JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF ACTUARIAL SCIENCE

1st YEAR 2ND SEMESTER

2023/2024 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: ITB 9105

COURSE TITLE: PROGRAMMING in C

DATE: **TIME:**

TIME: 2   HOURS

Instructions:

1. **Answer QUESTION ONE (Compulsory) and any other two questions**
2. **Tick the most correct alternative in Section A.**
3. **Candidates are advised not to write on the question paper.**
4. **Candidates MUST hand in their answer booklets to the invigilator while in the examination room.**
5. **Mobile phones are NOT allowed in the examination room.**

QUESTION ONE (COMPULSORY)   30 MARKS

a) Distinguish between top down design model and bottom up design model as applied in problem solving process.   **(5 MARKS)**

b) Explain the distinction between the following categories of programming languages **(6 Marks)**

1. High Level
2. Assembly
3. Machine

c) Using examples, define the following concepts in programming; **(8 marks)**

i. Variable
ii. Identifier
iii. Keyword
iv. Pseudocode

d) Explain the steps a computer program should go through   **(5 Marks)**

e) Describe the structure of a c program   **(6 Marks)**

QUESTION TWO   (20 MARKS)

a) Explain any four advantages of modular/ structured programming. (10 marks)

b) Explain basic data types used in programming. (10 marks)

QUESTION THREE   (20 MARKS)

a) Distinguish between the following terms Compilers and Interpreters. (5 marks)

b) Explain the syntax of a nested if statement. (5 marks)

c) Describe the structure of a c program. (5 marks)

d) Describe the purpose of the "if-else" statement in C with a simple example. (5 marks)

QUESTION FOUR   (20 MARKS)

a) Draw a flowchart for the following problem: A student wants to determine whether the values stored in A and B are not equal. Then will store the bigger value in the space labeled LARGE and the smaller value in location labeled SMALL. Finally prints the bigger value i.e. either A or B accordingly. (10 marks)

b) Write a C program that swaps the values of two variables without using a temporary variable. (10 marks)

QUESTION FIVE   (20 MARKS)

a) Explain the role of pointers in C programming. Provide an example to illustrate their usage. (10 marks)

b) Write a C program to find the factorial of a given number using a recursive function. (10 marks)