

Machakos University College

January-April 2015

2 Hours

SCO 103: Object Oriented Programming I

Answer Question ONE and any Other TWO Questions

Question ONE (30 Marks)

- a) Define the following terms
 - i. Recursion (2 marks)
 - ii. Local variable (2 marks)
 - iii. Method overloading (2 marks)
- b) Explain why java is said to a “strictly typed” language (3 marks)
- c) Give reason(s) why the following identifier names are invalid:
 - i. 76mark (1 mark)
 - ii. bank Balance (1 mark)
 - iii. #DoB (1 marks)
 - iv. new (1 marks)
- d) Describe the following components and features of object oriented Programming. Use appropriate examples:
 - i. Class (2 marks)
 - ii. Object (2 marks)
 - iii. Polymorphism (2 marks)
 - iv. Inheritance (2 marks)
 - v. Encapsulation (2 marks)
 - vi. Abstraction (2 marks)
- e) Write a java program that returns the product of two integer numbers. Make use of a method called **product** (5 marks)

Question TWO (20 Marks)

- a) Illustrate how any three types of java comments may be used (3 marks)
- b) Provide a **java** statement to declare an array of integer and initialize its' elements to 10 , 20 , 30, 40 and 50 respectively (4 marks)
- c) Write a java program to find the sum of digits of an integer number. (6 marks)
- d) Write a java method that sorts out the contents of an array of integers and return the element of the maximum value (7 marks)

Question THREE (20 Marks)

- a) Explain two different types of exceptions (4 marks)
b) Write a java program that produces the following output: (4 marks)

```
*****  
  
*****  
  
*****  
  
*****  
  
*****  
  
***  
  
**  
  
*
```

- c) Explain the basic parts of a **for** loop (6 marks)
d) By the use of the conditional operator, write a java program that return the smaller of two integer numbers (6 marks)

Question Four (20 Marks)

- a) Differentiate between unary operator and binary operator (2 marks)
b) Using switch statement, write a java program to demonstrate the operations of a simple calculator(multiplication, division, modulus division, addition and subtraction) (8 marks)
c) Write a java program to display the real roots of a quadratic equation is any using the formula, $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ (10 marks)

Question Five (20 Marks)

- a) What is the difference between the following statements? (2 marks)
i. `System.out.println("MUC");`
ii. `System.out.print("MUC");`
b) Explain the usage of the following keywords in java? (4 marks)
i. `extends`
ii. `implements`
c) Write a simple Java application that displays a student's name and registration number on two separate lines (4 marks)
d) Define a recursive method that returns the factorial of a number. The argument to the method is an integer whose factorial is to be found (10 marks)