of the algorithm (5 marks)

QUESTION THREE (15 marks)

- a. Write a recursive C++ program that calculates the factorial of a value n. (10 marks)
- b. Consider the following C++ program.

```
//MyName.cpp
#include <iostream>

int main()
{
    char myname;
    cout>>"Enter your name"
        cout<< endl;
    cout<<myname
    cout>>my name is
        cout<< myname
}

```

Rewrite the program to eliminate the five errors in the program (5 marks)

QUESTION FOUR (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 array
    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;
}
```

(7 marks)

b. Your program contains a function with the following definition:

```
int myswap(int num1, int num2)
{
    //function code in here
}
```

Give a C++ statement that declares the necessary variables, and makes a call to this function. State your assumptions (3 marks)

c. With the help of an example, describe how you do the following in a C++ program:

- i. Insert a comment
- ii. Declare an array of type *string*, called *names*, that can store up to 10 names.

(5 marks)