



Machakos University
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University Examinations for 2017/2018 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING & INFORMATION TECHNOLOGY

Supplementary exam

Third Year First Semester Examination for Bachelor of Science Statistics

SMA 391: OBJECT ORIENTED PROGRAMMING

Date: December 2017

Time:

Instructions

This paper consists of FIVE questions.

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

Question One (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 (::)
- b) 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)