MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

UNIVERSITY ORDINARY EXAMINATION

2023/2024 ACADEMIC YEAR

SECOND YEAR **FIRST** SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING

SCS 202 – OBJECT ORIENTED PROGRAM

DURATION: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Answer question one and any other TWO Questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

SECTION A – ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

a) Define the following main features and concepts as used in OOP. (6 marks)
   i. Object
   ii. Class
   iii. Data abstraction
   iv. Encapsulation
   v. Polymorphism

b) Write a C++ program that accepts an integer to determines whether it's an odd or even. (6 marks)

c) Describe the key benefits of object oriented programming compared to structural programming. (6 marks)

d) Distinguish between the following terminologies as used in OOP
   i. Source code and object code (2 marks)
   ii. Implicit and explicit conversion (2 marks)
   iii. Base class and derived class (2 marks)
   iv. Global scope and local scope (2 marks)

e) Write a C++ / JAVA program using for loop that can display first ten positive number integers and calculate its squares. (4 marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

A proposed system intends to store the student data i.e. Student number, student name, phone number. It allows the access of the same data. The data should be hidden and not prone to manipulation. The data can be read and written using methods.

Required.

i. Create a class called student for the above in C++ / JAVA using get and set method to allow for data access and modification. (13 marks)

ii. Write a main function in the same C++ / Java program to instantiate an object from the class student and allow for student data to be input and displayed. (7 marks)

QUESTION THREE (20 MARKS)

a) The grading system of MUT is grade A to E in an exam. The student takes six units, average computed to assign gravies to following grades 'A' is greater than equal to 70, B is between 69 – 60, 'C' between 59 – 50, D is 49 – 40, 'E' below 40. As system developer you are required to write appropriate C++ / JAVA statement for the program that the following requirements. (15 marks)

   i. Allows input of 6 units
   ii. Calculate average
   iii. Output appropriate grade

b) An operator is symbol in C++ that tells the compiler to perform mathematical and logical features. Explain at least five operations in OOP. (5 marks)

QUESTION FOUR (20 MARKS)

a) Encapsulation defines the access levels for data elements of a class. Explain the three levels of access. (6 marks)

b) Create a class called bank account consisting of data members; account number, account holder, account balance methods for depositing and withdrawing. (5 marks)

c) Using examples to explain following functions used in C++/ Java implementation of class operations.

   i. Construction (3 marks)
   ii. Destructors (3 marks)
   iii. Friends function (3 marks)