MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR

FIRST-YEAR SECOND SEMESTER

SCHOOL OF PURE, APPLIED, AND HEALTH SCIENCES

BACHELOR OF SCIENCE IN MATHEMATICS, CHEMISTRY & PHYSICS

COURSE CODE: COM 2110-1
COURSE TITLE: OBJECT-ORIENTED PROGRAMMING

DATE: 5th April 2022 TIME: 8:30am-10:30am

INSTRUCTION TO CANDIDATE

i. Question ONE in section A is compulsory
ii. Answer any OTHER Two (2) Questions from section B
iii. Use diagrams, example and illustration where necessary
iv. All questions in section B have equal marks

SECTION A: COMPULSORY [30 MARKS]

QUESTION ONE [30 MARKS]

(a) Explain and why two methods you would use to insert comments in your C ++program **[2 Marks]**

(b) Explain any two methods you would use to insert comments in your C++ program **[2 Marks]**

(c) Give any three basic data types **[3 Marks]**

(d) Define the term "Array", show how both one dimension and two dimensional array is declared and created **[6 Marks]**

(e) Define FUNCTIONS in C++, demonstrate function declaration and definition in C++. WRITE a function ***gcd (m,n)*** that calculates the greatest common divisor of the integers m and m**.** **[7 Marks]**

(f) Discuss C ++ syntax , and write a program in C ++ that output

"***Real world programmers believe in C++,***
As it is object oriented program like JAVA!"

[10 Marks]

SECTION B: ATTEMP ANY TWO QUESTIONS [40 MARKS]

QUESTION TWO [20MARKS]

a) Explain the following terms: *Object* and *Class* as used in OOP **[2 marks]**

b) Real world objects have two parts, state and discuss using appropriate example in C++. **[4 marks]**

c) Why Object Technology? **[4 Marks]**

d) Provide the C++ syntax for the following compound statement with appropriate example.

   i. *If statement* **[2 marks]**

   ii. *If –else statement* **[2 marks]**

   iii. *While statement* **[2 marks]**

   iv. *Do-while statement* **[2 marks]**

   v. *For loop* **[2 Marks]**

e) Provide C++ program that will read numbers from a file and calculate their mean and standard deviation.

[10 Marks]

QUESTION THREE [20MARKS]

a) Define the term Encapsulation and Data Hiding and explain explicitly and implicitly in C++ **[3 Marks]**

b) Consider the following: A Point on a plane has two properties; x-y coordinates. Abilities (behavior) of a Point are, moving on the plane, appearing on the screen and disappearing. Write a C++ program for A model for 2 dimensional points with the following parts: Two integer variables (x ,y) to represent x and y coordinates A function to move the point: move, A function to print the point on the screen: print, A function to hide the point: hide. **[5 Marks]**

c) In reference to **question (f)** above, write a C++ program that accepts the results of N subjects and calculate the *sum* and *average*. **[4 Marks]**

d) Demonstrate how Multidimensional Arrays is declared and define a two dimensional array of [5] [4]. **[8 Marks]**

QUESTION THREE [20MARKS]

(a) Define the term inheritance as used object oriented programming and distinguish between ***base class*** and ***derived class***. **[6 Marks]**

(b) **Provide** inheritance syntax, and demonstrate with appropriate example in C++ **[4 Marks]**

(c) Write a program to guide a user to identify day numbers in a week. Your program should be written such that day 1 is monday and day 7 is sunday. It should prompt a user to enter any number from 1 to 7. If a user enters 4, for example, the program output should be. "*The fourth day is Thursday".* You **MUST** use the switch statement.

[10 Marks]

QUESTION FOUR [20MARKS]

a) How is a *class* **initialized** in C ++ **[3 Marks]**

a) Distinguish between **Default Constructor** and **Constructors with Parameters** with appropriate demonstration in C++. **[6 Marks]**

b) Define the terms *Composition* &*Aggregation* with appropriate example demonstrate using C++. **[11 Marks]**