

Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science and Engineering
Final Examination, Spring 2024

Course Code: MAT211, Course Title: Engineering Mathematics

Level: L2 Term: T1 Batch: 64

Time: 2 Hrs

Marks: 40

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) Solve $x^3 \frac{d^3 y}{dx^3} + 3x^2 \frac{d^2 y}{dx^2} + x \frac{dy}{dx} + y = x \ln x$.	[7]	CO2
	b) Identify y_p for the ODE $D^3 y - 2Dy + 4y = e^x \cos x$.	[4]	
2.	a) Evaluate $\mathcal{L}\{4 \cos^2 t + 3 \sin^2 t\}$.	[5]	CO3
	b) Evaluate $\mathcal{L}\{e^{2t} \sin 2t \cos 2t\}$.	[6]	
3.	a) Determine the value of $\mathcal{L}^{-1}\left\{\frac{1}{s^2 - 4s + 3}\right\}$ using convolution theorem.	[5]	CO3
	b) Determine $f_s(n) + f_c(n)$ for $F(x) = e^{-2x} + e^{4x}$, $0 < x < \infty$.	[6]	
4.	Solve $Y''(t) + 4Y(t) = \cos t$, $Y(0) = Y'(0) = 0$.	[7]	CO4