Name of Course: B.Tech
Name of Paper: Programming for Problem Solving
Time: 3 Hour's

Semester: II
Paper Code: TCS 201
Maximum Marks: 100

Note:
- All questions are compulsory.
- Answer any two sub questions among a, b and c in each main question.
- Total marks in each main question are twenty.

Q1		**10x2=20 Marks**
		CO1
a.	What is String? How is it different from an array? Write any five inbuilt strings functions with an example.	
b.	Write a C program to accept records of employees. The structure should include employee name, age, and basic salary. Calculate total salary as the sum of basic salary, hra and da. da= 10% of basic salary hra=5% of basic salary. Display age, total salary of employee in descending order based on total salary. Create separate function for input and output.	
c.	Define the following terms with an example for each: 1. Dangling pointers 2. Null pointer 3. Wild pointer 4. Segmentation Fault	

Q2		**10x2=20 Marks**
		CO2
a.	What is dereferencing of pointer variable? Difference between ++*p, *p++ and *++p in C using an example.	
b.	Differentiate between call by value and call by reference parameter passing methods with an example.	
c.	Implement a C program to read an entire string in lowercase or uppercase from the keyboard then replace the character at the middle of the string by the character 'X'. If the string read is of even length, then ignore it. Display the modified string to the screen. Implement without using any in-built function. For Ex **Sample Input:** PROGRAMMING **Sample Output:** PROGRXMMING **Sample Input:** merchandise **Sample Output:** merchXndise	

Q3		**10x2=20 Marks**
		CO3
a.	Define Dynamic memory allocation feature available in C? When does a memory leak problem arise? Briefly explain their functionality with their parameters: 1. malloc 2. calloc 3. realloc 4. free	
b.	Write a short note on any two with an example in each: a. Self-referential structure b. Structure and union. c. c. Memory leak	

	c.	Write a Python script to read a string from the user and display it by capitalizing the alternate letter present in it to the console: Sample Input: "mountaineering" Sample Output: "MoUnTaInEeRiNg"	10x2=20 Marks	
Q4				CO4
	a.	Write a program in C to remove all whitespaces in a String and print it on the screen. For example given the following string as input: "Keep Learning Dear Students" and the program should generate: "KeepLearningDearStudents" as output		
	b.	Write a program in python to capitalize the first and last character of each word in a string. Input: welcome to graphic era hill university Output: WelcomE TO GraphiC ErA HilL UniversitY		
	c.	Write a Python program that reads the content of a text file named 'Input.txt' and performs text transformation operations based on user input. The supported operations include converting the entire content to uppercase, lowercase, or capitalizing the first letter of each word. Additionally, ensure that the program is user-friendly and provides clear instructions and prompts to the user.	10x2=20 Marks	
Q5				CO5
	a.	Write a python program to replace space with a given character. Example : A user has provided the string "D t C mpBl ckFrld ys le" and the character "a", and the output will be "DataCampBlackFridaySale"		
	b.	Write a Python program that prompts the user to input a specific character or word to search for. The program should then search for the given context within the text and return the number of occurrences found to the console.		
	c.	Write a C program that extracts the tokens from the string. Given a string as input, the program should print on the screen each token on a new line. For example, given the following string as Input: "Hello how are you friends." the program should generate: Hello how are You friends		