MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS 2023/2024 ACADEMIC YEAR
SECOND YEAR FIRST SEMESTER

SCHOOL OF PURE APPLIED AND HEALTH SCIENCES
BSC COMPUTER SCIENCES

COURSE CODE: COM 2110-1

COURSE TITLE: OBJECT ORIENTED PROGRAMMING I

DATE: 15TH DEC 2023　　　　　　**TIME: 08:30am-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 [20 MARKS]

QUESTION ONE [20 MARKS]

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++.   **[2 marks]**
c) Why Object Technology?   **[2 Marks]**
d) **Provide** inheritance syntax, and demonstrate with appropriate example in C++   **[2 Marks]**
e) With appropriate example in C++ define *inline functions*   **[2 Marks]**
f) Define the term inheritance as used object oriented programming and distinguish between **base class** and **derived class**.   **[5 Marks]**

SECTION B: ATTEMP ANY TWO QUESTIONS [30 MARKS]

QUESTION TWO [15 MARKS]

a) Define the term Function Overloading   **[2 marks]**
b) Define the term Encapsulation and Data Hiding and explain explicitly and implicitly in C++   **[4 Marks]**
c) 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.   **[8 Marks]**

QUESTION THREE [15 MARKS]

a) Consider a payroll program that processes employee records at a small manufacturing firm. This company has three types of employees:
   i. Managers: Receive a regular salary.
   ii. Office Workers: Receive an hourly wage and are eligible for overtime after 40 hours.
   iii. Production Workers: Are paid according to a piece rate.

1) Identify objects and classes that support the problem domain and system's requirements. **[2 Marks]**
2) Identify class hierarchy **[2 Marks]**
3) Identify commonality among the classes **[2 Marks]**
4) Draw the general-specific class hierarchy. **[4 Marks]**
5) Provide C++ program that implement **question (a)** above **[5 Marks]**

QUESTION FOUR [15 MARKS]

a) How is a *class* **initialized** in C ++ **[2 Marks]**
b) Distinguish between **Default Constructor** and **Constructors with Parameters** with appropriate demonstration in C++. **[5 Marks]**
c) Define the terms *Composition* &*Aggregation* with appropriate example demonstrate using C++. **[8 Marks]**

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