MAASAI MARA UNIVERSITY

REGULAR
UNIVERSITY EXAMINATIONS

2019/2020 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER

SCHOOL OF SCIENCE AND INFORMATION SCIENCES
DEPARTMENT OF COMPUTING AND INFORMATION SCIENCE
BACHELOR OF SCIENCE IN INFORMATION SCIENCES

COURSE CODE: COM -2103
COURSE TITLE: OBJECT ORIENTED PROGRAMMING

DATE: 6TH DEC, 2019 TIME:8:30- 10:30

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 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) With appropriate example, explain and distinguish Declarations and Definitions in C++ **[4 Marks]**
e) With appropriate example in C++ define *inline functions* **[4 Marks]**
f) Define the term Function Overloading **[2 marks]**
g) Define the term inheritance as used object oriented programming and distinguish between ***base class*** and ***derived class***. **[6 Marks]**
h) **Provide** inheritance syntax, and demonstrate with appropriate example in C++ **[4 Marks]**

SECTION B: ATTEMP ANY TWO QUESTIONS [40 MARKS]

QUESTION TWO [20MARKS]

a) Define the term Encapsulation and Data Hiding and explain explicitly and implicitly in C++ **[4 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. **[8 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*. **[8 Marks]**

QUESTION THREE [20MARKS]

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. **[3 Marks]**
2) Identify class hierarchy **[3 Marks]**
3) Identify commonality among the classes **[4 Marks]**
4) Draw the general-specific class hierarchy. **[8 Marks]**
5) Provide C++ program that implement **question (4)** above **[2 Marks]**

QUESTION FOUR [20MARKS]

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

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

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

////////////////////////////**END**////////////////////////////