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(KNOWLEDGE FOR DEVELOPMENT)

**KIBABII UNIVERSITY
(KIBU)**

**UNIVERSITY EXAMINATIONS
2019/2020 ACADEMIC YEAR**

**SPECIAL/SUPPLEMENTARY EXAMINATIONS
SECOND YEAR FIRST SEMESTER**

FOR DIPLOMA IN

(INFORMATION TECHNOLOGY)

COURSE CODE: DIT 066

COURSE TITLE: PROCEDURAL PROGRAMMING

DATE: 29/01/2021

TIME: 10.00 A.M. -1.00 P.M.

INSTRUCTIONS

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

c. Describe the difference in the meaning of 5 in `int x[5]`; and the meaning of 4 in `x[4]`.

[4 Marks]

d. Write a for loop that counts how many times the number 17 appears in an array called `randomData` that has already been declared and initialized. The number of elements in the array is stored in an integer variable called `SIZE`.

[6 marks]

e. i. What is the output of the following code

[2 marks]

```
char symbol[3]={'a','b','c'};
```

```
for (int index=0; index<3; index++)
```

```
cout << symbol [index];
```

ii. If an array is declared as `int a[4] = {3, 0, 1, 2}`, then values assigned in `a[0]` and `a[4]` will be _____

[2 marks]

[8 marks]

- d. i. Define the term algorithm [2 marks]
- ii. Write an algorithm that can be used switch on air conditioner in a room if the room temperature falls below 5⁰C and switch it on when the temperature rises above 20⁰C.

[6 marks]

QUESTION FOUR [18 MARKS]

- a. What is function overloading? [2 marks]
- b. Write a function called sum that receives two integers and returns the sum of the two integers. [4 marks]
- c. Overload the function so as to receive three floats and return the sum of the three. [4 marks]
- d. Write the function *main ()* to show how the overloaded function would be called. Use comments to show which method is being called. [3 marks]
- e. Assume the existence of the following function definitions.

```
int times2(int x)
{
    return 2*x;
}
int sumOf(int x, int y)
{
    return x+y;
}
int halfOf(int x)
{
    return x/2;
}
```

What is the value in variable x after the following code has executed? [5 marks]

```
int m = 6;
int n = 9;
int x = halfOf(times2(sumOf(sumOf(2,times2(n)),halfOf(m)))) + 3*n;
```

Show how you arrived at your answer.

QUESTION FIVE [18 MARKS]

- a. Define the term array. [2 marks]
- b. Generally in C, when we pass an array as a parameter to a function, we must pass its size in another parameter as well. Explain why? [2 marks]

QUESTION TWO [18 MARKS]

- g. What is the value stored in variable x after following code has executed [2 marks]
`int a=10;`
`int x=++a +a;`
- a. Describe the three control structures used in C++ programming language. [6 marks]
- b. Rewrite the following if statement as an equivalent switch statement. The variable digit is of type int. [4 marks]
- ```
if (digit == 0)
 value = 3;
else if (digit == 1)
 value = 3;
else if (digit == 2)
 value = 6;
else if (digit == 3)
 value = 9;
```
- c. The decision table below shows fines imposed by NTSA for speeding violations. Write a code segment that assigns the correct fine to type double variable fine based on the value of type int variable speed. [6 marks]

| Speed (kph) | Fine (KSh) |
|-------------|------------|
| 100 or less | 0          |
| 101-112     | 5000.00    |
| 113-120     | 10000.00   |
| 121-128     | 20000.00   |
| over 128    | 50000.00   |

**QUESTION THREE [18 MARKS]**

- a. Give a general outline of a successful recursive function definition [2 marks]
- b. Distinguish between compiler and interpreter as used in computer programming [2 marks]
- c. Briefly state and explain what is actually involved in the programming process.

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

- a. Define the following terms with relevant example: [4 marks]  
i Algorithms  
ii Function
- b. Differentiate between do-while and while – statements using a flowchart [4 marks]
- c. Explain the distinction between call-by-value and call-by-reference. [4 marks]
- d. Show the printout of the following code:

- i. [2 marks]

```
#include <stdio.h>
void swap (int n1, int n2)
{
 int temp=n1;
 n1=n2;
 n2=temp;
}
int main()
{
 int a1=1, a2=2;
 swap(a1,a2);
 printf("a1 = %d a2 = %d", a1, a2);
 return 0;
}
```

- ii. [2 marks]

```
#include <iostream>
void swap (int a [])
{
 int temp = a[0];
 a[0]=a[1];
 a[1]=temp;
}
int main()
{
 int a[]={1,2};
 swap(a);
 printf("a[0] = %d a[1] = %d", a[0] a[1]);
 return 0;
}
```

- e. Write a function that computes simple interest when supplied with principal amount (p), interest rate (r) and period of investment (t). [4 marks]
- f. Write segment of code that reads two whole number into variable of type int, and then outputs both the whole number part and the remainder when the first number is divided by the second. [4 marks]