



TECHNICAL UNIVERISTY OF MOMBASA

# Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR:  
BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY (BSIT 13S)

**BIT 2104: INTRODUCTION TO PROGRAMMING & ALGORITHMS**

END OF SEMESTER EXAMINATION

**SERIES: DECEMBER 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 (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) Explain the following statements: **(2 marks)**
- (i) Switch statement
  - (ii) Break statement
- b) Using a switch develop a calculator that prompt the user to input two operands and an operator to process. **(2 marks)**
- c) Define the following programming terms:
- (i) Modular programming **(2 marks)**
  - (ii) Algorithm **(2 marks)**
  - (iii) Pre-processor directives **(2 marks)**
- d) Using examples, explain the getch () function **(4 marks)**

- e) Develop a program of water beard that charges the following rates to domestic users to discourage large consumption of water. For the first 200 cubic units – 50 per cubic unit  
Beyond 400 cubic units – 60 per cubic unit  
If the total cost is more than kshs 500.00 then an additional surcharge of 15% is added on the difference a good program **(10 marks)**

### Question Two

- a) Differentiate between structured programming and unstructured programming **(4 marks)**
- b) Write a program that performs the following:  
(i) Define an array called grades of size 20 and type int  
(ii) Read 20 different values inside the array. The reading process should be done using loop. The values should be in the range of 0 to 100 inclusive  
(iii) Calculate the average of the grades  
(iv) Calculate the highest grade **(12 marks)**
- c) Write a program to evaluate the number entered, as a even odd or a zero. **(4 marks)**

### Question Three

- a) Define the term “function” as used in programming and list different types of in built functions. **(4 marks)**
- b) Using and function and a case selection statement write a program to calculate the area of a circle, rectangle and cylinder **(10 marks)**
- c) Differentiate between:  
(i) Pass-by-value and pass-by-reference  
(ii) Function calla and function prototype **(6 marks)**

### Question Four

- a) There are FOUR men want to cross to bridge. They all begin on the same side. IT is night. There is one flashlight. A maximum of two people can cross at one time. Any party who crosses either 1 or 2 people must have the flashlight with them. The flashlight must be walked back and forth, it cannot be thrown etc. Each man walks at a different speed. A pair must walk together at the rate of the slower man’s pace.  
(i) Man 1:1 minute to cross  
(ii) Man 1:2 minutes to cross  
(iii) Man 3: 5 minutes to cross  
(iv) Man 4:10 minutes to cross **(3 marks)**
- b) In crement, the variable count using three different ways **(3 marks)**
- c) Outline the relationship between problem solving and computer programming **(4 marks)**
- d) Differentiate between to-down and bottom-up decomposition. **(4 marks)**

### Question Five

- a) Differentiate between Local variable and Global variable by giving suitable C/C++ code. **(6 marks)**
- b) Write a program that ask for user input from 15 to 35 then calculate the average **(8 marks)**
- c) Briefly describe the major stages of a program Development Life Cycle **(6 marks)**