MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

UNIVERSITY ORDINARY EXAMINATION

2021/2022 ACADEMIC YEAR

SECOND YEAR **SECOND** SEMESTER EXAMINATION

SCS 202 – OBJECT ORIENTED PROGRAMMING

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 object oriented programming
   i.   Objects   (2 marks)
   ii.   Classes   (2 marks)
   iii. Data obstruction   (2 marks)
   iv.   Encapsulation   (2 marks)
   v.   Inheritance   (2 marks)

b) Describe six benefits of object oriented programming over other programming languages.
                                                                    (6 marks)

c) A program is required which will read the length and width of a rectangle which will output the area and the length and perimeter of a rectangle. Write a program for this problem.   (6 marks)

d) Explain the following terms and demonstrate how its syntax implementation
   i.   Constructor and destructors   (4 marks)
   ii.   Implicit and explicit conversion   (4 marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

a) An operator is a symbol that tells the compiler to perform a specific mathematical or logical manipulation. C++ is rich with built-in operators and are mainly key word. Explain at least five operators used in OOP.   (5 marks)

b) A student is given grade 'A' to 'E' in an exam. So average of six units can be calculated, it is required to assign marks to these grades as follows
   'A' is greater than and equal to 70
   'B' is between 69 and 60
   'C' is between 59 and 50
   'D' is between 49 and 40
   'E' is below 40
   Write appropriate C++/Java statements for the program that allows input of six units, calculate average and output appropriate grade.   (15 marks)

QUESTION THREE (20 MARKS)

a) Explain the following concepts as used in inheritance and polymorphism in OOP:
   i.   Single and multiple inheritance   (2 marks)
   ii.   Private and protected members   (2 marks)
   iii. Abstract class and operator overloading   (2 marks)

b) The programmer use comment to include short explanation or observation within the source code itself. By use of example, explain two types of comments used in C++/Java.

(4 marks)

c) Define a class student with the following specification

Adm_no integer, Sname 20 characters, float (marks in three subjects OOP, CALCULUS, SAD) and Total float
calctotal() – function to calculate marks
Public member function of class student

getdata() – function to accept values Adm_no, Sname, marks in OOP, CALCULUS, SAD and invoke calctotal() to calculate total

displaydata() – function to display all data members on the screen

(10 Marks)

QUESTION FOUR (20 MARKS)

a) A program is required which will read the radius of a circle and will output the area and perimeter of the circle. Write a program for this problem using constant $Ps = 3.142$.

(6 marks)

b) Distinguish between the following terms as used in object oriented programming
  i.   Base class and derived class   (2 marks)
  ii. Global scope and local scope   (2 marks)
  iii. Source code and object code   (2 marks)
  iv. While loop and do while loop   (2 marks)

c) Write down the syntax declaration of the following OOP concepts
  i.   Class   (2 marks)
  ii. Function   (2 marks)
  iii. Inheritance   (2 marks)