

CHUKA



UNIVERSITY

SUPPLEMENTARY/ SPECIAL EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF
BACHELOR OF SCIENCE IN APPLIED COMPUTER SCIENCE**

ACSC 122: INTRODUCTION TO STRUCTURAL PROGRAMMING

STREAMS: BSC (ACSC) YIS2

TIME: 2 HOURS

DAY/DATE:TUESDAY 02/02/2021

8.30 AM – 10.30 AM

INSTRUCTIONS:

Answer Question ONE and ANY other TWO Questions

Question One (30 Marks)

- a) Differentiate between variable and a constant as applied in C programming. (2 Marks)
- b) Write an algorithm that will compute the sum and average of **n** values and display the sum and average. (4marks)
- c) Outline the four types of errors found in Any programming language. (4 Marks)
- d) Discuss the two major types of programming languages; low level languages and high level languages giving examples. (4 marks)
- e) Discuss the structure of a Function in programming. (4marks)
- f) Explain the difference between testing and debugging in the context of programming. (4marks)
- a) write a C program that will accept inputs of marks for 4 units then compute the total and average and display whether the student has passed or failed, if the average is greater than or equal to 50 its pass otherwise its fail. (8 Marks)

QUESTION TWO (20 MARKS)

- b) Why is structured programming so enormous even today? (4marks)

- c) Write an algorithm which a given number *A* *increased* 100 *times* if *A* is less than 100, otherwise *A* is *decreased* by the 100. (4marks)
- d) Write a Program to accept the price of an item and calculate its VAT at 16% and discount at 5% the display discount given, VAT charged and total amount to be paid.(7 marks)
- e) write a Program to accept the length and width of a rectangle and calculate its area. (5 marks)

QUESTION THREE (20 MARKS)

- a) Define the term *array* as used in C programming. (2 marks)
- b) Outline the three constructs used in MODULAR programming. (3 marks)
- c) A traveler was traveling from America to Kenya and with him he has money in terms of dollars, on arrival to Kenya he wanted to convert the money into local currency. Write a program that will accept money in dollars and convert it to Kenya shillings. (5 Marks)
- d) For a person to be eligible to vote he/she must be 18 years and above, the government is registering voters who are 18years and above and have identification cards. Write a program to accept the age and the ID card then decide if the person is eligible to register. If eligible then display “register” otherwise display “not eligible to register” also display the age in both cases. (8 Marks)

Question Four (20 Marks)

- a) Differentiate between *do....while* and *while loop* control structure. (3 marks)
- b) Given the formula to calculate simple interest (I):

$$I = \frac{PRT}{100}$$
 Where P is principal interest, R is the rate of interest per annum (%p.a); T is the time in years. Write a C program to calculate the simple Interest (I). (5 marks)

- c) Study the following C extract program code and then answer the questions that follows:

```
#include <stdio.h>
int main()
{
  int age;
  scanf("%d",&age);
  age=age+1;
  age=(age+2) % 2
  printf("%d",age);
}
```

- i. Interpret the above program. (2 marks)
- ii. State the output if the input value is 12. (3 Marks)

- d) Write a C program that will accept the radius of a sphere and determine the volume. The program should then output the volume. *Use pie as 3.14. $volume=4/3\pi r^3$* (7 marks)

QUESTION Five (20 Marks)

- a) Study the following C program and then answer the questions that follow.

```
#include <stdio.h>
int main(

    intperi; //Perimeter of rectangle
    printf( 'Enter Length and width: ')
    scanf("%d%d%d", &length,&width;
    peri = 2(length+width;
    printf( "The perimeter is \n: ,perimeter );
    return 0
}
```

Identify **four errors** in the program.

(4 marks)

- b) Bididi Company intends to automate its staff records management system. The details of staffs to be captured include: *PersonalNumber*, *StaffName*, *Gender*, *IdentityNumber*, *JobTitle* and *Salary*. Assuming C programming language, State the most appropriate data type for each field. (3 Marks)

- c) Write a C program that will generate the following output.. Use **while** loop.

(6 Marks)

```
A
A  A
A  A  A
A  A  A  A
```

- d) Write a C program that will accept the *base* and *height* of a right angled triangle. The program then calculates and outputs the *area* depending on the users input using a user defined function. (7 marks)
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