



**THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE**

**(A Constituent College of JKUAT)**

(A Centre of Excellence)

# **Faculty of Engineering & Technology**

**DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING**

**UNIVERSITY EXAMINATION FOR:  
BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING  
(BSC ME)**

**EMG 2210: COMPUTER PROGRAMMING II**

**END OF SEMESTER EXAMINATION  
SERIES: DECEMBER 2012  
TIME: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FIVE** questions

Answer question **ONE (COMPULSORY)** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

---

**Question One (Compulsory)**

- a) Illustrate **TWO** data types used java. Give examples. **(4 marks)**
- b) Provide definitions for the following terms/phrases. **(10 marks)**
- (i) Java Bytecode
  - (ii) Java Virtual Machine
  - (iii) Java Garbage Collector
  - (iv) Java Class
  - (v) Java Object
- c) Identify the **FOUR** access modifiers used in Java. **(4 marks)**

- d) Write a Java program prompts the user for a surname and prints it in uppercase. **(6 marks)**
- e) Write a java program that uses string concentration to output the following. **(6 marks)**
- ```
a
a b a
ab ac ab a
ab ac ab ad ab ac ab a
12
```

### Question Two

- a) Explain the following java programming terms/phrases. **(10 marks)**
- (i) Public
  - (ii) Static
  - (iii) Void
  - (iv) Main ()
  - (v) String args [ ]
  - (vi) Args [ ]
- b) List **FIVE** characteristics of a constructor method. **(5 marks)**
- c) Outline **FIVE** characteristics of a destructor method. **(5 marks)**

### Question Three

- a) Explain the term method overloading and give its **TWO** advantages. **(4 marks)**
- b) Differentiate between the **THREE** types of access specifiers, private, public and protected. **(6 marks)**
- c) Write a java program that prompts the user for a number and gets its factorial. **(10 marks)**

### Question Four

- a) State **THREE** characteristics of a static data member. **(4½ marks)**
- b) Define the following terms:
- (i) Inheritance
  - (ii) Base class
  - (iii) Sub class **(4½ marks)**
- c) List **THREE** types of errors in Java programming. **(3 marks)**
- d) Write a C program that prompts the user for students marks and displays grade A if marks is  $\geq 70$ , B if marks greater than 60 but less than 70, C if marks greater than 50 but less than 60, D if marks greater than 40 but less than 50 and F if marks less than 40. **(8 marks)**

### Question Five

- a) Explain how exceptions are handled in java. **(4 marks)**
- b) List **THREE** similarities and **THREE** differences between an interface and a class. **(6 marks)**
- c) Write a java program to compute loan repayment period based on the following formula.

$$\text{Monthly Repayment} = \text{Loan Amount} * \text{Monthly Interest} / (1 - \text{Math.pow}(1/1 + \text{monthly interest}, \text{number years} * 12))$$

**(10 marks)**