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

END TERM EXAMINATION

FIRST SEMESTER [B.TECH] DECEMBER 2025-JANUARY 2026

Paper Code: ES-101 **Subject: Programming in 'C'**

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

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

Q1 Attempt any five of the following questions: (4x5=20)

a) Write a C program to find the factorial of a number entered by the user.

b) What will be the value of j at the end of the execution of the following C program?

```
int incr (int i)
{
        static int count = 0;
        count = count + i;
        return (count);
}
main ( )
{
        int i, j;
        for (i = 0; i <= 4; i++)
                j = incr (i);
}
```

c) What is the difference between direct and indirect recursion?

d) Elaborate on the difference between while and do-while loop control structures with the help of a C program.

e) Explain the difference between sequential and random-access files.

f) Discuss the scope, visibility and lifetime of a variable.

Q2 a) Explain different types of tokens. Discuss keywords, identifiers, constants, and special characters in detail with examples. (5)

b) Discuss auto, extern, static and register storage classes with the help of a C program. (5)

OR

Q3 a) Explain arithmetic, relational, logical, bitwise, assignment and comma operators in detail with examples. (5)

b) Write a C program to elaborate difference between call by value and reference.(5)

Q4 a) What is the difference between function with argument and without argument? Write a C program to elaborate on function definition, prototype and call. (5)

b) Discuss different types of control structures. Elaborate on the statements to achieve sequence, selection, and loop in the control structure. Explain jump statements. (5)

OR

Q5 a) What are multi-dimensional arrays? How are multi-dimensional arrays different from 2D arrays? Write a C program to initialize and print values using a 2D array. (5)

P.T.O.

b) How string can be declared and initialized? Discuss string handling functions strlen(), strrev(), strcat(), strcpy(), strspn() and strpbrk() with example. (5)

Q6 a) Write a C program to access variables using a Pointer. Explain the significance of * & operator. How to declare and initialize a pointer? (5)

b) Differentiate text and binary files. Explain file positioning random access functions. (5)

OR

Q7 a) What are self-referential structures? Write a C program to elaborate on the difference between union and structure. (5)

b) What is the need for file handling? Explain file access modes for text files: r, w, a, r+, w+, a+ and binary files: rb, wb, ab, r+b, w+b, a+b. (5)

Q8 a) Differentiate linear search from binary search. Search item 37 from the following sorted data elements using binary search. (5)

1, 4, 9, 13, 15, 21, 37, 55, 71, 92

b) What is selection sort? Write a C program to implement the selection sort algorithm. (5)

OR

Q9 a) What is bubble sort? Sort the following numbers using bubble sort. (5)

32, 51, 27, 85, 66, 23, 13, 57

b) Explain standard library functions of the header file: math.h, time.h, ctype.h, string.h, stdio.h and stdlib.h in detail. (5)

****