

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATIONS**

**EXAMINATION FOR THE AWARD OF DEGREE OF  
BACHELOR OF SCIENCE IN MATHEMATICS, BACHELOR OF SCIENCE IN  
ACTUARIAL SCIENCE AND BACHELOR OF COMMERCE**

**COSC 104: INTRODUCTION TO COMPUTER PROGRAMMING METHODOLOGIES**

**STREAMS: BSC (MATHS) Y1S2, BSC (ACT SCI) Y1S2, BCOM Y2S2 TIME: 2 HOURS**

**DAY/DATE:**

**INSTRUCTIONS:**

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Answer **Question One** and any other two questions

**Question One (30 marks)**

- a) With an aid of an example state two types of comments applied in C programming. (3 marks)
- b) Define the following terms as applied in C programming: (3 Marks)
- i. local variable
  - ii. flow chart
  - iii. Identifier
- c) Explain two types of errors in a C program. (4 marks)
- d) The following are list of operators used in C programming:
- |    |    |
|----|----|
| !  | *= |
| == |    |
| <= | =  |
| *  | %  |
- Classify the operators as *Relational*, *Logical*, *Assignment* or *Arithmetic*. (4 marks)
- e) The following is a program that was written by a student in a C programming lesson.

*// A Program to Convert Temperature in Fahrenheit to Equivalent Degree Celsius*

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

    int ftemp; //for temperature in fahrenheit
    printf( "Enter temperature in fahrenheit: ")
    scanf( temp);
    int ctemp = (ftemp-32* 5 / 9);
    printf( "Equivalent in Celsius is:%f " ,ctemp '\n');
    return 0;
}
```

Identify at least **four** errors in the program. (4 marks)

- f) Write a C program that accepts the name of a student. The program then outputs the name and message "Welcome to C programming" in the screen. (4 Marks)
- g) The following identifiers were used by a student in C programming.
- i. switch
  - ii. StudentName
  - iii. Customer\_Number
  - iv. @each
  - v. Employee name

Identify the unacceptable identifiers giving reason in each case. (2 Marks)

- h) Convert  $104_{10}$  to base 3 using the division-remainder method. (4 marks)
- i) Differentiate between signed and unsigned numbers. (2 marks)

### Question Two (20 marks)

- a) Outline **four** advantages of object-oriented programming paradigm (4 Marks)
- b) Write a C program that will generate the following output. Use **while** loop. (6 Marks)
- ```
CCCCC
CCCCC
CCCCC
```
- c) Write a program that allows the user to capture the following numbers and store them an array. the program should then compute the total of all the numbers and output the total. (10 Marks)

8990  
567.9  
45.45  
2345  
6777

**Question Two (20 marks)**

- (a) Write a C program that would display the grades of students with A above 70, B above 60 C above 50 D above 40 and F below 40. **(10 marks)**
- (b) Write a C function that returns the velocity (V) given velocity is the change in the position of an object, divided by time. **(5 marks)**
- (c) Write a C program that calculates the area of a circle given the diameter is D and pie is a constant. **(5 marks)**

**Question Four (20 marks)**

- a) Draw a flowchart of a program that doubles a number. **(4 marks)**
- b) Using for loop control structure write a C program to output the following. **(6 marks)**

```

3      3      3
6      6      6
9      9      9
    
```

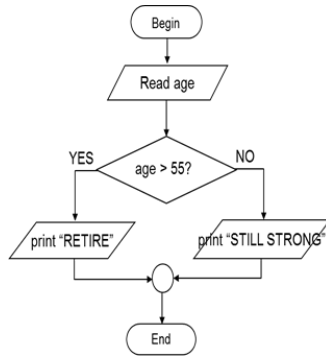
- c) The table below shows the days of the week and their corresponding messages. Use it to answer the question that follows.

| Day of the week | Message for the day          |
|-----------------|------------------------------|
| 1               | Hope you had a nice weekend  |
| 2               | Settle down for serious work |
| 3               | Its mid week                 |
| 4               | Ladies night                 |
| 5               | The weekend is back          |
| 6               | Rest today                   |
| 7               | Plan for week ahead          |

- Write a C program that will prompt a user to enter the day of the week. The program then outputs the appropriate message depending on the number entered. **(10 marks)**

**Question Five (20 marks)**

- a) Figure below shows a flow chart created by a certain student during a programming lesson. Use it to answer the question that follows. (5 Marks)



Write a C program that would implement the logic represented by the flow chart.

- b) Write a C program that sums all integers from 10 to 20. (5 marks)
- c) Table below shows the details of tax relief as determined by a certain tax firm. Use it to answer the question that follows.

| Category | Category name | Amount paid      | Tax relief on taxable income |
|----------|---------------|------------------|------------------------------|
| 1        | Casual        | At least 1000000 | 5%                           |
| 2        | Contract      | At least 2000000 | 10%                          |
| 3        | Termly        | At least 2000000 | 12%                          |
| 4        | Permanent     | At least 1000000 | 20%                          |
| 5        | Other         |                  | 0%                           |

The firm intends to computerize the process of determining the tax relief. Write a program that would be used by a programmer to meet the firms requirement.

(10 marks)

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