DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY

University Examinations 2020/2021

FIRST YEAR **SEMESTER** 2 EXAMINATION FOR THE DEGREE OF **BACHELOR OF SCIENCE IN EEE and BED**

CCS 2101: Computer programming 1

DATE: APRIL 2020   TIME: 2 HOURS

Instructions: Answer Question 1 and Any Other Two.

<u>**Question 1: (30 Marks)**</u>

(a) Distinguish between each of the following pairs of terms   **[4 Marks]**

   I) Operator and operand

   II) Source code and object code

(b) Explain the meaning of the following terms   **[6 Marks]**

   I) Pseudo code

   II) Compiler

   III) Algorithm

(c) What are **keywords** in a programming language?Give an example.   **[2 Marks]**

(d) Sample the following code snippet and answer the following questions:

```
int n[5]={32,27,64,18,25};
int i;

    printf("%s%13s\n", "Element", "Value");
    /*Output contents in tabular format */

    For (i=0; i<10; i++)
    {
    Printf(%7d%13d\n, i, n[i]);
    }
```

   I) Write the output of the program   **[3 Marks]**

   II) What is the purpose of the literals - %s%13s\n in the program?   **[2 Marks]**

(e)   Briefly describe the difference between each of the following pairs of operators as used in C language: **[6 Marks]**

I)   /= and +=

II)   = = and !=

III)   && and ||

(f)   Why is linking necessary in a C program?   **[2 Marks]**

(g)   Describe the use of the **printf()** and the **scanf()** methods used in a C program   **[3 Marks]**

(h)   Explain the meaning of each of the following function prototypes   **[2 Marks]**

I)   int f(int a);

II)   void g(long a, short b);

Question 2: (15 Marks)

a)   What is a pointer?   **[1 Marks]**

b)   Draw a flowchart to illustrate the following program: **[4 Marks]**

```
#include<stdio.h>
void main()
{
    int  mark;
    printf("\n Enter the mark: \n");
    scanf("%d", &mark);
    if(mark < 40)
      printf("\n You have failed! \n");
    else
      printf("\n You have passed!\n");
}
```

c)   C Language statements, labels, arrays e.t.c. are separated by special characters known as delimiters. Enumerate the use of the following delimiters in C language construct   **[4 Marks]**

   i.   #

   ii.   [ ]

   iii.   { }

   iv.   ;

d) Suppose a, b, c are integer variables that have been assigned the values a = 8, b and c = - 5. x, y, z are floating point variables with values x = 8.8, y = 3.5, z = - 0.5

Determine the value of each of the following expressions: **[6 Marks]**

    i. (x / y) + z

    ii. 2 * b + 3 * (a – c)

    iii. (a * c) % b

Question 3: (15 Marks)

a) Write down the program that will declare an initialized array of FIVE integer elements and uses the for statement to add up all the elements. The total should be displayed to the user.

[4 Marks]

b) Rewrite the following program using the switch construct   **[5 Marks]**

```
#include<stdio.h>
main()
{
 char grade;
printf("Enter the Grade:");
scanf("%c", &grade);
if(grade == 'A')
  printf("Excellent !\n");
else if(grade == 'B')
 printf("Good !\n");
else if(grade == 'C')
 printf("Fair !\n");
else if(grade == 'D')
 printf("Poor !\n");
else if(grade == 'E')
 printf("Very Poor !\n");
else
 printf("Wrong Entry !, Enter a grade between A – E \n");
}
```

c) Write a declaration of a structure called **account** with account_number, first_name last_name and balance as its fields   **[2 Marks]**

d) With the aid of a diagram, briefly illustrate the compilation process of a C program

[4 Marks]

Question 4: (15 Marks)

a) Distinguish between the indirection operator (*) and the address operators (&) as used with pointers **[3 Marks]**

b) Give the meaning of the following components of a C program **[4Marks]**

i) Preprocessor directive

ii) Declaration

iii) Comment

iv) Header File

d) What is the output of the following program? **[3 Marks]**

```
#include<stdio.h>
main()
{
 int pica = 0, delta = 0;
While(pica <= 20)
 {
 if(pica % 5 == 0)
 {
   delta += pica;
   printf("\n %d ", delta);
 }
 delta++;
 }
}
```

e) Body Mass Index is calculated by dividing a person's weight (in kgs) by the square of their height (in meters). Write a program in C that asks a person for his/her weight, calculates the body mass index and displays it. **[5 Marks]**