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Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science and Engineering
Mid Semester Examination, Fall-2024
Course Code: MAT101 Course Title: Mathematics-I
Level: L1 Term: T1 Batch: 67

Exam Duration: 1.5 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)*	Demonstrate the prime factorization of 2600 using the multiplication method. Also, find all prime factors and composite factors.	3	CO1
	b)	Find the LCM and HCF of 600, 336, and 816 using factorization.	2	
2.	*a)*	Find the value of $\sqrt{56+\sqrt{56+\sqrt{56+\cdots\cdots}}}$.	2	CO1
	b)	Demonstrate the solution of the inequality $\frac{x^2+2x-15}{x+2} \geq 0$ using sign diagram.	3	
3.		Apply the Remainder Theorem for solving the following polynomial equation $2x^4 + 19x^3 + 128x^2 + 291x - 180 = 0$	5	CO2
4.	*a)*	Examine the rate of change of y with respect to x or $\frac{dy}{dx}$ of the function $y = a^x x^4 \tan^{-1} x + \frac{\cos x}{1+\sin x}$	5	CO3
	b)	Examine the rate of change of y with respect to x or $\frac{dy}{dx}$ of the function $y = (\sec x)^{\sqrt{x}} + \ln(\cos(e^x))$	5	