DAYSTAR UNIVERSITY
SCHOOL OF SCIENCE, ENGINEERING, AND HEALTH
COMPUTER SCIENCE   DEPARTMENT
FINAL EXAMINATION JANUARY 2019 SEMESTER
ACS113-MIS113: STRUCTURED PROGRAMMING

DATE: MAY 2019   **TIME: 2 HOURS**

INSTRUCTIONS:
 Answer all questions in section I and any two in section II   **Total Marks: 70**

Section I: **30 Marks**

Question One

a. Define the following programming terms and give examples of their application in C programming
    language: **(5 marks)**
          i.   Variable
         ii.   String
        iii.   Keyword
         iv.   printf
          v.   scanf

b. State the **FOUR** stages of program implementation in C.   **(4 marks).**

c. Study the following scenario and answer the questions that follow:

*A carpenter needs a program that computes the price of any desk that a customer orders based on the following
input fields: desk length , desk width , type of wood (M for mahogany, O for Oak, and P for pine) and number
of drawers. The price of the desk is computed as follows:*

1. *The minimum charge for all desks is ksh200*
2. *If the surface(length *width) is over 750 , then additional surface charge is ksh50*
3. *If the wood is "mahogany" then additional wood charge is ksh. 150; if it is "oak" then additional wood
    charge is   ksh125. No additional wood charge is added for "pine" wood.*
4. *An additional drawer charge of ksh 100 is charged for every drawer in the desk.*

*The program then computes the Total charge which includes the minimum charge, the surface charge, the
wood charge and the drawer charge. Finally it displays the Total charge of the desk, the length, width,
surface charge, wood charge, and drawer charge.*

    i.   Draw a flowchart to design the algorithm program solution for the scenario' **(6 marks)**

  ii.   Write a pseudocode to design the algorithm program solution for the scenario.**(6 marks)**

 iii.   Write the code for the above program in C language.   **(9 marks)**

Section II: Answer any TWO questions in this section   **40 marks**

Question Two   **20 marks**

  a. Explain the **THREE** programming structures that form the logic of programming. **(6 marks)**

  b. Explain the purpose of functions in programming.   **(2 marks)**

  c. Write a C statement that declares an array that holds salaries for 150 employees.   **(3 marks)**

  d. Write a program in C that reads in an item name and the price. The program then displays the item name and the price.   **(5marks)**

  e. Write a FOR loop that enables the user to keep entering in the item name and the price and displaying the details, 100 times.   **(4 marks)**

Question Three   **20 marks**

  a. Discuss the **TWO** types of statements in C declares a constant. Use PI 3.14 as an example.

          (2 marks)

  b. Define a data type and give an example in C.   **(3 marks)**

  c.   Write the following program in C language:

The program reads in item name and price. The program then computes the discount as follows: if the price is above 1000, the discount is 10% else the discount is 5%. The program then computes the final price as the price less discount. The program should display the item name, price, discount and final price.   **(15 marks)**

Question Four   **20 marks**

  a. Differentiate between a local and global variable.   **(3 marks)**

  b. State the when the *do .. while* loop is most applicable.   **(2 marks)**

  c. State when the *while.*.loop statement is most applicable   **(2 marks)**

  d. Write a C program that displays your firstname on the first line and surname on the second line

          (4 marks)

e. List the **THREE** logical operators and state their meanings as used in C programming.

(3 marks)

f. Trace through the following C program. Assume it compiles and executes. Write the exact output as it will appear on screen. **(6 marks)**

```c
#include <stdio.h>

int wrap(int a)
{
   int y=100;
   printf("the value of y is %d\n",y);
   if(a>y)
     y=a;
   else
     y=y+a;

   return y;
}

int main()
{
   int num1, answer;
   num1=60;
   answer=wrap(num1);
   printf(" the value is now %d\n",answer);

   return 0;

}
```