



**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 <b>absolute, relative and percentage error</b> .	[3]											
2	a)	Solve, $3x + \sin x = e^x$ by using <b>Bisection method</b> 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 <b>Lagrange's interpolation</b> : <table border="1"><tr><td><math>x</math></td><td>50</td><td>52</td><td>55</td><td>59</td></tr><tr><td><math>\sqrt[3]{x}</math></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 <b>find the polynomial</b> which takes the values: <table border="1"><tr><td><math>x</math></td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td><math>f(x)</math></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!!!**