THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSTITY EXAMINATION FOR BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING **(BSc. ME Y2 SEM I)**

BACHELOR OF ENGINEERING IN MECHANICAL ENGINEERING **(BEng. ME YR 2 SEM I)**

ICS 2175: COMPUTER PROGRAMMING I (C)

END OF SEMESTER EXAMIANTION
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 **TWO** printed pages

SECTION A (COMPULSORY)

Question One (30 Marks)

a) Provide definitions for the following terms/phrase
   (i) System program
   (ii) Application program
   (iii) Programming
   (iv) Algorithm (4 marks)

b) Define a function that can be used to get the greater of two numbers (2 marks)
c) Write a C program that uses the function in b and output the results (5 marks)
d) Formulate an algorithm to calculate average of three numbers (4 marks)
e) Represent the algorithm in (d) using a flow chart (3 marks)
f) Write a C program to implement the formulated algorithm in (e) (3 marks)
g) Write a C program that uses an array to store the marks of five students and outputs the results (6 marks)
h) List **THREE** applications of comments in programming (3 marks)

SECTION B (Attempt any TWO sections)

Question Two (20 marks)

a) What is a function prototype? (2 marks)
b) Write a C program that uses a function prototype to calculate the mean of two numbers (5 marks)
c) List **THREE** advantages of using functions in programming (3 marks)
d) Differentiate between static, local and global variables. Use computer code (6 marks)
e) Define the term recursive function (1 mark)
f) Write a recursive function that can be used to get the factorial of a number (3 marks)

Question Three (20 marks)

a) Demonstrate the use of the following in built functions
Strupr()
Strcpy()
Strlen (6 marks)

b) What is dynamic memory allocation? (2 marks)
c) Demonstrate dynamic memory allocation using C (3 marks)
d) Define a data file (2 marks)
e) Show how to set up a buffer area (2 marks)
f) Write a C program that opens a data file and reads the content (5 marks)

Question Four (20 marks)

a) Define the term variable scope (2 marks)
b) Outline with examples the difference between local variables and global variables (6 marks)
c) Write a C program that prompts the use for two names and outputs the results (5 marks)
d) Declare a structure variable called samba of type DOG with at least four member elements, one of which should be an array and another a pointer (5 marks)
e) What do you understand by the term recursive function (2 marks)

Question Five (20 marks)

a) What is stepwise refinement? (2 marks)
b) Describe the process of stepwise refinement (4 marks)
c) List **FOUR** advantages of stepwise refinement (4 marks)
d) Write a C program that prompts the user for students marks and displays grade A if marks is > 70, B if marks greater than 60 but less than 70, C is marks greater than 50 but less than 60, D if marks greater than 40 but less than 50 and F, if marks less than 40. (10 marks)