CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE

COSC 221: STRUCTURED PROGRAMMING

STREAMS: BSC COMP SCI   **TIME: 2 HOURS**

DAY/DATE: TUESDAY 5/12/2017   **11.30 A.M – 1.30 P.M**

INSTRUCTIONS:

- **Answer question ONE and any other TWO questions.**

- **Marks are awarded for clear and concise answers**

SECTION A

QUESTION ONE COMPULSORY (30 MARKS)

a) Describe the following terms.   (8 marks)
   - i)   Assembler
   - ii)   Debug
   - iii)   Compiler
   - iv)   Interpreter

b) Differentiate between a variable and a constant.   (4 marks)

c) Data types are core to programming languages. What do you understand by the term "Data-type"? Giving examples explain any four of the main data types supported in C.

            (4 marks)

d) Write a program a C program that converts temperature from degrees Celsius to Farenheight. Where Farenheight=32+9/5*Celcius. The program should be presented on the screen in the following format: 15 degrees Celcius is equal to 93.2 degrees Celcius.

(6 marks)

e) Differentiate between IF and switch statements used in C programming. (4 marks)

f) Briefly explain the purpose of the following statements used in C. (4 marks)
   i) #include <stdio.h>
   ii) main()

SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS).

QUESTION TWO (20 MARKS)

a) Differentiate between the following as used in C programming:
   ii) || and && operators
   iii) = and = = operators

(6 marks)

b) Write a C program to input student name, Maths, English, Kiswahili marks of 6 students calculating the total and average marks of each student and displaying each student grade as shown below. (6 marks)

Marks	Grade
Above 80	A
Between 60 and 80	B
Between 40 and 60	C
Below 40	D

c) Briefly describe the purpose of the following as used in programming. (4 marks)
   i) Editor
   ii) Linker

d) Write a C program to input dimension of a cylinder then calculate volume of the cylinder. Where volume = $\pi r^2 h$. (4 marks)

QUESTION THREE (20 MARKS)

a) Differentiate between syntax and logical errors stating how they can de detected.

(4 marks)

b) Briefly explain the following approaches used in programming. (4 marks)
   i)   Top-down
   ii)   Bottom-up

c) Write a C program to input 3 numbers and display the biggest and the smallest number among the three numbers entered. (6 marks)

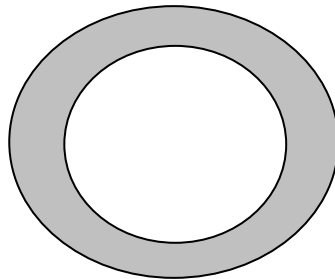d) The following is a C program segment. Use it to answer the questions that follows:
   Num =10;
   n=-1;
   While n<8 do
   {
   Num=num+n;
   n=n+1;
   }

Trace the values of n and num from num=10 and n=-1 to the last value when n=7. (6 marks)

QUESTION FOUR (20 MARKS)

a) i) Design a flowchart to calculate area of the shaded part shown below (3 marks)

   ii) Write a C program to solve the above problem. (3 marks)

b) Differentiate between an identifier and a keyword used in C programming and 2 examples in each case. (4 marks)

c) Write a C program that accepts two numbers and operator (+,-,/,*) computes the result depending on the operator entered, and then output the numbers, operator and the result. (6 marks)

d) Outline the function of the following C format specifier. (4 marks)
   i)   %c
   ii) %f
   iii) %s
   iv) %d

QUESTION FIVE (20 MARKS)

a) A company requires a program to enter employee name, hours worked and rate per hour of an employee then calculate basic pay= hours worked multiplied with rate per hour. Tax is calculated on basic pay as follows:

Basic pay	Tax
Over 50000	20% of basic pay
Between 20000 and 50000	10% of basic pay
Below 20000	No discount

Design a C program that will enable the user to enter the above details and calculate basic pay, tax and net pay = basic pay – tax. (6 marks)

b) Write a C program that reads the radius of a sphere and calculate the volume. Where volume $=4/3 \ \Pi r^3$. (6 marks)

c) Give four rules applied when naming an identifier. (4 marks)

d) Describe 2 purpose of a compiler. (4 marks)