



Daffodil International University
Faculty of Science & Information Technology (FSIT)
Department of Computer Science and Engineering
Midterm Examination, Spring 2024
Course Code: CSE 235, Course Title: Numerical Methods
Level-2, Term-2

Time: 01:30 Hours

Marks: 25

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)	Explain Absolute Error and Relative Error.	[2]	CLO1										
	b)	Interpret the value of $\sqrt{331} + \sqrt{257} + \sqrt{191} + \sqrt{119}$ to 4 significant digits and find its absolute, relative and percentage error .	[3]											
2	a)	Solve, $3x + \sin x = e^x$ by using Bisection method to the accuracy of 10^{-3} .	[6]	CLO2										
	b)	Identify the approximate root of $e^{-x} (3.2 \sin x - 0.5 \cos x) = 0$ that lies on $[3, 4]$ accurate to 4 decimal places.	[4]											
3	a)	Estimate the value of x , when $\sqrt[3]{x} = 3.756$ from the given table by using Lagrange's interpolation : <table><tr><td>x</td><td>50</td><td>52</td><td>55</td><td>59</td></tr><tr><td>$\sqrt[3]{x}$</td><td>3.684</td><td>3.732</td><td>3.779</td><td>3.825</td></tr></table>	x	50	52	55	59	$\sqrt[3]{x}$	3.684	3.732	3.779	3.825	[5]	CLO3
x	50	52	55	59										
$\sqrt[3]{x}$	3.684	3.732	3.779	3.825										
	b)	Evaluate the difference table to find the polynomial which takes the values: <table><tr><td>x</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>$f(x)$</td><td>1</td><td>2</td><td>1</td><td>10</td></tr></table>	x	0	1	2	3	$f(x)$	1	2	1	10	[5]	
x	0	1	2	3										
$f(x)$	1	2	1	10										

Good Luck!!!