



THE TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY
DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY
(DICT 12S)

ECS 2105: OBJECT-ORIENTED PROGRAMMING

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: OCTOBER 2013

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** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One (Compulsory)

Explain the following object-oriented concept:

- (i) Classes and objects
 - (ii) Data abstraction
 - (iii) Encapsulation
 - (iv) Polymorphism
 - (v) Dynamic binding
 - (vi) Message passing
- (20 marks)**

Question Two

- a) Explain the term private and public as used in data hiding. **(4 marks)**
- b) Explain the following terms:
- (i) Module re-use
 - (ii) Portability
- (8 marks)**
- c) Write a class with a function to compare three values and display the largest. **(8 marks)**

Question Three

- a) (i) Explain the term:
- (i) Static class member
 - (ii) Local variable
 - (iii) Global variable
- (6 marks)**
- (ii) Write a program in C++ Programming language to read twenty integer values, calculate sum and average. Use loop. **(10 marks)**
- b) Explain the term array as used in object-oriented. **(4 marks)**

Question Four

- a) Write a C++ program to calculate the value x in quadratic equation given the following
 $ax^2 + bx + c = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Determine $b^2 - 4ac$ if determinant > 0

$$x_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

$$x_2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

If determinant = 0

$$x_1 = x_2 = -b/2a$$

If determinant < 0

“equation has no roots”

(20 marks)

b) Write any FIVE structured features of C++ programming language

(10 marks)

Question Five

a) The flowchart calculates income tax. Write a C++ program corresponding to the flowchart

(10 marks)

b) With examples explain the three control structures in C++ programming language

(10 marks)