

Q. 1	Solve Any one of the following.
A)	Apply Gauss elimination method to solve the equations $x + 4y - z = -5$; $x + y - 6z = -12$; $3x - y - z = 4$. Answer ---- x=1.6479, y= -1.1408, z = 2.0845
B)	Find the roots of equation $x^3 - 4x - 9 = 0$, using the Bisection method correct to three decimal places. Ans – Root is -- 2.7064
Q.2	Solve Any one of the following.
A)	Find the positive roots of $x^4 - x = 10$ correct to three decimal places using Newton - Raphson method. Ans -- x₂ = x₃= 1.856
B)	If P is the pull required to lift W by means of a pulley block, using Least Square method find a linear law of the form $P = mW + c$ connecting P and W, using the following data: P = 12 15 21 25 W = 50 70 100 120 Where, P and W are taken in KN, Compute P When W = 150KN . Ans. --- P=30.4635KN
Q. 3	Solve Any one of the following.
A)	Find f(22) from Gauss forward formula: x : 20 25 30 35 40 45 f(x) : 354 332 291 260 231 204 Ans -- f(22)=347.983
B)	Given the value below , evaluate f(9), using Lagrange's formula x : 5 7 11 13 17 y : 150 392 1452 2366 5202 Ans = 810
Q.4	Solve Any one of the following.
A)	Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using (i) Trapezoidal rule (ii) Simpson's 1/3 rule (iii) Simpson's 3/8/ rule, compare the results with its actual value. Ans --- (i) 1.4108, (ii) 1.3662 , (iii) 1.3571
B)	Using Euler's method, find an approximate value of 'y' corresponding to x = 1, given that $dy/dx = x + y$ and y = 1 when x = 0 Ans --- y = 3.18
Q. 5	Solve Any one of the following.
A)	Apply Ranga Kutta fourth order method to find an appropriate value of y when x = 0.2 given that $dy/dx = x + y$ and y = 1 when x = 0 Ans – 1.2428
B)	Using the finite difference method, find y(0.25),y(0.5), and y(0.75) satisfying the differential equation $\frac{d^2y}{dx^2} + y = x$, subject to the boundary conditions y(0) = 0, y (1) = 2 Ans --- y(0.25)=0.5443, y(0.5)=1.0701, and y(0.75)=1.5604