



MACHAKOS UNIVERSITY

University Examinations for 2017/2018

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR FIRST SEMESTER EXAMINATION FOR
BACHELOR OF SCIENCE (STATISTICS AND PROGRAMMING)

SST 202: OBJECT ORIENTED PROGRAMMING

DATE: 18/12/2017

TIME: 8:30 – 10:30 AM

INSTRUCTIONS:

This paper consists of FIVE questions.

Answer **question ONE** and **any other TWO** questions in this paper.

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Explain what is meant by the following OOP concepts (5 marks)
- i Object
 - ii Class
 - iii Encapsulation
 - iv Inheritance
 - v Polymorphism
- b) Differentiate between procedure oriented programming and object oriented programming listing three characteristics of each paradigm. (6 marks)
- c) Differentiate between the following with aid of examples: (8 marks)
- i Variable Declaration and Variable Initialization
 - ii Function Declaration and Function Definition
 - iii Local Variable and Global Variable

- iv One dimensional Array and Two Dimensional Array
- d) List and explain Five constants used in C++ programming (5 marks)
- e) List and explain giving examples four operators used in C++ Programming (4 marks)
- f) Describe **three** class access modifiers found in C++ programming. (3 marks)

QUESTION TWO (20 MARKS)

- a) In C++ programming, the type of inheritance is specified by the access specifier. Explain the rules that should be applied while using different type of inheritance. (6 marks)
- b) i) Define function overloading. (2 marks)
- ii) Write a program to overload function **Area()** to calculate area of a circle and area of a rectangle. (10 marks)
- c) Explain the use of **this** pointer in C++ program codes. (2 marks)

QUESTION THREE (20 MARKS)

- a) Write the C++ program code that will produce the following result

Value of a: 10

Value of a: 11

Value of a: 12

Value of a: 13

Value of a: 14

Value of a: 15

Value of a: 16

Value of a: 17

Value of a: 18

Value of a: 19

Using:

- i) While loop (2 marks)
- ii) For loop (2 marks)
- iii) Do...while loop (2 marks)

- b) Differentiate between the following (4 marks)
- i) Base class and Derived class
 - ii) Dot (.) operator and Operator of Scope (::)
- c) Write a C++ program to find sum of two integers using class and object. (10 marks)

QUESTION FOUR (20 MARKS)

- a) i) Define a Pointer. (2 marks)
- ii) Write a C++ program that defines a pointer **ip** of **integer** type and assign the pointer the address of a variable **var**, and let the pointer access the value at the address available in the pointer variable which is **20**. (6 marks)
- b) Describe the two ways member function of a class can be defined, give examples. (4 marks)
- c) With aid of an example, explain the syntax of a multiple inheritance. (2 marks)
- d) Write an inline function called **Max** of **integer** type with two arguments **x** and **y**. It should return the maximum of the two values **x** or **y**. (6 marks)

QUESTION FIVE (20 MARKS)

- a) Illustrate how comments are used in C++ (4 marks)
- b) Write a C++ program to get the Area of a Rectangle called **Rect**. Implement a function **getArea()** of **integer** type to get the area of the Rectangle. The function is found in the **Class Shape** whose object is **Rect**. The class shape has **public integer** data members **width** and **height** and functions **setWidth** and **setheight** both of **void** types. (10 marks)
- c) i) List **three** characteristics of a Destructor. (3 marks)
- ii) Write a C++ code to demonstrate a Destructor using Class **XYZ**. (3 marks)