



*(Knowledge for Development)*

**KIBABII UNIVERSITY**

**(KIBU)**

**UNIVERSITY EXAMINATIONS  
2022/2023 ACADEMIC YEAR**

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

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

**COURSE CODE: DIT 066**

**COURSE TITLE: PROCEDURAL PROGRAMMING**

**DATE: 22/12/2022**

**TIME: 9.00 A.M – 11.00 A.M**

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**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTIONS ONE AND ANY OTHER TWO.**

**QUESTION ONE (COMPULSORY) [24 MARKS]**

- a) Define each of the following as used in computer programming; [2 Marks]  
 i. Variable  
 ii. Constant
- b) Fill the following table by describing what each of the escape characters will do [3 Marks]

Escape Character	Description
\n	
\t	
\a	

- c) Write the function divideBy(s,t) which returns the result of dividing s by t (Warning; division by 0 illegal) [3 Marks]
- d) A variable can be any sequence of characters that may include: a-z, A-Z, 0-9 and \_ additionally a variable name must be unique within its scope and is case sensitive. State three other rules that a variable must follow. [3 Marks]
- e) Given the code below,

```

1:    #include <iostream>
2:
3:    int Main()
4:    {
5:
6:    for(int i=0;i<5;i++)
7:    {
8:        cout<<"Hello, World!\n";
9:
10:   }
11:   return 0;
12:   }
    
```

- i. Identify the line(s) and state the type of error which may result when the program is compiled and executed. [1 Marks]
- ii. What is the use of #include statement? [1 Marks]
- iii. What will be the output of the program if the error is corrected? [2 Marks]
- f) How many \* does the following program segment print [3 Marks]

```

for(x=0;x<10;x++)
{
    for(y=5;y>0;y--)
    {
        cout<<"*";
    }
}
    
```

```
}

```

- g) Using an example show how you can declare a variable that stores a constant. [2 Marks]
- h) Give an outline for the general form of a programmer defined functions as used in C++ programming language. [4 Marks]

**QUESTION TWO [18 MARKS]**

- a) Many programmers plan their programs using a sequence of steps, referred to as the program development cycle. Explain the step-by-step process which will enable you to use your time efficiently and help you design error-free programs that produce the desired output. [4 Marks]
- b) An array is declared with the following statement  

```
char grapes[2][3];
```

  - i) What is the name of the array? [1 Marks]
  - ii) How many elements does the array have? [1 Marks]
  - iii) What data type does the array hold? [1 Marks]
  - iv) Modify the above array to hold three records but with the same number of elements as the original array. [2 Marks]
- c) Write a C++ program that will be able to produce the following result shown below. The program should accept only numbers between 1 and 10. [6 Marks]

Output of the program will appear as:

```
This program prompts you to enter 5 numbers
Each number should be from 1 to 10
Enter number 1 of 5:3
Enter number 2 of 5:6
Enter number 3 of 5:3
Enter number 4 of 5:9
Enter number 5 of 5:2
```

```
Value 1 is 3
Value 2 is 6
Value 3 is 3
Value 4 is 9
Value 5 is 2
```

- d) The following matrix represents the scores of 3 students(rows) in 5 tests (Columns)

34	45	43	89	34
89	56	98	34	55
67	87	45	43	95

Declare an array called marks to store the above scores. [3 Marks]

### QUESTION THREE [18 MARKS]

- a) The area of a rectangle is the product of the length and the width. Write a program that reads the length and the width of the rectangle from the keyboard, computes the area of the rectangle and displays the area on the standard output (screen monitor). [6 Marks]
- b) Rewrite the following while loops as for loops: [6 Marks]

i. 

```
int i=1;
while(i<=10)
{
    if(i<5 && i!=2)
        cout<<"*";
    i++;
}
```

ii. 

```
int j=100;
do
{
    cout<<"*";
    j=j+200;
}
while(j<1000);
```

- c) Write code using an if statement that assigns letter grades based on this 10 point scheme. [6 Marks]

if the numeric\_grade is not less than 90, the letter\_grade is an A,  
if the numeric\_grade is not less than 80, the letter\_grade is an B,  
if the numeric\_grade is not less than 70, the letter\_grade is an C,  
if the numeric\_grade is not less than 60, the letter\_grade is an D,  
if the numeric\_grade is not less than 0, the letter\_grade is an F,  
otherwise the letter\_grade is an X.

### QUESTION FOUR [18 MARKS]

- a) Define *Comments* in C++. [2 marks]
- b) Describe two main categories of comments as used in C++. [4 marks]
- c) C++ has been designed in such a way that data is handled efficiently; using examples, explain various data types that help in achieving the goal. [4 marks]
- d) Write an appropriate control structure that will take input *temp* from the user and Print following messages depending on the value assigned to *temp*. [4 marks]
- i) Ice, if value of *temp* is less than 0
  - ii) Water, if value of *temp* lies between 0 and 100
  - iii) Steam, if value of *temp* exceeds 100
- e) Explain the structure of for loop in C++? [4 marks]

**QUESTION FIVE [18 MARKS]**

- a) Write code segment to create a file named **temp.txt** if it does not exist. [3 marks]
- b) Write a simple program that writes *Welcome to C++ programming file operations.* to a file named *welcome.txt* [4 marks]
- c) Write a C++ program that reads the content in file above (*welcome.txt*) and display the results on the screen. [3 marks]
- d) What is a recursion? [2 marks]
- e) Factorial problem has been one of the hardest mathematical problems. Evaluate the efficiency of the use of recursion in calculating the factorial. [6 marks]