



Daffodil International University

Faculty of Science & Information Technology (FSIT)

Department of Computer Science and Engineering (CSE)

Final Examination, Spring 2025

Course Code: CSE 235, Course Title: Numerical Methods

Time: 02 Hours

Level-2, Term-2

Marks: 40

Answer ALL Questions:

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially]

1	a)	Apply Gauss Elimination Method to solve the system of linear equations: $2x+5y+z+t=16$ $3x+y-t+z=11$ $2z+t+x=6$ $5z-2t=0$	[7]	CO2										
	b)	Solve the System of Linear Equations using the Gauss Seidel's Method: $2x+7y-2z=16$ $5x+y+3z=11$ $2z-x=1$ Use the initial guess $x_0 = y_0 = z_0 = 0$ and iterate until the solution converges three decimal places.	[6]											
2		Evaluate the approximate value of $I = \int_{0.2}^{1.4} \frac{3 \sin x}{\sin x + \cos x} dx$ by using Trapezoidal, Simpson's 1/3, Simpson's 3/8 and Weddle's rule. Find the Exact Value of I and then Compare and Comment on it.	[15]	CO3										
3	a)	Determine the Second Degree Polynomial using Least Square method which fits to the following data: <table border="1"><tr><td>x</td><td>2.2</td><td>2.4</td><td>2.6</td><td>2.8</td></tr><tr><td>y</td><td>6.1</td><td>11.3</td><td>18.5</td><td>27.7</td></tr></table> Hence, find $y(10)$.	x	2.2	2.4	2.6	2.8	y	6.1	11.3	18.5	27.7	[6]	CO3
x	2.2	2.4	2.6	2.8										
y	6.1	11.3	18.5	27.7										
b)	Estimate the value of $y(10)$ for which the following data fits the Exponential Equation $y = ae^{bx}$ <table border="1"><tr><td>x</td><td>1.4</td><td>1.6</td><td>1.8</td><td>2.1</td><td>2.2</td></tr><tr><td>y</td><td>2.0</td><td>3.5</td><td>5.3</td><td>6.0</td><td>7.5</td></tr></table>	x	1.4	1.6	1.8	2.1	2.2	y	2.0	3.5	5.3	6.0	7.5	[6]
x	1.4	1.6	1.8	2.1	2.2									
y	2.0	3.5	5.3	6.0	7.5									