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Daffodil International University
Faculty of Science & Information Technology
Department of Software Engineering
Final Examination, Summer 2026
Course Code: SE341; Course Title: Numerical Analysis
Sections & Teachers: A, B, C, D (RT), E(TR)

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)*	**Demonstrate** the concept of nonlinear equations and **examine** the methods used to find the root of nonlinear equation	[Marks-3]	CLO-3 *Level-3*
	b)	**Calculate** the root of the equation $f(x) = x^3+x^2+2x-5 = 0$ using the Secant Method correct to four decimal places, starting with initial guesses $x_0 = 1$ and $x_1 = 2$. Perform the necessary iterations of the method until the root is approximated and show your step-by-step calculations.	[Marks-5]	
	c)	**Compute** the root of the equation $f(x) = x^4-5x^2-3x-5=0$ using the Newton Raphson Method with 4 decimal points allowed.	[Marks-5]	
	d)	**Express** the concept of numerical differentiation and approaches to solve it.	[Marks-5]	
	e)	**Derive** the first derivative of the function $f(x)=2e^{2x} + x^3$ at x=2, at decreasing values of h from 0.4 to 0.2, with a step size of 0.05 using backward differentiation. Round the value to 4 decimal places.	[Marks-5]	
	f)	**Illustrate** the idea of gauss elimination, merits and demerits of gauss elimination. **Express** the difference between gauss elimination and gauss elimination with partial pivoting.	[Marks-7]	
2.	*a)*	**Determine** the value of x, y and z of the following equations using LU Decomposition. $x+y+z=6$ $2x+3y+z=9$ $x+4y+2z=17$	[Marks-10]	CLO-4 *Level-5*