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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: Hence, find **y(10).**	[6]	CO3
	b)	**Estimate** the value of $y(10)$ for which the following data fits the **Exponential Equation** $y=ae^{bx}$	[6]	

x	2.2	2.4	2.6	2.8
y	6.1	11.3	18.5	27.7

x	1.4	1.6	1.8	2.1	2.2
y	2.0	3.5	5.3	6.0	7.5