THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Engineering and Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY – DICT10M

EIT 2202: ORIENTED PROGRAMMING IN C++

END OF SEMESTER EXAMINATIONS

SERIES: AUGUST/SEPTEMBER 2011

TIME: 2 HOURS

<u>**Instructions to Candidates:**</u>
You should have the following for this examination
- *Answer booklet*

Answer question **ONE (COMPULSORY)** and any other **TWO** questions
This paper consists of **FIVE** printed pages

Question 1 (Compulsory)

a) Define the term data type. Give the syntax for declaring variables   (4 marks)

b) Explain the following data types used in C++, Give an example in a program for each case.
                                                                                  (6 marks)

       i)   Int
       ii)   Long int
       iii)   Float
       iv)   Double
       v)   Short int
       vi)   Long double

c) The code segment below is in error. Identify the error and give an explanation for your answers   (5 marks)

```
class myclass{
public:
      static int i = 123;
};
int main ( ){
      cout<< "myclass::i = "<< myclass::i;
}
```

d) The following is a C++ program for a countdown using the while loop. Interpret the program beginning in main ().   (5 marks)

```
// custom countdown using while
#include <iostream.h>
using namespace stad;
int main ( )
{
int n;
cout<< "ENTER the starting number";
cin>>n;

while (n>0) {
cout,<n<< ", ";
}
cout << "fire";
return 0;
}
```

e) Briefly explain the following features of Object Oriented Programming   (10 marks)

       i)   Data encapsulation
       ii)   Polymorphism
       iii)   Overloading
       iv)   Inheritance
       v)   Generality

Question 2

a) Write a program in C++ to simulate the functionality of a simple calculator for addition subtraction, division and multiplication   (5 marks)

b) What is a variable? Give FIVE rules for declaring variables   (7 marks)

c) With examples in a program, explain the following variables   (4 marks)
   i)   Global variables
   ii)   Local variables

d) The *least common multiple* (LCM) of two integers is the smallest number that is evenly divisible by both two numbers. Write a function called LCM that takes two positive integers as input and computes their least common multiple   (4 marks)

Question 3

a) State the differences between the following:
   i)   A primitive and non-primitive data type   (2 marks)
   ii)   A static variable and an instance variable   (2 marks)
   iii)   A class and an object?

b) The program below is faulty. It is supposed to print out every other character of an entered word, starting with the first character. Correct the errors, referencing the line numbers at left. You do not need to rewrite the entire program. Marks will be deducted for changing (correcting) statements that are NOT IN ERROR   (10 marks)

```
1  #include <iostream>
2  using namespace std;
3  int main ( );
4  cout << "Enter a word: ";
5  string  s;
6  cin << s;
7  int x;
8  string z;
9  while (x <= s. length ( ) ) {
10 z = z + s.substr (x, l);
11 x ++;
12 }
13 cout << "the string with every other letter is: "
14 << z << \".   n";
15 return 0;
16 }
```

c) What is the output of the following program   (4 marks)

```
#include <iostream.h>

class blah {


public:
```

```
static int a;
intb;
blah(int x) {
b=x;
a=b+1;
}
};
int blah::a = 0;

int main (void) {

blah b1(5);
blah b2(12);
cout <<"bl.a is "<< bl.a << endl;
cout <<"bl.a is "<< bl.b << endl;
cout <<"b2.a is "<< bl.a << endl;
cout <<"bl.a is "<< bl.b << endl;
}
```

Question 4

a) Write a c++ function to find the largest number among three given numbers

(5 marks)

b) Write a do loop that prints out the odd numbers 1 through 99, separated by a comma

(3 marks)

c) Judy wants to check if the number of hobbits is either less than 3 or bigger than 6. Explain what is wrong with Judy's if *statement* and how to fix it   (3 marks)

   If (numHobbits<3 & numHobbits>6)

d) Explain the difference between the two expressions below   (2 marks)
   x =2 and x =2

e) Explain the difference between:

   i)   Public, Protected and Private Members of a Class   (3 marks)
   ii)   Non-virtual and Virtual functions   (2 marks)
   iii)   Operator overloading and functional overloading   (2 marks)

Question 5

a) Write a program (starting from #include) that repeatedly collects positive integers from the use, stopping when the user enters a negative number or zero. After that, output the largest positive number entered.   (8 marks)

b) Briefly explain the following Construction Tools as used in c++   (4 marks)

   i)   Linker

ii)   Complier

iii)   Debugger

iv)   Text editor

c) Write a cc+ to read the first 100 intergers and output the odd numbers only

(8 marks)