K. J. Somaiya School of Engineering, Mumbai-77
(Somaiya Vidyavihar University)

Course:	Programming in C			**Semester:**	II	**Date:**	
Division:		**Batch:**		**SET**	F	**Name:**	
Exam:	OST			**Time:**		**Roll No:**	

Q 1	Attempt Any ONE [Show all test Cases in output.]	Marks
1	Write a C program that generates a prime number pyramid based on user input. The user inputs the number of rows (R). **Test Case 1:** Enter number of rows: 5 2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 **Test Case 2:** Enter number of rows: 3 2 3 5 7 11 13 **Input from user 1 marks** **check if a number is prime 3 marks** **generate the prime number pyramid 3 marks** **Output and check all test cases 1 marks**	08
2	Write a C program that implements a **multi-factor authentication system** with the following security features: 1. The user must **enter a correct password** within **3 attempts**. 2. If the password is incorrect, allow the user to reattempt. 3. If the password is correct, the user must **answer a security question correctly** to gain access. 4. If all 3 attempts fail, print **"Too many failed attempts. Access Denied!"** 5. Use **#define** to set: ○ **Password** ○ **Security answer** ○ **Maximum allowed attempts** **Test Case 1:** Secure Login System Enter password: ramsita Password Correct! Security Question: What is your favorite color? Answer: Blue Access Granted! **Test Case 3:** Secure Login System Enter password: RAMSITA Incorrect password. Attempts left: 2 Enter password: RamSita Incorrect password. Attempts left: 1 Enter password: Ramsita Too many failed attempts. Access Denied!	08

	Input from user & use of #define 2 marks **Password & security question authentication 3 marks** **Logic of attempts 2 marks** **Output for all test cases 1 marks**	

Q 2	Attempt Any ONE [Show all test Cases in output.]	Marks
1	Write a C program to manage multiple date representations using a structure and a union. The program should: ● Store and display a date using a structure containing: day, month, and year as integers. ● Use a union to store either: ○ A timestamp (integer representation as YYYYMMDD). ○ A formatted date (string representation, e.g., "DD-MM-YYYY"). ● Functionalities to be implemented: ○ Input a date from the user. ○ Convert and store the date either as a timestamp or as a formatted string. ○ Display the date in both formats. ○ Compare two dates and determine which is earlier or later. **Test Case 1:** Enter date (DD MM YYYY): 10 03 2024 Choose storage format (1 for Timestamp, 2 for Formatted String): 2 Date stored as formatted string: 10-03-2024 Enter first date (DD MM YYYY): 01 01 2023 Enter second date (DD MM YYYY): 05 06 2023 The first date is earlier. **Test Case 2:** Enter date (DD MM YYYY): 10 03 2024 Choose storage format (1 for Integer, 2 for Formatted String): 1 Date stored as integer: 20240310 Enter first date (DD MM YYYY): 10 10 2023 Enter second date (DD MM YYYY): 05 06 2022 The second date is earlier. **Define structure for date and union to store 3 marks** **Function to input 2 marks** **Function to convert and store 2 marks** **Function to compare 3 marks** **Function to display 2 marks**	12
2	Develop a **C program** using pointers and functions to perform geometric computations on a **square**. Your program should: 1. **Compute the distance** between two points (x1,y1) and (x2,y2) using a function that takes pointers as arguments. 2. **Compute the area** of a square given its four vertices (x1,y1), (x2,y2), (x3,y3), and (x4,y4) using the distance function. 3. **Determine if a given point** (x,y) lies inside the square by checking coordinate constraints. Imaplent below functions: ***distance() , area(), inside()***	12

Test Case 1:	**Test Case 2:**
Enter coordinates of A (x1 y1): 0 0 Enter coordinates of B (x2 y2): 4 0 Enter coordinates of C (x3 y3): 4 4 Enter coordinates of D (x4 y4): 0 4 Enter point (x y) to check: 2 2 Square Side Length: 4.00 Square Area: 16.00 Point (2,2) lies inside the square.	Enter coordinates of A (x1 y1): 1 1 Enter coordinates of B (x2 y2): 5 1 Enter coordinates of C (x3 y3): 5 5 Enter coordinates of D (x4 y4): 1 5 Enter point (x y) to check: 6 2 Square Side Length: 4.00 Square Area: 16.00 Point (6,2) lies outside the square.

accept points 2 marks
Distance function using pointers 2 marks
Area function using pointers 3 marks
Inside function using pointer 3 marks
Display results for all test cases 2 marks