



# THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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**MAIN EXAMINATION**

**JANUARY – APRIL 2018 TRIMESTER**

**FACULTY OF SCIENCE**

**DEPARTMENT OF COMPUTER AND LIBRARY SCIENCE**

**REGULAR PROGRAMME**

**CMT 210: OBJECT ORIENTED PROGRAMMING I**

**Date: APRIL 2018**

**Duration: 3 Hours**

**INSTRUCTIONS: Answer Question ONE and any other TWO Questions**

- Q1. a) Explain the following terms as used in object-oriented programming.
- i) Polymorphism
  - ii) Encapsulation
  - iii) Friend function
  - iv) Inheritance
- (8 marks)**
- b) Provide the general structure of the if...else...statement as used in C++.
- (2 marks)**
- c) Organization X is in need of an object oriented personnel management system. The information to be included consists of name of employee, department and salary. Further, managers draw the benefit of car loan. Using the concept of inheritance whereby the manager inherits employee information to add on the benefit, write, type, debug and execute your program and write sample input and the corresponding output in your answer booklet.
- (20 marks)**
- Q2. a) Write a brief note on the following:
- i) Abstraction
  - ii) math.h
  - iii) iostream.h
  - iv) fstream.h
- (8 marks)**
- b) Create a class to hold information of a husband and another for the wife. Using friend functions, write a program to get the total salary of the family.

Type, debug and execute your program and write sample input and the corresponding output in your answer booklet. **(12 marks)**

- Q3. a) Explain the purpose of any **six** library functions in C++. **(6 marks)**
- b) Write a C++ program to accept the details of an employee. Use the concept of array of objects to display information for n employees. Type, debug and execute your program and write sample input and the corresponding output in your answer booklet. **(14 marks)**
- Q4. a) Explain any **four** different forms of inheritance found in C++. Give an appropriate pictorial representation of each. **(4 marks)**
- b) With the help of simple example complete C++ programs, explain by giving the general syntax and purpose of the following control statements as used in the C++ programming language. Do not execute these programs.
- i) switch ..... statement **(4 marks)**
  - ii) while ... statement **(4 marks)**
  - iii) do ... while statement **(4 marks)**
  - iv) for ... statement **(4 marks)**
- Q5) a) Complete the visibility of inherited members table that follows:

Base Class Visibility	Derived class visibility		
	public derivation	private derivation	protected derivation
private			
protected			
public			

**(6 marks)**

- b) Explain the three basic logic patterns used in programming **(6 marks)**
- c) Using a class named “quad” and at least two user defined functions, write a C++ program to find the real roots, if any, of a quadratic equation using the formula.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Type, debug and execute your program and write sample input and the corresponding output in your answer booklet. **(8 marks)**

**\*END\***