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Question easy but time Management

Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Final Examination, Spring 2026
Course Code: CSE226, Course Title: Numerical Methods
Level: 2 Term: 3, Batch: 66

Time: 2:00 hrs. **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-Jacobi method to solve the following system of linear equations until converges correct to 3 decimal places by considering initial guess $x_0 = y_0 = z_0 = 0$. **[7]** **CO2**

$$4x - 10y + 3z = -3$$
$$x + 6y + 10z = -3$$
$$10x - 5y - 2z = 3$$

(b) Identify the first derivative of x=1.1 from the following table **[3]**

x	1.0	1.1	1.2	1.3	1.4
y	7.989	8.403	8.781	9.129	9.451

2. Apply Runge-Kutta method of 4th order to calculate approximate value of y (0.1) and y (0.2) of $\frac{dy}{dx} = x - y^2, y(0)=1$ correct to 4 decimal places. **[10]**

3. Identify the best method among Weddle's, Simpson's 1/3rd and Simpson's 3/8th to compare with the exact value, by solving the integral of $I = \int_{0.5}^{0.8} \sqrt{x}\, e^{-x}\, dx$ **[10]** **CO3**

4. (a) Certain experimental data of x and y are given as (0,-1), (2, 5), (5, 12), (7, 20). If the straight line $y = a_0 + a_1 x$ is fitted to the given data by applying least square method, find out the approximate values of a_0 and a_1. **[4]**

(b) Develop the second degree polynomial by using least square method for the following data: **[6]**

x	1	3	4	6
y	0.63	2.05	4.08	10.78