EGERTON UNIVERSITY

UNIVERSITY EXAMINATIONS

NJORO CAMPUS

2012/2013 ACADEMIC YEAR

SECOND YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE

COMP 200-INTRODUCTION TO STRUCTURED PROGRAMMING.

STREAM: **TIME:** 2 HOURS

DAY: TUESDAY, 8.30 – 11.30 AM **DATE:** 20/8/2013

SECTION A. (Compulsory)
Answer all questions in section A.

QUESTION ONE (30 MARKS)

1) If the marks obtained by a student in five different subjects are input through the keyboard,find out the aggregate marks and percentage marks obtained by the student.Assume that the maximum marks that can be obtained in each subject is 100.Write a program to show the above. **[2 marks]**

2) Given two integers 20 and 10 ,write a program that uses a function add( ) to add these two numbers and sub( ) to find the difference of these two numbers and then display the sum and the difference in the following form

   a. 20+10=30
   b. 20-10=10 **[4 marks]**

3) Determine the value of each of the following logical expressions if a=5,b=10 and c=-6
   1. **a>b&&a<c**
   2. **a<b&&a>b**
   3. **a==c||b>a** **[3 marks]**

4) Explain four types of constants used in C language citing examples of each **[4 marks]**

5) Explain the rules for defining variables. **[2 marks]**

6) In a town,the percentage of men is 52.the percentage of total literacy is 48.If total percentage of literate men is 35 of the total population, Write a program to find the total number of illiterate men and women if the population of the town is 80,000.

[5 marks]

7) Given the values of three variables a, b and c, write a program to compute and display the value of x where

$$x=(ac + b)/(c - a)$$

Execute your program for the following values and comment on the output in each case.

(a) a=250, b=85, c=25
(b) a=300, b=70, c=70 **[6 marks]**

8) Assuming that n is 20, what will the following code fragment output when executed? **[4 marks]**

```
if (n >= 0)
        if (n < 10)
                printf << "n is small\n";
else
        printf << "n is negative\n";
```

SECTION B (40 marks)
Answer any TWO questions. Each question carries equal marks.

QUESTION TWO (20 MARKS)

1) Explain 3 data types citing example of each as used in program formulation **[6 marks]**
2) Given the values of the variables x, y and z.write a program to rotate their values such that x has the value of y,y has the value of z, and z has the value of x. **[4 marks]**
3) If a five digit number is input through the keyboard,write a program to print a new number by adding one to each of its digits.For example if the number that is input is 12391 then the output should be displayed as 23402 **[4 marks]**
4) Explain how to declare and initialize pointers in C **[4 marks]**
5) Write a structure in C with the name student, declare the appropriate variables, then define it. **[2 marks]**

QUESTION THREE (20 MARKS)

1) Given an integer number, write a program that displays the number as follows:

First line : all digits
Second line :all except first digit
Third line :all except first two digits
.....
.....
Last line :The last digit

For example, the number 5678 will be displayed as
5678
678
78
8

[6 marks]

2) Define a function and distinguish between pre- defined and user defined functions **[4 marks]**

3) Using a simple program explain the following
   a. Call by value
   b. Call by reference

[4 marks]

4) An election is contested by 5 candidates. The candidates are numbered 1 to 5 and the voting is done marking the candidate number on the ballot paper. Write a program to read the ballots and count the votes cast for each candidate using an array variable count. In case a number read outside the range of 1 to 5,the ballot should be considered a "spoilt ballot" and the program should also count the number of spoilt ballots. **[6 marks]**

QUESTION FOUR (20 MARKS)

1) Convert the following while statement into a for statement **[5 marks]**

```
While (scanf ("%f " , &x) = = 1)
{
Number ++;
Sum = sum + x;
}
Average = sum / number;
```

[4 marks]

2) A company insures its drivers in the following cases:

If the driver is married
If the driver is unmarried, male & above 30 years of age
If the driver is unmarried, female & above 25 years of age

In all other cases the driver is not insured. If the marital status,s ex and age of the driver are the input, write a program to determine whether the driver is insured or not

[6 marks]

Required:

Given the marks in the three subjects, write a program to access the applications to list the eligible candidates. **[6 marks]**

i. What will be the result of evaluating the following expression? int m = 1, n = 2;
int min = (m < n ? m : n);

[2 marks]

3) Explain how to declare and initialize pointers in C **[2 marks]**

QUESTION FIVE (20 MARKS)

1) Explain array initialization and array declaration **[4 marks]**

2) Write a For statement to print the following.
   a. 1, 2, 4, 8, 16, 32
   b. 1, 3, 9, 27, 81, 243
   c.
   ```
   *
   **
   * **
   * * * *
   * * * * *
   ```
   [6 marks]

3) Write a program that requests two float type numbers from the user and then divides the first number by the second and display the result along with other numbers.

[4 marks]

4) write a function to compute and print the weekly pay for a worker. All workers are paid an hourly rate and salary is based on hours times rate. Any work done in excess of 40 hours, is paid at 1.5 times the normal rate.

[4 marks]

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