Jadavpur University
Session 2022-2023, Odd Semester
Computer Programming and Numerical Methods

1. Write a menu-driven program for solving a system of linear equations using Gauss-Elimination method, Jacobi's method and Gauss Elimination with pivoting method

2. Using the above program solve the following system of equations :

i. $x + y + z = 6$
$x + y - z = 0$
$x - y + z = 2$

ii. $x_1 + x_2 + x_3 = 3$
$2x_1 + 3x_2 + x_3 = 6$
$x_1 - x_2 - x_3 = -3$

iii. $2x_1 + 4x_2 + 2x_3 = 15$
$2x_1 + x_2 + 2x_3 = -5$
$4x_1 + x_2 - 2x_3 = 0$

3. Write a menu-driven program for implementing Interpolation using Lagrange's formula, Newton's forward difference formula, and Newton's backward difference formula.

4. For the following table of values:

x	1	2	3	4
f(*x*)	1	8	27	64

Find *f*(2.5) using all three methods and comment on your answer

5. An experiment gave the following table of values for the dependent variable *y* for a set of known values of *x*. Obtain an appropriate least squares fit for the data.

x	1	2	3	4	5	6	7	8	9
y	5.5	7.0	9.6	11.5	12.6	14.4	17.6	19.5	20.5