Full Marks 100

Time: Two hours/Three hours/Four hours/ Six hours   (50 marks for part I)

	Use a separate Answer-Script for each part PART – I	
1. a. b.	Write algorithm of following methods: **(CO6)** *Lagrange Interpolation Method* *Newton Raphson Method*	10
2.	Using *Runge Kutta Method of order 4*, find y (0.4) given that dy/dx = $(2x^2+3y)$, y (0) = 1. Take h=0.2. **(CO4)** **OR** Use *method of false position* to solve the following equation Correct to three decimals, starting with the approximation (2, 2.5). Show *maximum 5 iterations* in tabular form with *only one sample calculation.* **(CO4)** $e^x + \log x = 8.835$	10 10
3.	Certain experimental values of x and y are given below. Form an Exponential Function in the form of y=ae^{bx} , using **Least Square Method**. Find value of y when x=45.	10

X	10	20	40	52	60
Y	50	110	220	280	300

4.	Find the dominant eigen-value and corresponding eigen-vector of [P] using Power method with initial approximation [1 1 1]^{T} **CO5** $[P] = \begin{bmatrix} 1 & 3 & -1 \\ 3 & 2 & 4 \\ -1 & 4 & 10 \end{bmatrix}$	10
5.	Find the approximate solution of the following integral using Trapezoidal Method and Simpson's 1/3rd rule taking *n*=number of divisions = 6 **(CO5)** $\int_0^{12} \dfrac{dx}{1 + x^2}$	10

Name of the Examination: B.E. CIVIL ENGINEERING FIRST YEAR SECOND SEMESTER - 2024

Subject :COMPUTER PROGRAMMING & NUMERICAL METHODS

Time : 3 Hours   Full Marks: 100

PART-II (50 Marks)

Instructions:	
I	All notations represent their standard relevant meaning.
II	If you feel that any data or condition is/are missing in any question, please assume relevant inputs and mention the same.
III	Make sure in the examples, input outputs, statements mentioned by you, none of your personal information like Name, Class roll no, registration number etc.are mentioned or indicated.

Sl No	Question	Marks	CO
1	Write a FORTRAN program that displays the summation of internal angles in degrees for a closed polygon with number of side of the polygon as user input. Show suitable input output statements.	6	CO2
2	Write a FORTRAN program using array to perform matrix addition of 3 matrices each of dimension 4x3. Show relevant input output statements.	12	CO1
3	Explain 'arithmatic if' statement with flowchart to discuss the logic of 'nested if' statement and write any FORTRAN program using 'nested if' as example with relevant input output statements.	10	CO1
4	Write a FORTRAN program that can display area of a circle after it reads the value of radius of the circle as real number from an existing text file named as input.prob4.txt which is kept in an existing folder of the used computer with the given path: E: Fortran inputs>New Folder>My Inputs>Problem 4 Show relevant input output statements.	12	CO2
5	Write a FORTRAN program using any type of sub-program that will display summation of odd numbers from 0 (zero) to 'n' where 'n' will be user input. Show suitable input output statements.	10	CO6