Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–I & II EXAMINATION – WINTER 2024

Subject Code:3110003 Date:07-01-2025

Subject Name:Programming for Problem Solving

Time:10:30 AM TO 01:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	What is Software? List various types of Software.	**03**
	(b)	Define following terms: 1. Compiler 2. Runtime Error 3. Dynamic Memory Allocation 4. Recursion	**04**
	(c)	Write an algorithm and draw the flowchart to calculate sum of digits of a given number N.	**07**
Q.2	**(a)**	Explain the basic structure of a C program with an example.	**03**
	(b)	Evaluate given C programming Expressions : 1. Ans = 10 + 4 * 3 / 2; 2. Ans = while(1); 3. Ans = 3 * 2 > 3 + 1; 4. Ans = (2 + 4) > 3 && 2 < 4;	**04**
	(c)	Write a C program to print the following pattern as output: A B C D E F G H I J	**07**
		OR	
	(c)	Write a C program that takes three coefficients (a, b and c) of a quadratic equation ; ($a.x^2 + b.x + c$) as input and compute all possible roots and print them with appropriate messages.	**07**
Q.3	**(a)**	Differentiate while loop and do..while loop with example.	**03**
	(b)	What is type conversion? Explain two types of conversion with examples.	**04**
	(c)	Write a C program which takes marks (between 0 to 100) of a student for N subjects. It should print grade of a student based on Percentage of Student's marks . "A" for >=85%, "B" between >=70% and <85%, "C" between >=50% and <70%, "PASS" between >=35% and <50%, "FAIL", if any one subject marks are <35.	**07**

OR

Q.3	**(a)**	What is function? How Call by value and Call by reference passes the argument in function.	**03**
	(b)	What are the steps in writing a recursive function in a program?	**04**
	(c)	Write a program in C to calculate the power of any number using recursion.	**07**
Q.4	**(a)**	What is string ? How to declare string in C?	**03**
	(b)	Explain significance of following string functions with example. 1. strcat() 2. strlen() 3. strcpy() 4. strcmp()	**04**
	(c)	Write a C program ,that reads a statement from user and prints the frequency of each of the distinct character from a-z.	**07**

OR

Q.4	**(a)**	Compare Array, Structure and Union.	**03**
	(b)	Define Union. Describe how to declare, initialize and access members of Union with a programming example.	**04**
	(c)	Write a C program which takes two NxN matrices and performs matrix multiplication.	**07**
Q.5	**(a)**	What is a pointer? What are the advantages of using pointer?	**03**
	(b)	Explain need of Dynamic Memory allocation. Compare malloc(), calloc() and realloc() functions.	**04**
	(c)	Write a C program to find the sum and mean of all elements in an array using pointer.	**07**

OR

Q.5	**(a)**	What is File Pointer? What is significance of File Pointer?	**03**
	(b)	Explain signification of following functions in file operations. 1. fseek() 2. ftell() 3. open() 4. fread()	**04**
	(c)	Write a C program to read ID and marks of n number of students from user and store them in a file.	**07**

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