THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION TECHNOLOGY (DIT/MAY 2011)

EIT 2105: OBJECT ORIENTED PROGRAMMING IN C++

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: MAY/JUNE 2012
TIME: 2 HOURS

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Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FIVE** questions
Answer any **THREE** questions. Question **ONE** is compulsory
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

SECTION A (Compulsory – 30 marks)

Question ONE

a) What are the major differences between Object Oriented Programming and Procedural Programming (4 marks)

b) Differentiate between the following terms:
   i) Class and Object
   ii) #include and #define
   iii) Formal and Actual parameters

c) What is a constructor? State **TWO** features of constructors (4 marks)

d) State the meaning of the following concepts as used in C++ programming.
   i) Inline function (4 marks)
   ii) Virtual constructors

e) State any **TWO** data types used in C++ stating its size in bytes (2 marks)

Question TWO

a) Define inheritance. What are the different forms of inheritance? Give an example for each (6 marks)

b) Explain how the virtual base class is different from the conventional base classes of the object oriented programs (4 marks)

c) Explain the differences among private, protected and public access (6 marks)

d) What is this pointer? What is its significance (2 marks)

Question THREE

a) What is polymorphism? Explain with an example? (4 marks)

b) Define a friend function and state its advantage (3 marks)

c) What is function overloading and operator overloading (4 marks)

d) Is there any way to write a class such that no class can be inherited from it? If so include code to illustrate (3 marks)

e) What are advantages of pure virtual function? (2 marks)

f) Each variable has a scope in which it may be manipulated
   i) Explain completely the term 'scope of a variable' (1 marks)
   ii) State **TWO** disadvantages of making variables global in scope (2 marks)
   iii) In what circumstances would it be appropriate to use a global variable? (1 mark)

Question FOUR

a) Explain the difference between the following function calls (4 marks)
   i) Call by value
   ii) Call by reference

b) Write a program with a 5 x 5 array of type integer that will: (6 marks)
   i) Display the sum of each row
   ii) Display the sum of each column
   iii) Display the highest row sum

c) Explain the following programming error giving an example of each (4 marks)
   i) Syntax errors
   ii) Logic errors

d) Explain why the following program does not produce a meaningful answer:

```
int main()
{
Double area, length, width;
Area = length * width;
Length = 12.5; width = 4.2
Cout<<area<<endl;
Return 0;
}
```

Question FIVE

Write a function named “reduce” that takes two positive integer arguments, call them “num” and “denom”, treats them as the numerator and denominator of a fraction, and reduces the fraction. That is to say, each of the two arguments will be modified by dividing it by the greatest common divisor of the two integers. The function should return the value 0 (to indicate failure to reduce) if either of the two arguments is zero or negative, and should return variables in a program, then:

```
m=25;
n=15;
if (reduce(m,n))
cout<<m<<’/’<<n<<endl;
else
cout<< “fraction error”<<endl;
```

will produce 5/3. Note that the values of m and n were modified by the function call (20 marks)