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

2024/2025 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: ITB 9105

COURSE TITLE: PROGRAMMING in C

DATE: 23/4/2025 **SESSION: 9.00-11.00**

TIME: 2 HOURS

Instructions:

1. Answer Section A and any other TWO Sections
2. Candidates are advised not to write on the question paper.
3. Candidates MUST hand in their answer booklets to the invigilator while in the examination room.
4. Mobile phones are NOT allowed in the examination room.

SECTION A: 30 Marks

1. What is a variable in C? (1 mark)
2. Name any two data types in C. (1 mark)
3. What is the difference between printf() and scanf()? (2 marks)
4. What is the purpose of the return statement in a function? (2 marks)
5. Identify the output of the following code:

```
int x = 10;
printf("%d", x++);
```

6. What is an array? Provide an example declaration. (2 marks)
7. Name any two looping constructs in C. (2 marks)
8. What does the sizeof operator do? (2 marks)
9. What is the use of #include<stdio.h> in C? (2 marks)
10. How does an if statement work? Provide an example. (2 mark)
11. Explain the difference between = and == in C. (2 marks)
12. What is meant by a function prototype in C? (2 marks)
13. Define recursion with an example. (2 marks)
14. What is the difference between while and do-while loops? (2 marks)
15. What is a pointer in C? (2 marks)

SECTION B: 20 Marks

1. Explain any five advantages of modular/ structured programming. (5 marks)
2. Explain basic data types used in programming. (5 marks)
3. Explain the syntax of a nested if statement. (5 marks)
4. Differentiate between while loop and do while Loop using syntax and block diagrams. (5 marks)

SECTION C: 20 Marks

1. Describe the structure of a c program. (5 marks)
2. Distinguish between the following terms Compilers and Interpreters. . (5 marks)
3. Explain how a for loop works with an example program. (5 marks)
4. Write a Pseudo code of a simple program that accepts two integers, compares them and display the relationship between them i.e. whether they are the same or one is greater than the other. **(5 Marks)**

SECTION D: 20 Marks

1. Distinguish between top down design model and bottom up design model as applied in problem solving process. **(6 Marks)**

2. Using examples, define the following concepts in programming; **(8 marks)**
   i. Variable
   ii. Identifier
   iii. Keyword
   iv. Pseudocode
3. Explain the distinction between the following categories of programming languages **(6 Marks)**

   i. High Level
   ii. Assembly
   iii. Machine

SECTION E: 20 Marks

1. 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)**

2. Write brief notes on each of the steps below used to solve a problem on a computer **(10 MARKS)**
   i. Defining the problem and analyzing the problem:
   ii. Developing the algorithms
   iii. Writing a computer program corresponding to the algorithm
   iv. Testing and debugging the program
   v. Documenting the program