

Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Mid Examination, Spring 2025
Course Code: MAT101, Course Title: Mathematics-1

Level: L1 Term: T1 Batch: 68

Time: 01:30 Hrs

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)	Demonstrate the prime factorization of 3600 using the tree diagram. Also, find all factors and sum of the composite factors.	3	CO1
	<i>b)</i>	Three bells ring at interval of 12 minutes, 21minutes, and 28 minutes respectively. If they all ring together at 11:00 AM, find the time when they will ring together?	2	
2.	a)	If $7^x + 7^{1-x} = 8$ then find the value of x.	2	CO1
	b)	Demonstrate the solution of the inequality $\frac{x^2 + 12x + 35}{x^2 - 6x + 9} \le 0$ using sign table.	3	
3.	a)	Apply the Remainder Theorem for solving the following polynomial equation	5	COA
		$x^6 + 12x^5 + 46x^4 + 52x^3 - 15x^2 = 0$		CO2
4.	a)	If $y = \sin^{-1}(e^{\ln(\sin x)})$ and $z = x^{x^{*}}$ then examine the rate of change of z with	5	CO3
		respect to y or $\frac{dz}{dy}$.		
	b)	Examine the rate of change of y with respect to x or $\frac{dy}{dx}$ of the function	5	
		$y = \tan^{-1} \sqrt[4]{\frac{1-x}{1+x}} + \tan^{-1} \left(\frac{\cos x}{1+\sin x}\right)$		