R22 Regulation *Subject code: 4B1AM*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech I Semester Regular/Supplementary Examinations, January 2024

PROBLEM SOLVING USING C PROGRAMMING

(Information Technology)

Maximum Marks: 60 Date:24.01.2024 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x1M=10 Marks)			CO No.	Bloom Tx
1.	a	Write three problem-solving techniques discussed for developing programs?	1	1
	b	Define a variable in the context of C programming.	1	1
	c	Choose one type of storage class and write its purpose.	2	1
	d	What is the purpose of iteration statements in C.	2	1
	e	Differentiate between call by value and call by reference parameter passing methods in C functions.	3	1
	f	How do you declare and initialize a string in C programming?	3	1
	g	Define pointer.	4	1
	h	What is the purpose of the typedef keyword in C programming when used with structures?	4	1
	i	What is the purpose of conditional compilation in C programming using preprocessor directives.	5	1
	j	Write fopen function in file operations in C?	5	1

Part-B

Answer All the following questions. (5X10M=50Marks)				
2		Design an algorithm, write a corresponding pseudo code, and create a flow chart for a program that calculates the average of a set of numbers entered by the user. Explain how each step in the development process contributes to the overall effectiveness of the program. 10M	1	2
		OR		
3		Differentiate between an operator, operand, and expression in the context of C programming. Provide clear definitions for each term and illustrate their relationship in a simple code snippet. Explain why understanding these concepts is fundamental to programming. Additionally, elaborate on each type of expression with an example program to showcase their importance and practical application. 10M	1	2

4	What is the difference between entry-controlled loops and exit-controlled loops? Explain with syntax and with the help of a flowchart. Calculate the sum of the first five natural numbers using all three loops (for, while, and do-while). Explain which loop is best for this scenario and why. 10M	2	2
	OR		
5	a) Consider the elements 11,22,32,25,18,9,34. Sort these numbers according to the selection sort. Explain the entire process iteration-wise. 5M b) Design a solution to print the transpose of a given matrix. 5M	2	3
6	Explain the concept of call by value and call by reference with an example. 10M	3	3
	OR		
7	a) Define string in C. Explain how to initialize the strings in different ways. 5M b) Define and differentiate string handling functions in C. 5M	3	2
8	Develop a C program that uses a pointer to a structure. Illustrate how the pointer facilitates efficient manipulation and access to the structure's members. Discuss the advantages of using pointers with structures. 10M	4	3
	OR		
9	Implement a C program that utilizes a union for memory optimization. Perform operations on the union and explain how unions can be advantageous in certain programming scenarios. Discuss the trade-offs between unions and structures. 10M	4	3
10	Discuss the significance of command line arguments in C programs. What role do they play in enhancing the flexibility and functionality of a program? Provide examples to illustrate the use of command line arguments. 10M	5	3
	OR		
11	Design a C program that performs file operations, including opening, reading, and writing to a file. Implement error handling mechanisms to manage file-related issues. Explain how these operations contribute to data persistence in C programming. 10M	5	3