ourdiu.com | Shared by Ahnab Shariar

Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Final Examination, Summer 2026
Course Code: CSE226, Course Title: Numerical Methods
Level: 2 Term: 3, Batch: 67

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-Seidel iteration method to solve the following system of linear equations until converges correct to 3 decimal places by considering initial guess $x_0 = y_0 = z_0 = 0$. $-2x+7y+2z=5$ $6x-2y+z=11$ $x+2y-5z=-1$	[6]	CO2
	(b) Identify the local maximum and local minimum values of y from the following data x: 0, 2, 4, 6 y: 2, 0, -50, -196	[4]	
2.	Apply Runge-Kutta method of 4th order to calculate approximate values of $y(0.2)$ and $y(0.4)$ of $\frac{dy}{dx}=1+y^2$, $y(0)=0$ 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 its exact value of $I=\int_0^{\pi/2}\sqrt{1-0.162\sin^2 x}\,dx$	[10]	CO3
4.	(a) Develop the second degree polynomial by using least squares method for the following data: x: 0, 1, 2, 3, 4 y: 1, 5, 10, 22, 38	[5]	
	(b) Certain experimental data of x and y are given respectively as (1, 2.473), (3, 6.722), (5, 18.274), (7, 49.673), (9, 135.026). If a curve $y=ae^{bx}$ is fitted to the given data, find out the desired curve by applying least squares method.	[5]	