



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering & Technology

DEPARTMENT COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION TECHNOLOGY – DIT 2K 11M/DIT 11M

EIT 2105: OBJECT ORIENT PROGRAMMING C++

END OF SEMESTER EXAMINATIONS

SERIES: DECEMBER 2011

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FIVE** questions in **TWO** sections **A & B**

Answer question **ONE (COMPULSORY)** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

SECTION A (COMPULSORY)

Question 1 (20 marks)

- a) What are the major differences between Object Oriented Programming and Procedural Programming. (4 marks)
- b) Differentiate between the following terms: (6 marks)
- 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. (4 marks)
- i) Inline function
 - ii) Virtual constructors
- e) State any **two** data types used in C++ stating its size in bytes (2 marks)

SECTION B (ANSWER ANY TWO QUESTIONS)

Question 2 (20 marks)

- a) Define inheritance. What are the different forms of inheritance? Give an example for each (8 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 3 (20 marks)

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

Question 4 (20 marks)

- 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:
- i) Display the sum of each row
 - ii) Display the sum of each column
 - iii) Display the highest row sum (6 marks)
- c) Explain the following programming error giving an example for each (4 marks)
- (i) Syntax errors
 - (ii) Logic errors
- d) Explain why the following program does not produce a meaningful answer: (6 marks)
- ```

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

```

### Question 5 (20 marks)

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 the value 1 otherwise. Thus, for example, if m and n have been declared to be integer 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)