



MURANGA UNIVERSITY COLLEGE

(A constituent College of Jomo Kenyatta University of Agriculture & Technology)

MAIN CAMPUS

SUPPLEMENTARY UNIVERSITY EXAMINATIONS

2014/2015 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER

FOR THE DEGREE

OF

BACHELOR OF BUSINESS INFORMATION TECHNOLOGY (BBIT)

COURSE CODE: ICS2201

COURSE TITLE: OBJECT ORIENTED PROGRAMMING II

DATE: 6th AUGUST 2015

TIME: 9.00-11.00AM

INSTRUCTIONS TO CANDIDATES

Question ONE (1) is compulsory
Answer THREE (3) questions

MRUC observes ZERO tolerance to examination irregularities

This Paper Consists of 2 Printed Pages. Please Turn Over. ►

Question One

a) Use the java code below to answer the questions that follow.

```
class atomClass
{
private:
int protons;
int neutrons;
int electrons;
protected:
static int electronCharge;
public:
atomClass();
atomClass(int p, int n, int e);
void setProtons(int p);
int getNeutrons();
};
```

- i) Explain the consequences of having set the neutrons data member to private. Why is it considered good practice for data members to be designated as private? (3 marks)
- ii) Under what circumstances would it be more appropriate for neutrons to be designated as protected? (3 marks)
- iii) Identify and briefly explain ONE example of polymorphism in atomClass. (3 marks)
- iv) Identify an accessor function in atomClass and provide an implementation for it. (3 marks)
- v) Identify the class and instance variables in atomClass, and state how many variables there would be in total if we declared 3 objects. (3 marks)
- b) By use of the *if elseif* control structure, develop a java program which outputs the correct grade of the marks from the following grading system; A=80 to 100, B=60 to 79, C=50 to 59, D=40 to 49, E=below 40. (8marks)
- ci) Explain what is meant by the term method signature. (2 marks)
- ii) Describe what is meant by the term method overloading and comment on the importance of method signatures in determining which method is overloaded. Illustrate method overloading with code written in an object oriented language with which you are familiar. (5 marks)

Question Two

- a) Briefly describe the following in the context of object oriented programming:
- i) Class;
- ii) Object. (4 marks)
- b) Describe two types of class members used in object oriented programming languages. (2 marks)

- c) Explain how three types of class member visibility are used in object-oriented programming. (4 marks)
- d) Using an object oriented language with which you are familiar, give an example of a class definition which illustrates the use of the concepts you described in your answer to parts b) and c). (10 marks)

Question Three

- a) Describe FIVE features you would expect to be present in an object oriented programming language. Give an example of how each feature is realised in an object oriented programming language with which you are familiar. (10 marks)
- b) Some object oriented programming languages have methods which are known as destructors whilst others implement garbage collection. Compare and contrast these approaches. (10marks)

Question four

- a) Explain the meaning of the term memory management and discuss why it is a necessary part of computer programming. (4 marks)
- b) Write code which demonstrates the way in which memory is allocated and initialized in an object oriented programming language with which you are familiar. (6 marks)
- c) Explain what the terms black-box testing and white-box testing mean and how these techniques could be used to test object-oriented software. Include the advantages and disadvantages of each in your discussion and suggest other methods that can be used to test such software. (10marks)