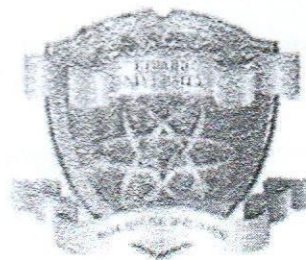


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(Knowledge for Development)

KIBABII UNIVERSITY
(KIBU)

UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR

SPECIAL/SUPPLEMENTARY EXAMINATIONS
YEAR ONE SEMESTER TWO EXAMINATIONS

FOR THE DEGREE OF
(COMPUTER SCIENCE)

COURSE CODE : CSC 125/121.
COURSE TITLE : PROCEDURAL PROGRAMMING

DATE: 29/07/2022 **TIME: 08.00 A.M – 10.00 A.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]**
- i. Variable
 - ii. 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 divideBy(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];
```

- What is the name of the array? [1 Marks]
- How many elements does the array have? [1 Marks]
- What data type does the array hold? [1 Marks]
- 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. [6 Marks]
The program should accept only numbers between 1 and 10.

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]
[8 Marks]

- b) Rewrite the following while loops as for loops:

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 [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)
[4 Marks]

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

- 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]
[4 Marks]

- d) Transform the following *for* statement into a *while* statement.

```
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]**