REG.NO.:

VIT

Vellore Institute of Technology

SCHOOL OF CHEMICAL ENGINEERING
CONTINUOUS ASSESSMENT TEST -II
FALL SEMESTER 2025-2026

SLOT: C2+TC2

Programme Name & Branch : B.Tech (Chemical Engineering)
Course Code : BCHE201L
Course Name : Computational Methods in Chemical Engineering
Faculty Name(s) : Dr Monash P/ Dr Anand V P Gurumoorthy
Faculty Emp ID : 14831/13332
Class Number(s) : VL202526101225/VL202526101221
Date of Examination : 7 October 2025
Exam Duration : 90 minutes

Maximum Marks: 50

General instruction(s):

- Answer all questions, Open book and notes test.

Q. No	Question	Marks	Course Outcome (CO)	Bloom's Taxonomy (BL)
1.	Determine the constants a and b by the method of linear regression such that $y = ae^{bx}$ fits the following data: x: 2, 4, 6, 8, 10 y: 4.077, 11.084, 30.128, 81.897, 222.62	10	3	3
2.	Find the maximum of $f(x) = 2x - 1.75x^2 + 1.1x^3 - 0.25x^4$ using Golden section search (a = -2 , b = 4). Carry out three steps.	10	4	3
3.	Maximize: $Z = 12x_1 + 3x_2 + x_3$ Subject to: $10x_1 + 2x_2 + x_3 \leq 100$ $7x_1 + 3x_2 + 2x_3 \leq 77$ $2x_1 + 4x_2 + x_3 \leq 80$ $x_1, x_2, x_3 \geq 0$	10	4	3
4.	Apply multiple application of Trapezoidal rule, Simpson's 1/3rd rule and Simpson's 3/8th rule to evaluate the integral: $I = \int_0^1 \sqrt{1 - x^2}\, dx$ for number of segments n=6.	10	4	3
5.	Consider the initial value problem: $\frac{dy}{dx} = x(y + x) - 2, \qquad y(0) = 2$ Use Euler's method with step sizes h = 0.3 and h = 0.2 to compute approximations to y(0.6) (5 decimals).	10	5	3

Course Outcomes:

3 Select suitable numerical regression and interpolation techniques for data analysis
4 Compute numerical integration and optimization
5 Determine the numerical solution for ordinary and partial differential equations

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