MURANGA UNIVERSITY COLLEGE

(A constituent College of Jomo Kenyatta University of Agriculture & Technology)

MAIN CAMPUS

ORDINARY UNIVERSITY EXAMINATIONS

2015/2016 ACADEMIC YEAR

SECOND YEAR FIRST SEMESTER EXAMINATIONS

FOR THE DEGREE
OF
BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

COURSE CODE: ICS2104

COURSE TITLE: OBJECT ORIENTED PROGRAMMING 1

DATE: 2015 **TIME:** Two Hours

INSTRUCTIONS TO CANDIDATES

Answer Question ONE (1) and **any** other TWO Questions

MRUC observes ZERO tolerance to examination irregularities

QUESTION ONE (COMPULSORY)

a) Define the following concepts and state advantage of each in OOP. [6 marks]
i) Overloading
ii) Inheritance
iii) Encapsulation

bi) C++ relies on functions during implementation of executions. Differentiate fully the *cout* and the *cin* functions used in C++ programming. [4 marks]
ii) Suppose that the operator << is to be overloaded for a user-defined class called mystery. Explain why operator << must be overloaded using a friend operator overloading Function.
[4 marks]

c) Declaration is the initial step in programming. Differentiate between the following statements used in C++.
i) Rectangle rect1; [4 marks]
Rectangle rect2()
ii) Car myCar(200); [4 marks]
Car yourCar;
d) Briefly explain any FOUR characteristics of a destructor [4 marks]
e) Mark the following statements as true or false. [4 marks]
I) The constructor of the derived class specify a call to the constructor of the base class in the heading of defining derived class constructor
II) Inheritance is "has a" relation
III) public members of a base class can be inherited either as public or private by the derived class
IV) When initializing the objects of the derived class, the constructor of the base class is executed last

QUESTION TWO

a) Write a C++ program that accepts two integer values works out their sum and outputs on a screen. [8 marks]

bi) Differentiate scope and lifetime of a variable. [4 marks]

ii) Explain why scope and lifetime of variables and functions are important. [2 marks]

iii) Differentiate a member function and a friend function. [2 marks]

c) Write the output of the following code. [4 marks]

```
// Example use of a while loop
#include <iostream>
using namespace std;

int main()
{
```

```
  int k=0, s=0, n;
  cout << "Input n: ";
  cin >> n;

  while (k<=n)
    s += k++;

  cout << "sum is " << s << endl;
  return 0;
}
```

QUESTION THREE

ai) Define "friend function". [2 marks]

ii) Explain why friend functions are passed object of the class that they have been to be a friend of. [2 marks]

bi) Suppose cType is a class template and func is a member function of cType. Show the heading of the function definition of func [4 marks]

ii) Suppose cType is a class template, which can take int as a parameter.Explain what the statement below means. cType<int> y; [4 marks

c) Write a C++ program which uses a function to determine the maximum number among three integers. [8 marks]

QUESTION FOUR

ai) Explain the difference between private and protected members of a class [4 marks]

ii) Define a stream. [2 marks]

bi) With aid of examples, explain the difference between opening a file using a constructor and using open() function [4 marks]

ii) Differentiate a constructor and a destructor. [2 marks]

c) Generate a C++ program that calculates the area of a triangle with the base and height input from the keyboard.

[8 marks]