



THE TECHNICAL UNIVERISTY OF MOMBASA

# Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY  
DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY  
(DICT 13J)

**ECS 2104: STRUCTURED 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)

- a) Explain the difference between compiler and interpreter (4 marks)
- b) Draw a program flowchart to calculate the sum and average of even integers from 1 to 100. Use loop (8 marks)
- c) Implement the Q1(b) above using C programming language (8 marks)

### Question Two

- a) Explain the following as used in programming:  
(i) Portability  
(ii) Module re-use (4 marks)
- b) Draw a program flowchart to read three integer values, compare them then display the largest (8 marks)
- c) Implement the Q2(b) above using C programming language (8 marks)

### Question Three

- a) Write a C program to calculate the value X in quadratic equation given the following

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

$$\text{Determinant} = b^2 - 4ac$$

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” (8 marks)

- b) Explain the objective of drawing program flowchart (6 marks)
- c) Develop C program having a function to calculate the cube of value X

**Question Four**

- a) Develop a C program to read two integer values then multiply, divide, subtract and add them. The following menu should be developed  
PRESS 1 TO MULTIPLY  
PRESS 2 TO DIVIDE  
PRESS 3 TO SUBTRACT  
PRESS 4 TO ADD  
SELECT YOUR CHOICE  
Use the switch statement (12 marks)
- b) Explain the THREE types of control structures used in programming, demonstrate your answer by use of flow chart (8 marks)

**Question Five**

- a) Develop a C program to read twenty integer then calculate sum and average. Use the WHILE loop (8 marks)
- b) Explain the term data structure as used in programming (2 marks)
- c) (i) Explain the term array (2 marks)
- (ii) Develop a C program to read ten values, compare them and display the largest (8 marks)