



(Knowledge for Development)

KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS
YEAR ONE SEMESTER TWO EXAMINATIONS**

**FOR THE DEGREE OF
BACHELOR OF SCIENCE COMPUTER
SCIENCE/IT**

**COURSE CODE : CSC 120
COURSE TITLE : OBJECT ORIENTED
PROGRAMMING I**

DATE: 27/07/2018 TIME: 02:00 P.M – 04:00 P.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.


QUESTION 1 (COMPULSORY)

a. Distinguish between method overloading and method overriding [2 marks]

b. Explain the concept of composition as used in object-oriented programming. How is composition different from inheritance? [3 marks]

c. Name and describe briefly three important properties that characterize object-oriented programming [6 marks]

d. A variable can be any sequence of characters that may include: a-z, A-Z, 0-9 and `_`. Additionally a variable name must be unique within its scope and is case sensitive. State three other rules that a variable must follow. [3 marks]

 e. Given the following incomplete Java method with the name *ValueOfPi* complete it so that it returns the value 3.141592. [2 marks]

```
public _____ ValueOfPi ()  
{  
    .....  
}
```

f. Explain the following terms: [4 marks]
i. a final variable

ii. a final method

g. Distinguish between the following terms as used in Java: [4 marks]

i. Class and Object.

ii. instance variable and static variable

h. What is encapsulation? [2 marks]

QUESTION 2

a) Define a class named TaxWhiz that computes the sales tax for a purchase. It should store the current tax rate as an instance variable.. This class should have one public method, calcTax(double price), which returns a double, whose value is price times the tax rate. For example, if the tax rate is 4 percent, 0.04, and the price is Ksh.100, the calcTax() should return 4.0. [8marks]

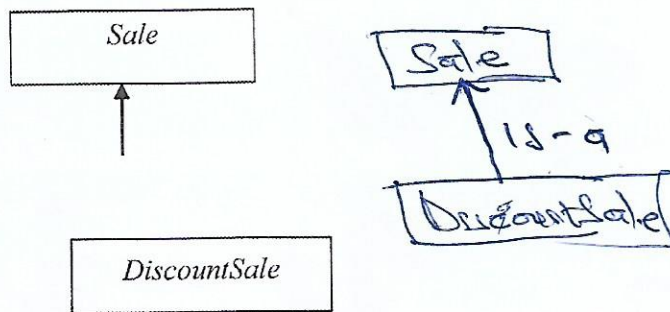
b) Create a class to represent a Circle. Your class should contain instance variables for the radius, a default constructor, set and get methods for the radius, as well as member method to calculate the area of the circle. Include in your class the method **toString** that returns the string "Circle object" when called. [12 marks]

QUESTION 3

(a) Inheritance is a form of code re-use technique used in object oriented programming. Briefly describe inheritance and explain how it achieves code-reuse. [3 marks]

(b) Consider an inheritance hierarchy in which the super class is a sale object that contains the name of the item for sale and the price of the item, and the subclass is a discount sale object which is a sale for which the percentage discount has been specified (e.g. 12% discount will be specified as 0.12)

i. Draw the inheritance hierarchy specified above. [2 marks]



ii. Define a class called Sale to represent a sale. Include in your class the following: ✓

A) a default constructor that sets the name to "No name yet" and price to 0.0. ✓ *not*

B) constructor with two parameters (*price name*)

C) a method called price that returns the price of the item [8 marks]

(c) Define a class called DiscountSale to represent a discount sale. Include in your class the following:

i. a default constructor that sets the discount to 0.0 [2 marks]

ii. a non default constructor *parameterized* [2 marks]

QUESTION 4

- a) Give the syntax of a Java method. [4 marks]
- b) Describe one situation in which it is appropriate to use the **this** operator. [2 marks]
- c) With respect to a class in Java, distinguish between a static variable and an instance variable [2 marks]
- d)
 - i. Discuss the public and private modifiers in context of methods and instance variables. [4 marks]
 - ii. Explain when it is appropriate to use the modifier protected and state an advantage and a disadvantage of using this modifier for instance variables. [4 marks]
- e) Describe the principle of information hiding in Java and explain how it facilitates the Software Engineering property of modularity [4 marks]

QUESTION 5

- a) Complete the following Java method called *login* so that it displays on the screen monitor a personalized login welcome given the user name. (For example given the user name Wekesa, it will display "Welcome Wekesa. Login successful!") [4marks]

```
public _____ login(String name)
{
.....
}
```

- b) Explain what a constructor in Java is distinguishing between default and non-default constructor. State clearly what a constructor is used for in your explanation. [5 marks]
- c) Write a Java class that represents a Person with instance variables name, id, and districtOfBirth. Include a default constructor and non default constructor, set and get methods. [11 marks]