



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)

University Examinations 2013/2014

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SECOND SEMESTER DIPLOMA IN INFORMATION

COMMUNICATION TECHNOLOGY

DIT105 OBJECT ORIENTED PROGRAMMING I

Date: 15/12/2014

Time: 8:30 – 10:30 AM

INSTRUCTIONS

Answer Question 1 and any other two

- 1 a) Distinguish between the following terms as used in *Object Oriented programming*
 - i) Encapsulation and abstraction.
 - ii) Polymorphism and Inheritance
 - iii) Object and Class. (6 marks)
 - b) Outline **four** components of a *for loop* as used in C++ programming (4 marks)
 - c) Explain the different **access modifiers** in a *Class definition*. (6 marks)
 - d) Write a C++ program that will accept **three** values and then displays the *maximum* value among the three. (4 marks)
 - e) Explain the difference between *function overriding* and *function overloading* applied in OOP. (4 marks)
 - f) Write a C++ program that will implement a class containing the dimensions of *right angled triangle* (base and height) and a *parameterized constructor* to initialize the dimension as **12cm** and **5cm** respectively. The program should determine the *length* of the **3rd** side through the use of a function and output it. (6 marks)
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- 2 a) Outline **four** characteristics of destructors (4 marks)
 - b) Explain the different *scopes of variables* in C++ programming. (4 marks)
 - c) A class named **parent** has the following properties:
 - *height and weight* as data members;
 - *set_values* as a function member for initializing the values of weight and height as **60.5** and **1.2** respectively.

Write a C++ program to implement a *derived class* of a parent named **child**.

The derived class has a function used to determine the body mass index using the following formula.

Body mass index=weight/(height*height)

The program should output the body mass index and an appropriate message based on the following table. (8 marks)

Body Mass Index	Message
0 – 17.9	Under Weight
18 – 24.9	Normal Weight
25 - 30	Over Weight
>31	Obese

- d) Distinguish between *function declaration* and *function definition* as applied in C++ programming language. (4 marks)

- 3 a) The following are the properties of a base class used by students during a C++ Programming lesson:

- Marks of three subjects as data members;
- Function member to accept the marks in the three subjects

Write a C++ program that will implement five instances of a subclass of the base Class. The program should determine and output the *average marks* in the three Subject through the use of a member function (7 marks)

- b) Explain any **three** qualities of a good program (3 marks)
- c) Write a C++ program that uses an *array* to store **ten** values. The program should then print out the numbers in *reverse*. (6 marks)
- d) Explain any **four** types of inheritance (4 marks)

- 4 a) Write a C++ program that will display all the even numbers from 0 to 10. Use the **For** loop and the **If** statement. (6 marks)
- b) Differentiate between *continue* and *break* as used in C++ programming (4 marks)
- c) Explain the meaning of the term *Array* as used in C++. (2 marks)
- d) Explain the difference between the *do while* and the *while* loop (4 marks)
- e) Explain any four types of operators used in C++ programming (4 marks)

- 5 a) Write a C++ program that will carry out the following
- Defines a class named ***Employees*** that has a data member *rate*, a member function named *set* which is used to initialize the rate of payment for an employee and a polymorphic function for determining the honoraria based on the rate;
 - Implement the polymorphic function in two derived classes named manager and operator based on the following
 - Manager's honoraria = *rate* * 8;
 - Operator's honoraria = *rate* * 2;
 - Output the honoraria for a manager whose rate is 3000 and that of the operator whose rate is 1000.

Use pointers.

(7 marks)

- b) Explain any **three** data types under C++ programming (3 marks)
- c) Explain the difference between a *constructor* and a *destructor*. (4 marks)
- d) Explain the meaning of *control flow* as used in C++ programming giving an example. (3 marks)
- e) List any **three** advantages of functions (3 marks)