



Daffodil International University
Department of Electrical and Electronic Engineering
Faculty of Engineering
Final Examination, Summer – 2026

Course Code: 0714-217

Section: A, B, C, D, E, F, G

Full Marks: 40

Course Title: Continuous Signals & Linear Systems

Level-Term: L2-T1

Exam Date: August 22, 2026

Teacher's Initial: MFI, SRH

Time: 2 Hours

Answer all the following Questions

- Q1. Determine the Laplace transform $X(s)$ and illustrate the pole-zero plot with the ROC for the signal $x(t) = e^{-3t}u(t) + e^{2t}u(-t)$.

CO-2 [5]
C(3)

- Q2. Consider the RC circuit shown in Fig. 1. The switch is closed at $t = 0$. Assume that there is no initial voltage on the capacitor. Using Laplace transform determine the step response of the following circuit.

CO-2 [5]
C(4)

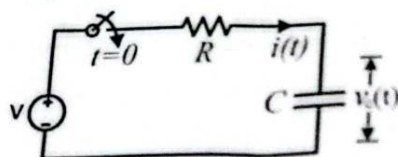


Fig. 1. RC circuit

- Q3. The output $y(t)$ of a continuous time LTI system is found to be $2e^{-3t}u(t)$ when the input is a unit step function. Using Laplace transform Determine the output $y(t)$ when the input $x(t)$ is changed to $e^{-t}u(t)$.

CO-2 [5]
C(4)

- Q4. Consider the periodic square wave $x(t)$ shown in Fig. 2. Determine the complex exponential Fourier series and the trigonometric Fourier series of $x(t)$.

CO-2 [5]
C(5)

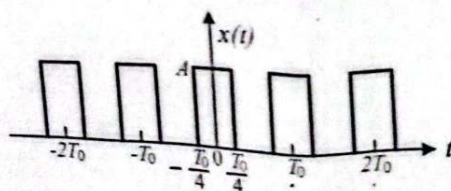


Fig. 2. Periodic square wave

- Q5. If $h_1 = e^{-2t}u(t)$ and $h_2 = 2e^{-t}u(t)$ then determine the overall impulse response $h(t)$ for the continuous time LTI system given in Fig. 3.

CO-2 [5]
C(4)

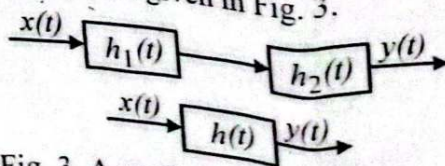


Fig. 3. A continuous time LTI system

- Q6. Consider a continuous-time LTI system described by $\frac{dy(t)}{dt} + 2y(t) = x(t) + \frac{dx(t)}{dt}$. CO-2 [5]
C(4)
Determine the: (i) transfer function (ii) frequency response (iii) impulse response of this system.

- Q7. **Find** the Fourier transform of the rectangular pulse signal $x(t)$ given in Fig. 4. CO-2 [10]
C(4)

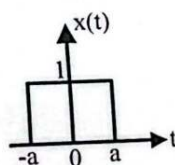


Fig. 4. Rectangular pulse signal

Then using duality property **determine** the Fourier transform of the signal $x(t) = \frac{\sin at}{\pi t}$