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Daffodil International University

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

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)***	Find the Prime Factorization of 1880 using Tree diagram. Also find the sum of its composite factors.	**3**	**CO1**
	b)	Find the Highest Common Factor (HCF) of $\frac{8}{27}, \frac{32}{243}, \frac{100}{81}$	**2**	
2.	***a)***	What is the value of x and y, when $(25)^x \cdot 5^{2y} = 625$ and $(27)^{x+3y} = 9^7$.	**2**	**CO1**
	b)	Choose the values of a & b, if $\frac{11+3\sqrt{3}}{7-5\sqrt{3}} = a + b\sqrt{3}$	**3**	
3.	***a)***	Apply the Remainder Theorem for solving the following polynomial equation $x^4 + x^3 - 2x^2 - 6x - 4 = 0$	**5**	**CO2**
4.	***a)***	Identify the rate of change of y with respect to x or $\frac{dy}{dx}$ of the function $y = (\sin x)^x + \tan(\ln x)$	**5**	**CO3**
	b)	Identify the rate of change of y with respect to x or $\frac{dy}{dx}$ of the function $y = e^{-3x} + 2x^3 \sec x - \frac{x+3}{\cos x}$	**5**	

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