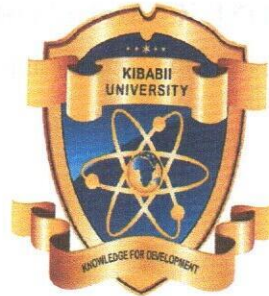


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*(Knowledge for Development)*

**KIBABII UNIVERSITY  
(KIBU)**

**UNIVERSITY EXAMINATIONS  
2022/2023 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS  
FIRST YEAR SECOND SEMESTER**

**FOR THE DIPLOMA IN  
(INFORMATION TECHNOLOGY)**

**COURSE CODE : DIT 058**

**COURSE TITLE : INTRODUCTION TO  
PROGRAMMING**

**DATE: 27/04/2023 TIME: 2.00A.M.- 4.00A.M. 2HRS**

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**INSTRUCTIONS TO CANDIDATES  
ANSWER QUESTIONS ONE AND ANY OTHER TWO.**

## QUESTION ONE [COMPULSORY] [24 MARKS]

- a. Explain the following terms as used in C programming [4 Marks]
- Variable
  - Statement
  - Data type
  - Comment
- b. With the help of examples, explain the difference between local variable scope and global variable scope [4 Marks]
- c. Explain the difference between the following concepts
- Source code and object code [2 Marks]
  - High level language and machine language [2 marks]
- d. Explain three types of errors commonly made by programmers. [3 Marks]
- e. Write a C code excerpt that set grades in an examination. The student mark is stored in a variable named x. If a student gets above 70; grade is set to A, between 60 and 69; the grade is set to B, between 50 and 59; the grade is set to C, between 40 and 49; the grade is set to D and below 40 the grade is set to F. [5 marks]
- f. Evaluate the following expression on the basis of operator precedence (show your working) [1 mark]
- $$2*2+(17\%5)$$
- g. Write a C code segment that will read values from the keyboard and store them in the variables declared as shown below.
- int mark; [1 mark]
  - float salary; [1 mark]
  - char gender; [1 mark]

## QUESTION TWO [18 MARKS]

- a. What is a library as used in C programming? [2 Marks]
- b. Using flow charts, outline the difference between the **while** loop and **for** loop. Write a sample code for each to show how they are implemented in C. [6 Marks]
- c. Using a loop construct of your choice, write a code excerpt that will give the output below. [4 Marks]

\*

```
**
***
****
*****
*****
```

- d. Rewrite the following **for** loop as a **while** loop [4 Marks]

```
for(int i=1; i<=10; i++)
{
    if (i<5&& i!=2)
    {
        printf ("%d", i);
    }
}
```

- e. State *ANY TWO* rules that must be observed by variable names [2 marks]

### QUESTION THREE [18 MARKS]

- a. What is a function as used in C programming? [2 marks]
- b. Using illustrations, explain how a multiline comment and single line comments are represented in C. [3 Marks]
- c. The area of a circle is given by the formulae  $\text{Area} = \text{PI} \times \text{radius}^2$ . PI is a constant with its value being 3.14159. Write a C program that prompts the user to enter radius of the circle from the keyboard as a double, compute the area and display it on the screen. [6 Marks]
- d. Write the output of the C code segment below. [3 marks]

```
int x=1;
int sum=3;
sum+=x;
x++;
printf ("%d", x);
printf ("%d", sum);
```

- e. State and explain any **TWO** benefits of functions. [4 marks]

### QUESTION FOUR [18 MARKS]

- a. Using an example explain what is meant by a symbolic constant in C. [3 Marks]
- b. What is the output of the C code excerpt below? Explain your answer. [4 Marks]

```
1. int a=9;
2. int b=7;
3. if (a<b) {
```



```

4. b=a;
5. a*=3;
6. printf ("%d", a);
7. }
8. else if (a%3!=1) {
9. printf ("%d", a);
10. }
11. else {
12. int c=a+b;
13. printf ("%d", c);

```

- c. Explain what a pointer is in C programming. Show how it is declared in C. [ 3marks]
- d. Differentiate between a function prototype and a function definition. [2 marks]
- e. Write a function named **maximum** that will return the maximum of three variables; **a, b, and c** all of type **int** as a **float**. [3 marks]
- f. Explain **ANY FOUR** advantages of modular programming. [3 marks]

#### QUESTION FIVE [18 MARKS]

- a. Explain what is an algorithm. [1 Mark]
- b. With examples, explain the differences between an array and linked-lists. [4 Marks]
- c. Write a C program that displays the marks of five students in 3 subjects. Marks are stored in a two-dimensional array called **marks**. Display the sum and average of each student. [5 marks]
- d. An array is declared as **matrix [6][3]**.
- How many elements can be stored in this array? [1 mark]
  - What is the reference of the 5<sup>th</sup> element in the array? [1 mark]
  - What is the reference to the 14<sup>th</sup> element in the array? [1 mark]
  - Write a C statement that initializes the 7<sup>th</sup> element in the array with the value 56. [1 mark]
- e. Write a function in C that receives two integers and return the Greatest Common Divisor (GCD) of the two integers. [4 marks]