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Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science and Engineering
Final Examination, Summer 2026
Course Code: MAT211, Course Title: Engineering Mathematics
Level: L2 Term: T1 Batch: 69

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.		Solve $x^3\frac{d^3y}{dx^3} - x^2\frac{d^2y}{dx^2} + 2x\frac{dy}{dx} - 2y = x^5$	[6]	CO2
2.	*a)*	Simplify (i) $\mathcal{L}\left\{sinh\,7t - 2t^4 + 3\cos\frac{t}{8} - 20\right\}$ (ii) $\mathcal{L}\{e^{-t}(sin^2 4t - 5)\}$	[4] [4]	CO3
	b)	Inspect the result of (i) $\mathcal{L}^{-1}\left\{\frac{e^{-2s}(3s-1)}{s^2+6s+8}\right\}$ (ii) $\mathcal{L}^{-1}\left\{\frac{s}{(s+1)(s^2+9)}\right\}$ using Convolution theorem.	[5] [5]	
3.	*a)*	Solve $Y''(t) + 6Y'(t) + 8Y = e^t$, $Y(0) = 1, Y'(0) = 0$ using Laplace transform	[6]	CO4
	b)	(i) Construct the definition of Fourier Sine and Cosine Transform. (ii) Construct $f_s(n)$ for $F(x) = 3x^2,\ 0 < x < \pi$	[2] [3]	
	c)	Develop the Fourier series of $F(x) = cosmx,\ -\pi < x < \pi$	[5]	

$(-1)^n$