*(Knowledge for Development)*

# KIBABII UNIVERSITY

## (KIBU)

## UNIVERSITY EXAMINATIONS
## 2022/2023 ACADEMIC YEAR

## END OF SEMESTER EXAMINATIONS
## YEAR ONE SEMESTER ONE EXAMINATIONS

## FOR THE DEGREE OF BACHELORS OF SCIENCE
## (INFORMATION TECHNOLOGY)

**COURSE CODE** :  **BIT 113**

**COURSE TITLE** :  **FUNDAMENTALS OF PROGRAMMING**

**DATE: 23/12/2022**          **TIME: 9.00 A.M – 11.00 A.M**

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**INSTRUCTIONS TO CANDIDATES**

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

# QUESTION ONE [COMPULSORY] (30 MARKS)

a. Kibabii Mwalimu hostel has 12 rooms which the proprietor rents to Kibabii University students for Kshs 3000.00 per month. The landlady gives a discount based on how many months of rent a student pays at the beginning of a semester. If the payment is for 4 months, a 5% discount is given otherwise no discount is given. Assume that all the rooms are rented out at the beginning of a semester, design a pseudocode and a flowchart for a program that requests a user to enter the rental period for which payment has been made and calculate the total discount given and the total amount earned by the landlady in the first month of the semester. **[12 Marks]**

b. Write a C program that implements the pseudocode and flowchart in (a) above.

**[8 Marks]**

c. Explain any two differences between high level languages and low-level languages.

**[4 Marks]**

d. Distinguish between source code and object code as used in programming. **[2 Marks]**

e. Explain any two approaches used by programmers to improve the readability of a program.

**[4 Marks]**

# QUESTION TWO (20 MARKS)

a. Explain any two advantages of modular programming. **[4 Marks]**

b. Discuss any two differences between compilers and interpreters. **[4 Marks]**

c. Using well-labelled flowchart constructs, distinguish between **while** and **while .. do** loops as used in C programming. **[4 Marks]**

d. A program prompts a user to enter two numbers. The program then divides the first number by the second number and displays the results. However, if the second number is zero, the program displays an error message "Error, you cannot divide by zero" and the program terminates.

   i. Draw a program flowchart to represent the logic of the program. **[4 Marks]**

   ii. Write a C program for the flowchart in (i) above. **[4 Marks]**

# QUESTION THREE (20 MARKS)

a. Using relevant examples, explain the use of scanf() and gets() functions. **[4 Marks]**

b. Using well-labelled flowchart constructs, distinguish between **if** and **if .. else** statements as used in C programming. **[4 Marks]**

c. Describe any three functions of language translators. **[6 Marks]**

d. Write a program that prompts a user to enter 10 numbers and stores them in an array. The program should display the numbers in reverse order. **[6 Marks]**

## QUESTION FOUR (20 MARKS)

a. Discuss the rules of naming a variable in C. **[4 Marks]**

b. Compare and contrast local and global variables. **[4 Marks]**

c. Write a function named **bigsmall** that receives three integer arguments and returns the smallest and the largest of the three values. **[6 Marks]**

d. Write a program that demonstrates the function in (c) above by calling it and displaying the return values. **[6 Marks]**

## QUESTION FIVE (20 MARKS)

a. Explain any three reasons why a programmer would opt for top-down design when developing a program. **[6 Marks]**

b. Describe the term array as used in programming. **[2 Marks]**

c. Explain the importance of using arrays in programming **[2 Marks]**

d. The table below shows the criteria used by Bungoma County government to allocate bursaries to students. Write a C program that would prompt a user to enter the status of a student and return the amount allocated to the student. **[6 Marks]**

| Status | Amount Allocated |
|---|---|
| Orphan | 15,000 |
| Needy | 13,000 |
| Affirmative Action | 13,000 |
| Other | 0 |

e. The following C program was created by a first-year BIT student. Study the program and interpret it. **[4 Marks]**

```
int main ()
{
    int i, j;
    i=12;
    j=10;
    fn(i,j);
    printf("%d %d\n", i,j);
}
fn(int m, int n)
```

```
{
    m++;
    n++;
    printf("%d %d\n", m,n);
}
```