KIBABII UNIVERSITY COLLEGE

(A Constituent College of Masinde Muliro University of Science and Technology)

UNIVERSITY EXAMINATIONS
2013/2014 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER EXAMINATIONS

FOR THE DEGREE
OF
BSc in Computer Science

COURSE CODE: CSC366E

COURSE TITLE: Object Oriented Analysis and Design

DATE: April, 2014 **TIME:** 3 Hrs

INSTRUCTIONS

- Answer **QUESTION ONE** and **ANY OTHER TWO**.

This Exam paper consists of 2 printed pages

Question #1:

a) State the following characters of bad software design [6 Marks]
   i: Rigidity
   ii: Fragility
   iii: immobility)

b) Describe the following software design principles and for each explain the characteristic of bad design that it addresses [24 Marks]
   i: Open Close Principle
   ii: Dependency Inversion Principle
   iii: Interface Segregation Principle
   iv: Single Responsibility Principle

Question #2:

a) What is a singleton? [2 Marks]

b) Draw a UML class diagram of a singleton. [3 Marks]

c) Write a class that has an operation which returns the factorial of a positive integer to its clients when the client pass it the integer. [5 marks]

d) Modify the class in c) so that it is a singleton. [10 Marks]

Question #3:

a) Explain how each of the following can be a problem and explain how to solve it.
   i: Shallow copy [10 Marks]
   ii: Object slicing [10 Marks]

Question #4:

a) Describe a situation that can give rise to the following pointers/reference [10 Marks]
   i: Dangling pointer/reference
   ii: Wild pointer/reference

b) Describe the problem known as memory leak and explain why it is not a problem in garbage collected languages. [10 Marks]

Question #5:

a) Using real-life examples, explain how aggregation differs from composition. [10 Marks]

b) Describe using examples how the following principles can be applied [10 Marks]
   i: Propagation Principle
   ii: Delegation Principle