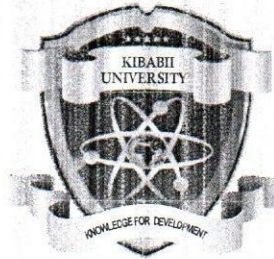


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(Knowledge for Development)
KIBABII UNIVERSITY
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UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR

SPECIAL/SUPPLEMENTARY EXAMINATIONS
FIRST YEAR SEMESTER TWO EXAMINATIONS

FOR THE DEGREE OF
(COMPUTER SCIENCE)

COURSE CODE : CSC 125
COURSE TITLE : PROCEDURAL PROGRAMMING

DATE: 28 / 09 / 2021 TIME: 02.00 P.M – 04.00 P.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE (COMPULSORY) [30 MARKS]

- a) Define each of the following as used in computer programming; [2 Marks]
- Variable
 - Constant
- b) Fill the following table by describing what each of the escape characters will do [4 Marks]

Escape Character	Description
\n	
\t	
\a	
\\	

- c) Write the function divide By(s,t) which returns the result of dividing s by t (Warning: division by 0 illegal) [6 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. [2 Marks]
- ii. What is the use of #include statement? [2 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 [20 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. [6 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 [20 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:

[8 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 50, the letter_grade is an F,
 otherwise the letter_grade is an X.

QUESTION FOUR [20 MARKS]

- a) Suppose you have the following function prototypes:

```
double answer(double data1, double data2);
```

```
double answer(double time,int count);
```

which function would be used in the following function call and why ? (x and y are of type double)

```
x=answer(y,6.0);
```

[4 Marks]

- b) Outline any two looping and two conditional structure and explain how they are implemented in C++. Illustrate each using a flow chart. [6 Marks]

- c) Write a C++ Statement that outputs the word *passed* provided the value of the variable exam is greater than or equal to 60 and also the value of the variable programs done is greater than or equal to 10. Otherwise, the statement output the word *Failed*. The variables exam and programs done are both of type int. [6 Marks]

- d) Transform the following *for* statement into a *while* statement. [4 Marks]

```
for(int counter=1;counter<=10;counter++)
```

```
{
```

```
    cout<<"\n"<<counter;
```

```
}
```

QUESTION FIVE [20 MARKS]

a) Write code segment to create a file named **temp.txt** if it does not exist. [4 Marks]

b) Given the following program, show the values of the array in the following figure:

[4 Marks]

```
#include<stdio.h>
int main()
{
    int values[5];
    for(int i=1;i<5;i++)
    {
        values[i]=i;
    }
    values[0]=values[1] + values[4];
    return 0;
}
```

After the array is created

0	
1	
2	
3	
4	

After the first iteration in the loop is done

0	
1	
2	
3	
4	

After the loop is completed

0	
1	
2	
3	
4	

After the last statement in the main method is executed

0	
1	
2	
3	
4	

c) How is function recursion different from looping?

[3 Marks]

d)

i. Declare (give a prototype for) a function named *average grade*. This function returns a double and has four double arguments, test1, test2, test3 and test4. The return value should be the average or arithmetic mean of the four arguments. [3 Marks]

ii. Define the above prototyped function and include a comment that tells *briefly* what the function does. [6 Marks]