CHUKA   **UNIVERSITY**

FIRST YEAR SEMETER TWO EXAMINATION FOR THE AWARD OF BACHELOR OF SCIENCE MATHS/ CHEMISTRY/ PHYSICS/ INDUSTRIAL CHEMISTRY/ ACTUARIAL SCIENCE

COSC 104: INTRODUCTION TO COMPUTER PROGRAMMING METHODOLOGIES

STREAMS: B.SC MATHS/CHEM/PHYS/ INDUSTRIAL CHEM/ ACTUARIAL SCI (Y1S2)   **TIME: 2 HOURS**

DAY/DATE: TUESDAY 16/4/2019   **2.30 P.M. – 4.30 P.M.**

INSTRUCTIONS:
- **Answer question ONE and any other TWO**
- **Do not write on the question paper**

SECTION A: Answer all questions in this section

QUESTION ONE (30 MARKS)

a) Distinguish between **Selection** and **Iteration** control structures.   **[4 marks]**
b) Using a control structure of your choice:
   i)   Write a program that prints all the **ODD** numbers less than 10 in reverse order.   **[6 marks]**
   ii) Draw a flowchart for your program in i) above.   **[4 marks]**
c) Describe **TWO** ways by which string input can be read to a variable in C. **[4 marks]**
d) Outline any 4 rules in naming identifiers.   **[4 marks]**
e) Write a program that accepts two numbers. The program then displays the Sum, Product, Quotient and Remainder (Modulus) separated by tabs.   **[6 marks]**
f) Giving examples define escape sequences in C.   **[2 marks]**

SECTION B: ATTEMPT ANY TWO QUESTIONS (40 MARKS)

QUESTION TWO (20 MARKS)

a) Highlight the aspects of a function in relation to the C programming language giving the syntax for each aspect in C.   **[6 marks]**
b) Differentiate between interpreters and compilers.   **[4 marks]**

c) Write a program that stores the first 20 prime numbers into an array. **[6 marks]**
d) Write the algorithm for the program in c) above. **[4 marks]**

QUESTION THREE (20 MARKS)

a) Define what a data type is and define any **TWO** primitive data types used in most programming languages. (Use a programming language of your choice). **[4 marks]**

b) Explain Polymorphism, Abstraction and Inheritance as used in object oriented programming. **[6 marks]**

c) Discuss the difference between the **Do-While** and **While** loop controls and write an example program that implements either. **[6 marks]**

d) Draw a flowchart that explains the **if…else** selection construct. **[4 marks]**

QUESTION FOUR (20 MARKS)

a) Outline the features of high-level programming languages. **[4 marks]**
b) Differentiate between Source code and Object Code in compiled programs.**[4 marks]**
c) Suppose a set of integer values are stored in an array:
   i) Write a function to determine the largest value in the array. **[4 marks]**
   ii) Write a pseudocode for your program in i) above. **[4 marks]**
d) Outline the properties of an effective algorithm. **[4 marks]**

QUESTION FIVE (20 MARKS)

a) Outline the merits of dividing large programs into functions. **[4 marks]**
b) Outline the generic steps in any software development process**. [5 marks]**
c) A computer repair shop charges KSh. 100 per hour for labour plus the cost of any parts used in the repair. The minimum charge for any job is however Ksh. 150.
   i) Write a program that prompts for the number of hours worked and the cost of parts and displays the charge for the job. Use symbolic constants. **[6 marks]**
   ii) Draw a flowchart for your program in i) above. **[5 marks]**