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Daffodil International University

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

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
	b)	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 $x^6+12x^5+46x^4+52x^3-15x^2=0$	5	CO2
4.	*a)*	If $y=\sin^{-1}\left(e^{\ln(\sin x)}\right)$ and $z=x^{x^x}$ then examine the rate of change of z with respect to y or $\frac{dz}{dy}$.	5	CO3
	b)	Examine the rate of change of y with respect to x or $\frac{dy}{dx}$ of the function $y=\tan^{-1}\sqrt{\frac{1-x}{1+x}}+\tan^{-1}\left(\frac{\cos x}{1+\sin x}\right)$	5	