THE TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY
(BSC.IT S12)

BIT 2104: INTRODUCTION TO PROGRAMMING & ALGORITHMS

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: FEBRUARY 2013
TIME: 2 HOURS

<u>**Instructions to Candidates:**</u>
You should have the following for this examination
- *Answer Booklet*

This paper consist of **FIVE** questions
Answer 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

Question One (Compulsory)

a) Define the following programming terms:
   (i)   Syntax
   (ii) Algorithm
   (iii) Pre-processor directives.   **(6 marks)**

b) List the rules of naming a variable.   **(8 marks)**

c) Outline the relationship between problem solving and computer programming.   **(4 marks**)

d) Draw a flowchart to:
   (i)   Read an employee name (NAME), overtime hours worked (OVERTIME) hours absent (ABSENT)

(ii) Determine the bonus payment (PAYMENT) as follows and;

Bonus Schedule	
OVER TIME (2/3) * ABSENT	**Bonus Paid**
> 40 hours	Ksh 500
≤ 40*hours* > 30 but	Ksh 400
≤ 30*hours* > 20 but	Ksh 300
≤ 20*hours* > 10 but	Ksh 200
≤10*hours*	Ksh 100

(iii) Develop the program using C++ **(6 marks)**

e) List and explain any **FOUR** qualities of a good program. **(4 marks)**

Question Two

a) Give examples in each case, list the different types of programming language and outline the key features that marked the each programming language. **(16 marks)**

b) List at least one advantage and disadvantage of the different of programming languages.
(4 marks)

Question Three

Draw a flowchart that:

(i) That reads name rate and hours, and the calculate total salary for ten employees given salary = Rate x Hours. **(5 marks)**

(ii) Find and display the greatest common divisor (GCD) of any given two positive integers.
(5 marks)

(iii) Describe the major stages of a program development life cycle. **(10 marks)**

Question Four

a) What is the use of control structures in a program? **(2 marks)**

b) With the help of a appropriate examples, discuss three categories of control structures.
(12 marks)

c) Differentiate between top-down and bottom-up decomposition. **(4 marks)**

Question Five

a) Write a program that performs the following:
(i) Define an array called grades of size 20 and type it
(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)**

b) Print the name of an input number if it is a digit, if it is not inform the user that the number is not a digit. **(8 marks)**