(Please write your Exam Roll No.) Exam Roll No. .....

END TERM EXAMINATION

FIRST SEMESTER [B.Tech] DEC 2025-JAN 2026

Paper Code: IT-101 **Subject: Programming for Problem Solving**

Time: 3 Hours **Maximum Marks: 60**

Note: Attempt all questions as directed. Internal choice is indicated.

Q1 Attempt **any Five** of the following questions: **(5x4=20)**

(a) What are preprocessor directives? Explain different categories.
(b) What is a token? What are the different types of tokens available in C?
(c) What are actual parameters and formal parameters? Illustrate with example.
(d) What is an array? How are single-dimensional and two-dimensional arrays declared and initialized?
(e) Show how break and continue statements are used in a C program with example.
(f) Explain the syntax and working of the if, if–else and nested if statements.
(g) Write a C program to find the factorial of a number using recursion.
(h) Write a C program for bubble sort. Also Explain bubble sort with a step-by-step example.

Q2 Attempt all the questions given below: **(5x2=10)**

(a) Define pseudocode. Write pseudocode to find the area of a triangle using the lengths of all three sides.
(b) Write a program to find the largest of three numbers using conditional operator.

OR

Q3 Attempt all the questions given below: **(5x2=10)**

(a) Explain the basic structure of a C program with example. Draw a flowchart to find the largest of three numbers.
(b) Explain keywords, identifiers and constants with examples. Write a program to accept integer and float values and print their sum and average.

Q4 Attempt all the questions given below: **(5x2=10)**

(a) Explain the switch statement with rules and examples. Write a program to implement a menu-driven calculator using switch statement.
(b) Explain call by value and call by reference. Write a program to swap two numbers using call by reference.

OR

Q5 Attempt all the questions given below: **(5x2=10)**

(a) What is a string in C? How are strings stored? Explain string input/output functions (gets(), puts(), fgets(), printf()).
(b) Write a program to count vowels, consonants, digits, and spaces in a string.

Q6 Attempt all the questions given below: **(5x2=10)**

(a) Explain dynamic memory allocation and related functions (malloc, calloc, realloc, free).
(b) What is pointer to pointer? Write a program to demonstrate pointer to pointer concept.

OR

Q7 Attempt all the questions given below: **(5x2=10)**

(a) Define a structure. Explain structure declaration and initialization. Write a C program to store and display details of N students using structures.
(b) Explain file handling in C. Write a program to count number of characters, words and lines in a file.

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Q8 Attempt all the questions given below: **(5x2=10)**

(a) Explain binary search. State its requirement. Write a C program to implement binary search.

(b) Explain selection sort with example. Write a C program for selection sort.

OR

Q9 Attempt all the questions given below: **(5x2=10)**

(a) Define stack and its operations. Explain stack overflow and underflow. Write a C program to implement stack using array.

(b) Explain singly linked list structure. Write a C program to insert and delete nodes in singly linked list.

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