



TECHNICAL UNIVERISTRY OF MOMBASA

# Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATIONS FOR DEGREE IN:  
BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY  
(BSIT 14S – J-FT)

**ICS 2104: OBJECT ORIENTED PROGRAMMING I**

END OF SEMESTER EXAMINATION  
**SERIES: APRIL 2015**  
**TIME: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions.

Attempt 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

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**Question One (Compulsory)**

a) Briefly describe the following features of Object-Oriented programs:

(i) Encapsulation

(ii) Polymorphism

(iii) Data abstraction

**marks)**

**(6**

b) Enumerate at least **THREE** differences between procedural programming and object oriented programming

**(3 marks)**

- c) Differentiate between the following:
- (i) Base class and Derived class (4 marks)
  - (ii) Local variable and Global variable (4 marks)
  - (iii) Prefix Operators and Postfix Operators (4 marks)
- d) Write a segment of code that gets the sum of all numbers between 100 and 300 that are divisible by 5 using the:
- (i) do..while loop (5 marks)
  - (ii) For..loop (4 marks)

### Question Two

With the use of java code fragments, implement the following features of object-oriented paradigm:

- a) Inheritance (5 marks)
- b) Polymorphism (5 marks)
- c) A class to hold student details and calculate student marks (5 marks)
- d) A statement to instantiate two objects of the class defined in (iii) above and initialize them with appropriate values (5 marks)

### Question Three

- a) Using appropriate examples, describe the THREE control structures in Java programming language (9 marks)
- b) There are TWO major types of Java programs. List the TWO types of programs and explain how they differ from one another (6 marks)
- c) Explain the main differences between Do..while and while...statement (5 marks)

### Question Four

Write a program that uses a class employee to display an employee's information. The class should include the following members. Data members:

- Employee number
- Employee name
- Basic salary
- House allowance
- Medical allowance
- Income tax

Member functions:

- To read values
- To calculate Gross salary (basic salary + house allowance + medical allowance)
- To display values (inputs, outputs etc) (20 marks)

### Question Five

- a) Define the following:
  - (i) Constructor (3 marks)
  - (ii) Method (3 marks)

- b) Write a program that uses a class named circle to accept the radius of a circle and compute both the area and circumference (area = $\pi$ \*radius\*radius, circumference= $\pi$ \*diameter) **(14 marks)**