CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

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

ACSC 328: OBJECT ORIENTED PROGRAMMING (C++)

STREAMS: BSC (ACSC) Y3S2   **TIME: 2 HOURS**

DAY/DATE: FRIDAY 17/04/2020   **2.30 PM – 4.30 PM**

INSTRUCTIONS:

Question number 1 is compulsory. Answer any two questions from the rest.

SECTION A (30 MARKS)

QUESTION 1

a) Define the term *encapsulation* as used in OOP?   (2 marks)

b) Outline **two** ways in which comments can be implemented in C++ programs.   (2 marks)

c) Outline **four** advantages of Object-Oriented Programming.   (4 marks)

d) Differentiate between *derived class* and *base class* as used in OOP.   (4 marks)

e) Differentiate between a *constant* and a *variable*.   (4 marks)

f) The following expression is an extract from C++ program code.

    a. Number=Number/C

    b. B--

Identify other ways of writing the same expression in C++.   (2 marks)

g) Study the following C++ program segment and answer the questions that follow.

```
class stud
{
long int studdet;
int age;
```

```
char gender;
float weight;
public:
void studdata();
void studinfo();
void proc();
};
```

    a. Explain the significance of the keyword *void* in the program.   (2 marks)

    b. State **two** access specifiers used in the program segment.   (2 marks)

h) Differentiate between *do….while* and *while loop* control structure.   (4 marks)

i) Assuming C++ programming language, describe the general syntax for declaring a *multi dimensional* array.   (2 marks)

j) Explain the function of the *default* statement as used in a switch control structure in C++ programming language.   (2 marks)

SECTION B (40 MARKS)

Answer any two questions out of the three questions. All questions carry Equal marks.

QUESTION 2

a) Outline **four** components of a loop as used in C++ programs.   (4 marks)

b) Write a C++ program to implement a class named display. The class should contain a function member to output the following. Use a for loop structure.   (6 marks)

    3

    6   6

    9   9   9

c) Write a C++ program that will implement a class containing the dimensions of right-angled triangle (base and height) and a parameterized constructor to initialize the dimensions as 12 and 5 cm respectively. The program should then determine the length of the 3rd side through use of a function and output it.   (10 marks)

QUESTION 3

a) Explain each of the following terms as used in C++ programs: (4 marks)

    a. Global variable

    b. Pointers

b) Write a C++ program that will allow the user to enter a number and determines whether the number is a odd number. The program should then output the number and appropriate remark. (6 Marks)

c) Write a C++ program that will implement a nested class named display embedded in a class named nest with the following properties:

- A private data member named S;

- Public method named add used to determine the sum of 12,10 and 51;

- Methods named show used to display the sum of the three numbers. (10 marks)

QUESTION 4

a) Outline **four** benefits of inheritance as applicable in OOP. (4 marks)

b) Write a C++ program that will implement a class named sphere. The program should accept the radius and determine the volume. The program should then output the volume. *Use pie as 3.14.volume=4/3πr^3.* (6 marks)

c) Figure 1 shows an open cuboid. Write a C++ program that will implement two classes named Wall1 and Wall2 derived from a base class named pool. The base class contains the dimensions of two sides and a method used to set the values appropriately. The program should determine and output the surface area of the walls of the cuboid. Each derived class contains a method used to calculate the area for the two similar walls. (10 marks)
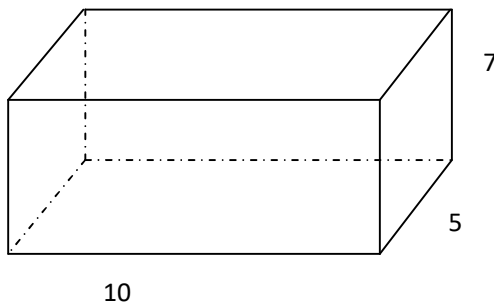

Figure 1

Question 5

a) Outline **four** advantages of arrays as used in OOP. (4 marks)

b) Write a C++ program that would count down from 100 to 0 in steps of 10.the program should then display the results vertically on the screen. Use **while** loop. (6 Marks)

c) A researcher had the following data obtained in an experiment

350.05
860.70
780.13
850.40
740.25

Write a C++ program that would prompt a user to enter this data for processing through the use of an array. Upon entry, the program then computes the average and outputs the result on the screen. Use a *while loop* .   (10 marks)