

SCO 103

Pink I



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012
SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF
COMPUTER SCIENCE

SCO 103 OBJECT ORIENTED PROGRAMMING I

DATE: WEDNESDAY, 11TH APRIL 2012

TIME: 2.00P.M – 4.00P.M

INSTRUCTIONS: Answer question ONE and any other TWO

QUESTION ONE (30 marks)

(a) Explain what you understand by object oriented programming.

where programmer keeps the world as collection of objects that belong to certain class
C easy to maintain good framework of code library provides a module structure

(2 marks)

(b) Java's bytecodes are portable. Explain.

java platform independent format

(2 marks)

(c) Assuming that $x = 2$ and $y = 3$, what does the following statement display:

`System.out.printf("%d = %d\n", (x + y), (y + x));`

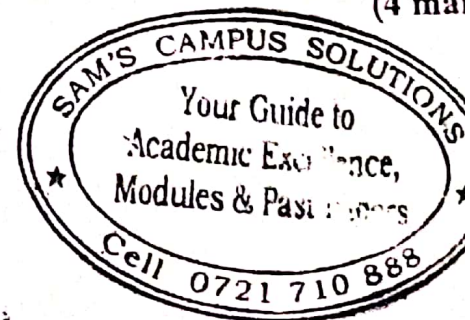
*2+3, 3+2
5, 5*

(4 marks)

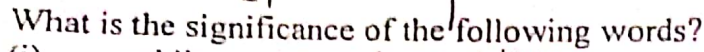
(d) Given the following code extract.

```
public static void main (String args[]){
```

```
}
```



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- (5 marks)**

i. Encapsulation —

ii. Inheritance –

(4 marks)

iii. Polymorphism - diff. objects behave

(4 marks)

(4 marks)

$$J \mathcal{O}_1 \mathcal{G}_{\text{new}} R = J$$

(5 marks)

Question Two

✓ (a) Distinguish between the following access specifiers in Java:

- i. Protected
- ii. Private - available within to cannot else
- iii. Public - available to all class in a package
- iv. No keyword coded

(8 marks)

✕ (b) Comment on the result of the following programme:

(3 marks)

```
public class Test
```

```
{
    public static void main(String [] args)
    {
        int x = 3;
        int y = 1;
        if (x == y)
            System.out.println ("Not equal");
        else
            System.out.println ("Equal");
    }
}
```


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* (c) Explain the role of the following packages in Java programming language.

- (4 marks)
- (i) java.io
 - (ii) java.awt
 - (iii) java.applet
 - (iv) javax.swing



Question Three

(a) Evaluate the following statement:

$$X = 2\%2 + 2*2 - 2/3$$

(30 marks)

(6 marks)

(b) Write a Java program that creates a two dimensional array with four rows and five columns and fills it with the sum of the row and column indexes.

(9 marks)

0 1 2 3 4 5
1
2
3

Question four

(a) Write a simple Java program with one class that can be used to display all the integers between 1 and 100 that are divisible by both 3 and 5. (8 marks)

(b) Differentiate between primitive and non-primitive data types. (4 marks)

(c) Give three primitive data types used in Java. (3 marks)

Integer long
double short
float byte

Question five

A certain college uses the following grading system to award grades to their students.

Mark= 75-100 A

Mark= 60-74 B

Mark=50-59 C

Less than 50 Fail

Write an appropriate object oriented program using Java that can be used to read in a mark and award the grade.

(15 marks)

- (c) Explain the role of the following packages in Java programming language.
- (i) java.io - Contains the classes that handle fundamental input and output operations in Java.
 - (ii) java.awt - Contains all the classes for creating user interfaces and painting graphics.
 - (iii) java.applet - Provides the classes necessary to create an applet and the classes an applet uses to communicate with its applet context.
 - (iv) javax.swing - Provides a set of "lightweight" (all-Java language) components that, to the maximum degree feasible, work the same on all platforms.

(4 marks)

Question Three

- (a) Evaluate the following statement:

(6 marks)

$$X = 2 \% 2 + 2 * 2 - 2 / 3$$

- (b) Write a Java program that creates a two dimensional array with four rows and five columns and fills it with the sum of the row and column indexes.

(9 marks)

0 1 2 3 4 5

Question four

- (a) Write a simple Java program with one class that can be used to display all the integers between 1 and 100 that are divisible by both 3 and 5.

(8 marks)

- (b) Differentiate between primitive and non-primitive data types.

(4 marks)

- (c) Give three primitive data types used in Java.

(3 marks)

int, long, short, byte, float, double

Question five

A certain college uses the following grading system to award grades to their students.

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Mark= 50-59 C
Less than 50 Fail

Write an appropriate object oriented program using Java that can be used to read in a mark and award the grade.

(15 marks)



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SOLUTIONS

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INSTRUCTIONS: Answer question ONE and any other TWO.

QUESTION ONE (30 marks)

- (a) Explain what you understand by object oriented programming. *where programmer keeps the word as collection of objects that belong to a class* (2 marks)
- (b) Java's bytecodes are portable. Explain. *Bytecode is a programming paradigm that represents concepts as objects. It is a platform independent format. The compiled codes are executable on any processors and systems, i.e. the Java Virtual Machine (interpreter) is installed in those systems.* (2 marks)
- (c) Assuming that $x = 2$ and $y = 3$, what does the following statement display:

`System.out.printf("%d = %d\n", (x + y), (y + x));`

*2+3, 3+2
5, 5*

5 = 5

By default java takes each argument as string (4 marks)

(d) Given the following code extract.

```
public static void main (String args[]) {
    // Main method is declared as "public" to provide access to the JVM to call this method without being a member of that class.
    // Main method is declared as "static" to allow the JVM to call main without creating object.
    // Main method is designed not to return anything to the JVM, hence the return type of the main method is "void".
}
```

Bytecode is the form of instructions that the Java virtual machine executes. Each bytecode opcode is one byte in length although some opcodes require parameters, resulting in some multi-byte instructions. This ensures portability of Java.

The compiler generates bytecode instructions which have nothing to do with a particular computer architecture. Rather, they are designed to be both easy to interpret on any machine and easily translated to native code.