Kasarani Campus
Off Thika Road
P. O. Box 49274, 00101
NAIROBI
Westlands Campus
Pamstech House
Woodvale Grove
Tel. 4442212
Fax: 4444175

KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATIONS, 2024/2025 ACADEMIC YEAR
FIRST YEAR, FIRST SEMESTER EXAMINATION
FOR THE DEGREE OF BACHELOR OF SCIENCE (MATHEMATICS)
KCS 2101: INTRODUCTION TO PROGRAMMING

DATE: 13TH DECEMBER, 2024
TIME: 2:30PM-4:30PM

INSTRUCTIONS TO CANDIDATES
ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS
QUESTION ONE: COMPULSORY (30 MARKS)

a) State four features of C programming language. **(4 Marks)**

b) Distinguish between the following terms used in structured programming.

    i. Preprocessor directives and Header files. **(2 Marks)**

    ii. Compiler and Interpreter. **(2 Marks)**

    iii. Predefined functions and user defined functions. **(2 Marks)**

c) Using a program code sample, explain the different components in a C program **(6 Marks)**

d) The table below represents litres of milk a farmer sells each day.

Day	Litres
1	34
2	50
3	45
4	40

As a programmer, write a program in C that captures the above data using a while loop and calculates the average litres sold by the farmer for the four days. **(6 Marks)**

e) A program code error can be either be syntax, logic or runtime error. class the errors below.

    i. An infinite loop. **(2 Marks)**

    ii. Misspelling keyword. **(2 Marks)**

f) With respect to function parameter passing, what is the difference between call-by-value and call-by-reference. **(4 Marks)**

QUESTION TWO: (20 MARKS)

a) C language contains reserved words. Briefly describe your understanding of reserved words **(2 Marks)**

b) Identify any 8 reserved words in C **(4 Marks)**

c) Identify any four identifier naming rules in C **(4 Marks)**

d) State and explain any four-escape sequence or special characters in C. **(4 Marks)**

e)   The following program demonstrates how conditional operator works, explain the program and show the output obtained after executing the program.   **(6 Marks)**

QUESTIONS THREE: (20 MARKS)

a)   You are an IT technician in a health clinic. You have been asked to write a sample C program that would help the doctor capture some data about a patient. Ensure your program captures data pertaining to: patient's name, age, eye color, weight, skin color and hair color.   **(10 Marks)**

b)   Design an algorithm with a natural number, n, as its input which calculates the following formula and writes the result in the standard output. Write an error free program to implement the above algorithm.

(10 Marks)

$$S = \frac{1}{2} + \frac{1}{4} + \frac{1}{6} + \cdots + \frac{1}{n}$$

QUESTION FOUR: (20 MARKS)

a)   Explain the following operators used in C programming language.

    i.   Relational operators.   **(2 Marks)**

    ii.   Assignment operators.   **(2 Marks)**

    iii. Conditional operators.   **(2 Marks)**

    iv.   Unary operators.   **(2 Marks)**

b)   Write a C program to prompt a user to enter an integer n. The program checks if the integer is even and displays it on standard output screen. If not an even it requests the user to enter another integer and repeats the process.   **(8 Marks)**

c)   The printf() and scanf() functions are defined in the standard input output library. What is the role of the printf() and scanf() function in c program.   **(4 Marks)**

QUESTION FIVE: (20 MARKS)

a)   A user is prompted to enter an integer n, the program checks if the integer is positive or negative, if it is negative, it prompts the user to enter another integer, else if the integer is positive, the program calculates the square of the number and displays the number and the square as output.

i)   Draw a flowchart to demonstrate the flow of the above problem.   **(6 Marks)**

ii)   Write an algorithm to show how the above program works.   **(6 Marks)**

iii)   Write a c program to implement the above algorithm.   **(4 Marks)**

b)   Explain the difference between global declaration and local declaration in C programming language.

(4 Marks)