

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF  
COMMERCE, BACHELOR OF ENTREPRENEURSHIP, BACHELOR OF  
INFORMATION SCIENCE

COSC 104: INTRODUCTION TO COMPUTER PROGRAMMING

STREAMS: BCOM, BEEM, BSIS

TIME: 2 HOURS

DAY/DATE: MONDAY 10/12/2018

8.30 A.M. – 10.30 A.M.

CANDIDATE INSTRUCTIONS:

- Answer QUESTION ONE and any other TWO questions.
- Do not write on this question paper.
- Use either C or CH programming language.

Question One (Compulsory) [30 marks]

- (a) Define each of the following computer programming terms; (4 marks)
- Programming
  - Assembler
  - Interpreter
  - Compiler
- (b) Distinguish between the use of pseudo-codes and flowcharts as computer programming problem solving techniques (4 Marks)
- (c) Computer programming uses various data types to declare placeholders for different data items;
- Define the term *data type* (2 Marks)
  - Outline any four rules governing the declaration of variables in C++ (4 Marks)
  - Explain the two ways in which a constant variable can be declared in C++ (2 Marks)
  - Using any two of the above ways, define a constant variable called *PI* whose value is 3.142 (2 Marks)

(d) Consider the following program.

```
#include <iostream>
Using Namespace STD;
int main ()
(
    INT sum;
    /* COMPUTE RESULT
    sum = 25 + 37 - 19
    /* DISPLAY RESULTS //
    Cout<<"The answer is "<< suM<<endl);
    return 0
    }
```

i. Identify the syntactic errors in the following program (4 Marks)

ii. Rewrite the corrected program (3 Marks)

(e) Write a C++ program the gets the principal amount from the user, investment period in years and the interest rate. The program then computes and displays the simple interest ( $I = PTR/100$ ) and the total amount to be recouped after the investment (5 Marks)

### Question Two [20 marks]

(a) Using a flowchart design an algorithm for a program that takes a list of three integer values  $a$ ,  $b$  and  $c$ , and displays the largest of the three. (10 marks)

(b) Write a C++ program to implement your flowchart in (a) above (5 Marks)

(c) Explain the role of comments in a computer program. Using an example, explain the two types of comments in C++. (5 Marks)

### Question Three [20 marks]

(a) Using an appropriate example, explain the general structure of a C++ program (6 Marks)

(b) What would be the output of the following C++ code stub? (Show your workings) (6 Marks)

```
int num = 1;
int sum = 0;
while (sum <= 100 )
{
    sum = sum + num ;
    cout << "sum is: " << sum << endl;
    num = num * 2;
}
```

- (c) Write a C++ program that accepts an integer score value from the user. The program checks for valid scores and then displays the grade corresponding to the score using the grading table below. If the score is outside the acceptable range (less than 1 or greater than 100), the program displays *INVALID SCORE* (8 Marks)

<i>Score</i>	<i>Grade</i>
1 – 39	F
40 – 49	D
50 – 59	C
60 – 69	B
70 – 100	A

**Question Four [20 marks]**

- (a) Using appropriate illustration, explain any two looping structures used in computer programming (4 Marks)
- (b) Write a C++ program that outputs a pattern of numbers when given a user defined integer value, *n*. For instance, if *n* = 5, the following is displayed (6 marks)

```

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
    
```

- (c) Distinguish between each of the following pair of relational operators;

- i. ++ and + (2 Marks)
- ii. - and - (2 Marks)
- iii. == and = (2 Marks)

- (d) Outline any two bitwise operators used in C++ (4 Marks)

**Question Five [20 marks]**

- a. Define each of the following terms as used in programming (3 Marks)
- i. Function
  - ii. Function prototype
  - iii. Automatic local variable
- b. Using an illustration, explain the syntax of a C++ function (4 Marks)
- c.

- i. Write a C++ function that returns the maximum integer value when an array of ten integers is passed to it (7 Marks)
- ii. Write the main function that tests the above function when a user enters a set of 10 scores (6 Marks)

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