MERU UNIVERSITY COLLEGE
OF SCIENCE & TECHNOLOGY

P.O. Box 972-60200 Meru - Kenya. Tel: 020-2092048, 020 2069349
Fax: 020-8027449

University Examinations 2010/2011

YEAR ONE, SECOND SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE COMPUTER SCIENCE

ICS 2103: INTRODUCTION TO SYSTEMS PROGRAMMING

DATE: DECEMBER 2010   **TIME: 2 HOURS**

INSTRUCTIONS: *Answer Questions One and any other Two Questions*

QUESTION ONE – (30 MARKS)

(a) Give three uses of pointers.   (3 Marks)

(b) List and briefly describe atleast three string manipulation functions in C.   (6 Marks)

(c) With an example, show how arrays are;

    (i)   Declared   (2 Marks)

    (ii)   Initialized   (2 Marks)

(d) Write a C function that accepts two integer digits and swaps them.   Parameter passing should be done using pointers.   (4 Marks)

(e) Give Two advantages of storing elements in a linked list rather than array. (4 Marks)

(f) Write a program segment to demonstrate a system call.   (3 Marks)

(g) Giving examples, explain what you understand from the following terminologies used in programming.   (4 Marks)

    (i) Recursion

    (ii) Array of structures.

(h) Declare a structure that can be used to implement a linked list.   (2 Marks)

QUESTION TWO – (20 MARKS)

(a) When a C program is loaded into memory, it is organized into three areas of memory. Name and with the aid of diagrams describe them.   (9 Marks)

(b) Give Two library functions in C that are used for dynamic memory allocation and deallocation and using an example, demonstrate how they do it.   (6 Marks)

(c) (i) What is a function pointer?   (2 Marks)

(ii) Declare a function pointer and assign it a pointer variable.   (3 Marks)

QUESTION THREE – (20 MARKS)

(a) Write a function that adds the elements of two different arrays and stores them in the third array.   (6 Marks)
(b) Write a function which returns true if the string parameter is a palindrome. (6 Marks)
(c) A certain Company has decided that as part of their social responsibility, they will donate a percentage of their monthly profits every month to a charity. You have been contracted to write a function which will be called by the main accounting system.

   Write a function donateCharity(0) which modifies parameter **profits** so that the profits for each month are reduced by a percentage and assigns the money to parameter **charity.**
                                                                        (8 Marks)

QUESTION FOUR – (20 MARKS)

(a) Given a text file "Scores.txt" that contains a list of integers. The first line of the file is a number ,n, that tells how many subsequent lines are in the file. You are required to write a function that opens the file for reading, and then reads values from the file and computes the average of the integers. The function should return the average in a parameter passed to the function. The function should be called using the statement computeAverage(avg)   (8 Marks)
(b) Briefly describe what is meant from the term endless loop and how it can be avoided.
                                                                        (3 Marks)
(c) Declare TWO arrays; **stuID** containing a list of all students' IDs, and array **stuScores** containing a list of the same students' scores.   (4 Marks)
(d) Convert the following code fragment to switch statement.   (5 Marks)
   If(x>0 &&x<=3)
   y= y +1;
   else if (x= = 4)
   y=y+2;
   else if(x>4 &&x<=6)
   y=y + 3;
   else y=4;