MURANG'A UNIVERSITY COLLEGE

(A Constituent College of Jomo Kenyatta University of Agriculture and Technology)

University Examinations 2014/2015

YEAR ONE SEMESTER ONE EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

BIT 2123: STRUCTURED PROGRAMMING

COURSE: BSCIT **DURATION: 2 HOURS**

DAY/TIME: WED 8.30 – 10.30 AM **DATE: 22/04/2015**

Instructions: Answer Question One and Any Other Two

QUESTION ONE (30 Marks)

a) Looping assists a programmer to implement a programming logic at ease. Using suitable examples explain any three looping statements in C programming. (6Marks)

b) Distinguish between a variable and a constant (4Marks)

c) Explain four common data types used in C language. (4Marks)

d) Declare and initialize an array called AVERAGES to contain the following averages;

36.20	30.00	67.20	100.00
53.65	93.50	45.60	21.90
20.70	45.30	67.30	78.36
92.45	35.90	67.45	90.45

(4Marks)

e) State reasons why one would use an unsized array in C (2Marks)

f) Explain the difference between Call by value and call by reference (2 Marks)

g) Write the general format of the IF……..THEN …….ELSE control structure 3 marks

h) A program is required to calculate the volume of a cylinder. It is required that base area be calculated using a function **basearea()** and its return value be used in the **main()** to calculate the volume. Implement this in C language. (5 Marks)

QUESTION TWO(20 Marks)

a) State the function of each of the following special character sequences used in C

i. \n (1Marks)

ii. %.2f (1Marks)

iii. && (1Marks)

b) A retail shop offers discounts on its merchandise to its customers as indicated in the table below;

Purchase amount	**Discount (%)**
>10,000	10
< = 10,000 and > 7,000	5
< = 7,000 and > 5,000	3
<= 5,000	0

Write a program to calculate and display the amount payable by a customer (6Marks)

c) Using some code segment differentiate between the following

i. Iteration and recursion (4 Marks)

ii. Function definition and function prototype (4 Marks)

d) With use of program segments differentiate between global and local variables as used in programming. (3 Marks)

QUESTION THREE (20 Marks)

a) Write a C program to create an array of structure to store the details of almost 100 employees. Employee details are as follows:

-Employee Name

-Employee ID

-Employee Salary (6 Marks)

b) Write single line statements to accomplish the following

i. Prompt the user to enter an integer. End your prompt message with a semicolon.
ii. Read an integer from the keyboard and assign it to variable “num”.
iii. If the variable "Num” is not equal to 7, print “value not 7”.
iv. Print the message “this is a C program”, on two lines where the first line ends with C.
v. Declare a 15 character string called “grade” (5 Marks)

a) Using one statement for each and some explanation, illustrate how the following string functions are implemented.

i. Strcpy()
ii. Strcat()
iii. Strcmp()
iv. Strlen() (4 Marks)

b) What do you understand by operator precedence? Suppose p, q and r are integer variables that have the values p=8, q=3 and r=-5. x, y, and z, are floating point variables with values x=8.8,y=3.5 and z=-5.0. Determine the value of each of the following expressions.

i. P/q

ii. 3*q-3*(p-r)

iii. (X/y)+z

iv. X%y

v. (P*r)%q (5 Marks)

QUESTION FOUR (20 Marks)

a) Use a *for loop* to write a C program to find the sum of odd and the sum of even numbers between 1 and 100. (6 Marks)

b) Explain the advantages of functions in structured programming (2 Marks)

c) Rewrite the following program statement using the switch statement

```
if (x==1)
{
printf ("x is 1");
}
else if(x==2)
{
printf ("x is 2");
} else
printf ("value of x unknown");
```

(5 Marks)

d) A program prompts for the principal amount (float), and the time in years (integer) and uses this to calculate the gross profit. The gross profit is calculated as: principal amount x rate x time

The rate is based on the time entered as follows:

1 Year = 0%

2 Years = 2%

3 Years = 3%

4 Years = 5%

5 years and above 8%

Create a program to prompt for the relevant input, calculate and display results (7 Marks)