



TECHNICAL UNIVERSITY OF MOMBASA
Faculty of Engineering & Technology
DEPARTMENT OF COMPUTER SCIENCE & INFORMATION
TECHNOLOGY

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY Y2 S2
BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING Y2 S2

ICS 2175-BIT2102: COMPUTER PROGRAMMING

SUPPLEMENTARY / SPECIAL EXAMINATION

FEBRUARY 2013

Time: 2 Hours

Instructions to Candidates

- Question **ONE** is Compulsory
 - Answer any other **TWO** Questions
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QUESTION 1

- a) Explain briefly the following object oriented concepts.
- i) Abstraction and Encapsulation. (4 marks)
 - ii) Methods and messages. (4 marks)
 - iii) Inheritance. (3 marks)
 - iv) Polymorphism. (3 marks)
- b) Identify the four access modifiers used in java or C++/JAVA (4 marks)
- b) Write a java/C++ program prompts the user for a surname and prints it in uppercase. (6 marks)

- d) Write a programme (C++ or JAVA) that prompts the user for two numbers, the breadth of a rectangle and the height of a rectangle. Use a message box to calculate the area of the rectangle. (6 marks)

QUESTION TWO [20 marks]

- a) One object in Java/C++ can be assigned as reference to another object of the same type.” To explain this concept write a complete Java/C++ program and explain how a reference object works. (5 marks)
- b) What is a checkbox? How would you put checkboxes on an applet? Explain how checkbox group is created in Java. (5 marks)
- c) Find the errors in the following Java program, and correct them. (5 marks)

```
public class My String
{
public void main(string)
{ String str = “Java Programming”;
Str.reverse();
System.out.println(“Capacity:” + str.capacity());
}
}
```

- d) Outline five characteristics of a destructor method (5 marks)

QUESTION 3 [20 marks]

- a) What is a bitwise operator? If i is inti = 32, what will the value of i be after (5 marks)
- (i) $i = \lll 3$;
 - (ii) $i = i + i \lll 2$?
- b) Differentiate between the three types of access specifiers private, public and protected (5 marks)
- c) Write a java program that prompts the user for a number and gets its factorial. (10 marks)

QUESTION 4 [20 marks]

- a) State three characteristics of a static data member (4.5 marks)
- b) Define the following terms (4.5 marks)
- i. Inheritance
 - ii. Base class:
 - iii. Sub class:
- c) List three types of errors in java/C++ programming. (3 marks)

- d) Write a Java/ C++ program that prompts the user for students marks and displays grade A if marks is ≥ 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 5 [20 marks]

- a) What is an exception? Write an exception subclass which throws an exception if the variable age passed as argument to a method and the value of age is less than 20. (5 marks)
- b) List three Similarities and three differences between an interface and a class. (6 marks)
- c) Write a java/C++ program to compute Loan Repayment Period based on the following formula

$$\text{MonthlyRepayment} = \text{loanAmount} * \text{monthlyInterest} / (1 - (\text{Math.pow}(1 / (1 + \text{monthlyInterest}), \text{numberYears} * 12))$$

(9 marks)