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 $\sqrt{56 + \sqrt{56 + \sqrt{56 + \cdots}}}$.	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 $$y = a^x x^4 \tan^{-1} x + \frac{cosx}{1+sin x}$$	5	CO3
	b)	Examine the rate of change of y with respect to x or $\frac{dy}{dx}$ of the function $$y = (secx)^{\sqrt{x}} + \ln(\cos(e^x))$$	5	