



# SOUTH EASTERN KENYA UNIVERSITY

## UNIVERSITY EXAMINATIONS 2016/2017

### SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY

#### SCI 204: OBJECT ORIENTED ANALYSIS DESIGN & PROGRAMMING

DATE: 11<sup>TH</sup> APRIL 2017

TIME: 10.30 – 12.30 PM

#### INSTRUCTIONS TO CANDIDATES

- a) Answer **ALL** questions from section A(Compulsory)
  - b) Answer **ANY TWO** questions from section B
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#### SECTION A (COMPULSORY)

##### Question One

- a) State two types of constructors used in Java. (2 marks)
- b) Explain each of the following concepts as used in object oriented programming:
  - i) Encapsulation;
  - ii) Inheritance;
  - iii) Polymorphism; (3 marks)
- c) Write a java class that extends the following abstract class. (4 marks)

```
abstract class Vehicle{
    abstract void run();
}
```
- d) Outline two benefits of using object oriented programming. (2 marks)
- e) Each phase in the Rational Unified Process can be further broken down into iterations. Outline two factors that influence iteration length. (3 marks)
- f) Write a java program that will allow user to enter three values through keyboard in an array named *marks* then output the average of the three values. (5 marks)

g) Draw a use case diagram from the case study below:

Prosperity Bank has an ATM machine where a user is expected to enter card then PIN. The card and PIN are verified before the user can proceed with a transaction. The user selects the account to use then selects amount either in multiple of KES 500 or KES 1000. The amount is verified if its available. User has an option of requesting for receipt or not. The system concludes the transaction when user is provided with funds and receipt or transaction fails. **(5 marks)**

h) Write a java program that will allow user to enter order number through a keyboard. The program should output the details and amount for the order selected based on the following table; use switch decision structure **(6 marks)**

ORDER NO	DETAILS	AMOUNT
1	Fried Beef and Ugali	300
2	Liver and Fries	250
3	Tilapia Fish and Rice	250
4	Fried Chicken & Fries	400

### SECTION B (40 MARKS)

Answer *two* questions from this section

#### Question Two

- a) Outline two rules one has to adhere to when creating a constructor. **(2 marks)**
- b) Outline three advantages of polymorphism. **(3 marks)**
- c) Explain the following concepts as used in Java Development Kit (JDK):
- i) Jar;
  - ii) Javadoc. **(4 marks)**
- d) Modify the java program below to demonstrate constructor overloading. **(5 marks)**

```
Publicclass Students {
    String name;
    intid,age;
    public Students(int i, String n) {
        id=i;
        name=n;
    }
    void display(){
        System.out.println(id+" "+name+" "+age);
    }
    publicstaticvoid main(String[] args){
        Students=new Students(20,"Jane");
        obj.display();
    }
}
```

### Question Three

- a) Outline three reasons for using Exception handling. **(3 marks)**
- b) Explain three benefits of inheritance as used in object oriented programming. **(6 marks)**
- c) Albert downloaded the *Versitycourses* class shown below from the internet

```
import java.io.*;
public class Varsitycourses{
    public static void main(String args[]){
        int courses[] = new int[10];
        System.out.println("Access element three :" + courses[20]);
    }
}
```

She tried to execute the class but she got a java.lang.ArrayIndexOutOfBoundsException error.

- i) Explain the meaning of the above error. **(2 marks)**
- ii) Rewrite the program to include exception handling. **(4 marks)**
- d) Using for loop structure write a java program that will output odd numbers between 80 and 20. **(5 marks)**

### Question Four

- a) Outline two properties of an interface. **(2 marks)**
- b) Write a java program that will check number entered by user through keyboard, if the value is odd it should output "ODD" else "EVEN". **(5 marks)**
- c) In object oriented programming access modifiers can be used to implement encapsulation. Explain two that are used in java. **(4 marks)**
- d) Write a class that will implement the interface shown below. **(8 marks)**

```
publicinterface Register {
    voidsetStudentName(String name);
    voidsetStudentAge(int age);
}
```

**END.**