



# THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

*Faculty of Engineering & Technology*

**DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY**

UNIVERSITY EXAMINATION FOR BACHELOR OF TECHNOLOGY IN INFORMATION  
COMMUNICATION TECHNOLOGY (BTIT/JAN2012/J-FT)

**EIT 4102: FUNDAMENTALS OF PROGRAMMING**

END OF SEMESTER EXAMINATION

**SERIES:** APRIL 2012

**TIME:** 2 HOURS

## **Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions in **TWO** sections **A & B**

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

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

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## **SECTION A (COMPULSORY)**

### **Question One (20 Marks)**

- a) What is a program? Why is a program important to computer? Explain (4 marks)
- b) Define the term language translator and give **TWO** examples of a language translator that exist in this world (2 marks)
- c) Give the **FOUR** types of errors that a programmer encounters when writing code (4 marks)
- d) (i) Define the term variable and explain why a variable is important in a program  
(ii) Is declaring a variable in C important? Explain (4 marks)
- e) Write a program that accepts the weight and the height of a person and using the table below that displays the corresponding comment as per the values of the weight and height of the person.
- f)

Weight	<65 kg	>=65 kg
Height		
<1.5m	Normal	Over – weight
>=1.6m	Under – weight	Normal

- g) Define the term structure as used in C. As you define, give the general syntax of a structure (3 marks)
- h) What do we mean by the term comment as used in programming? Explain. As you explain, give the general syntax for each of the two forms of a comment in C. (3 marks)

## SECTION B (Attempt any TWO sections)

### Question Two (20 marks)

- a) (i) What is pre-processor in C? Explain  
(ii) Briefly explain what we mean by the term pre-processor directive. Give the FOUR types of pre-processor directive (8 marks)
- b) (i) Define the term control structure  
(ii) Distinguish between the two control structures; selection structure and iteration structure.  
(iii) An infinite loop structure is a variant of the indefinite loop structure. With the aid of an example explain this fact (8 marks)
- c) Write a program that will display the first 20 terms of the series below using a four loop  
21 41 61 81... (4 marks)

### Question Three (20 marks)

- a) (i) Define the term array and give the general syntax of declaring an array (3 marks)  
(ii) We say that arrays in C are zero indexed data structures. What do we mean by this statement? What are its implications when it comes to referencing array elements? Explain.
- b) Write a program to read data items into each of two integer arrays X and Y of size 20. Compare each of the elements of X to th corresponding element Y. In the corresponding elements of a third array Z, store:
- +1 If X is larger than Y  
1 If X is equal to Y  
-1 If X is less than Y

Print the number of elements of X that exceeds Y, and the number of elements that are less than Y. (15 marks)

### Question Four (20 marks)

- a) (i) How does C implement a subroutine since we know that the basic structure of a C program is a function? Explain.  
(ii) The return type for a function in C is optional. What data type does it default to when we decide not to include a return type in a function definition? Outline  
(iii) Give the general syntax of function definition. As you outline, briefly explain the major parts of your syntax (8 marks)

- b) Write a function definition that accepts as its arguments; an array of integers values and the size of the array. The function should scan the array and determine the position (note: not the index) of the element in the array having the smallest value. The function should return the position of the element that has the smallest value. Hint the function header may be as follows:

```
Int scannaary (int a[], int size
```

 (12 marks)

### Question Five (20 marks)

- a) (i) Define the term pointer and give the syntax of declaring one.
- (ii) What does it mean to reference and deference a pointer? As you explain give the general syntax for each
- b) (i) Outline the **TWO** ways we reference a structure member element. As you outline give the general syntax.
- (ii) Define a structure type that contains a person's name consisting of a first name and a second name, plus the person's phone number. Use this structure in a program that will allow one or more names and corresponding numbers to be entered and will store the entries in an array of structures. The program should allow a second name to be entered and output all the numbers corresponding to the name, and optionally output all the names with their corresponding numbers. (12 marks)