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General Instructions: Write Program in C++ to solve the following problems with and without one or more user defined functions where appropriate.

Problem No.	SL No.	Description	Page No.
P-1	1. a)	Solve suppressed cubic equations or transcendental functions by using bisection & Newton-Raphson method.	
P-2	1. b)	Solve cubic general cubic equation by using determinant approach.	
P-3	2.0	Calculate the value of $\sin x$, $\cos x$ and $\log(1+x)$ using its series for some given x using WHILE or DO WHILE condition.	
P-4	3. a)	Program to check whether any given number is prime or not. Write codes for both with and without user defined function.	
P-5	3. b)	Program to find the factorial of any given number. Write codes for both with and without user defined function.	
P-6	3. c)	Program to sort an array of numbers in ascending and descending order. Write codes for both with and without user defined function.	
P-7	3. d)	Program to find the largest and smallest number that can be formed using digits of a given number. Write codes for both with and without user defined function.	
P-8	4. a)	Program to take input of a user name and consumed current units and print an electric bill which billing criteria is as follows v) First 50 units has minimum charge 100tk vi) Next 200 units cost 2.50 TK/unit vii) Next 250 units cost 3.50 TK/unit viii) Units above 500 are charged at a rate 5.00TK/unit Make sure you implement the idea using user-defined function.	
P-9	4. b)	Program to take input of a user name and yearly income and print income tax where the taxation criteria is as follows vi) First 250000 is tax free vii) 5% tax for next 250000 viii) 10% tax for next 500000 ix) 20% tax for next 4000000 x) 40% tax for income above 5000000 Make sure you implement the idea using user-defined function.	
P-10	4. c)	Program to take input of a user name and minutes spent talking on the telephone and print a telephone bill which billing criteria is as follows iv) First 150 minutes is free of cost v) Next 250 calls (151-400 minute) are charged at the rate of 1 TK/minute vi) And all calls after 400 minutes, are charged at the rate of 2/minute Make sure you implement the idea using user-defined function.	
P-11	4. d)	Program to take input of the name an of third year student of Applied Mathematics, RU and marks obtained in all courses including LAB and viva, and print the overall GPA in year three following the standard grading criteria of Applied Mathematics.	
P-12	5. a)	Program to find the dominant eigenvalue and corresponding eigenvector of a given non-diagonal square matrix.	

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P-13	5. b)	Program to find the inverse of a given square matrix using row-elementary operations.	
P-14	5. c)	Program to find the determinant of square matrix using row-elementary operations.	
P-15	6. a)	Program to solve a system of n linear equations by using Gauss's Elimination method.	
P-16	6. b)	Program to solve a system of n linear equations by using Cramer's rule.	
P-17	7. a)	Write an Object-Oriented Program (OOP) to find the smallest and largest distance between any two points taken from a randomly given set of n points.	
P-18	7. b)	Write an OOP to find the roots of a general quadratic equation.	
P-19	7. c)	Write an OOP to read a matrix, display the sum of its diagonal elements, lower-diagonal elements and upper-diagonal elements.	