



Daffodil International University

Faculty of Science & Information Technology (FSIT)

Department of Computer Science and Engineering

Midterm Examination, Fall 2024

Course Code: CSE 226, Course Title: Numerical Methods

Level-2, Term-2

Batch-64

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)	Indicate Five uses of Numerical Methods in Computer Science.	[2]	CO1																
	b)	Interpret the value of $\sqrt{301} + \sqrt{157} + \sqrt{91} + \sqrt{217}$ to 5 significant digits and find its Absolute, Relative and Percentage Error.	[3]																	
2	a)	Identify the approximate root of, $4\sin x - e^x = 0$ lies between (0, 1) using the Method of False Position correct up to Four Decimal Places.	[5]	CO2																
	b)	Solve the algebraic equation, $x^3 - 2x^2 - 4 = 0$ using The Newton Raphson Method correct up to Five Decimal Places.	[5]																	
3	a)	The table gives the distance in nautical miles of the visible horizon for the given heights in feet above the earth's surface: <table border="1"><tr><td>x (height)</td><td>100</td><td>150</td><td>200</td><td>250</td><td>300</td><td>350</td><td>400</td></tr><tr><td>y (distance)</td><td>10</td><td>13</td><td>15</td><td>16</td><td>18</td><td>19</td><td>21</td></tr></table> Evaluate the difference table to find the distance when the height is 170.	x (height)	100	150	200	250	300	350	400	y (distance)	10	13	15	16	18	19	21	[5]	CO3
x (height)	100	150	200	250	300	350	400													
y (distance)	10	13	15	16	18	19	21													
b)	Estimate the value of, $f(x)$ at $x = 8$, from the given table by using Lagrange's Interpolation:	[5]																		
		<table border="1"><tr><td>x</td><td>3</td><td>7</td><td>9</td><td>10</td><td>12</td></tr><tr><td>f(x)</td><td>35</td><td>51</td><td>62</td><td>67</td><td>77</td></tr></table>	x	3	7	9	10	12	f(x)	35	51	62	67	77						
x	3	7	9	10	12															
f(x)	35	51	62	67	77															

Good Luck!!!