



**Daffodil International University**  
Department of Electrical and Electronic Engineering  
Faculty of Engineering  
**Final Examination, Fall – 2025**

Course Code: EEE-0714-217  
Section: A, B, C, D, E  
Full Marks: 40

Course Title: Continuous Signals & Linear Systems  
Level-Term: L2-T1  
Exam Date: December 24, 2025  
Teacher's Initial: MFI  
Time: 2 Hours

*Answer all the following Questions*

- Q1. Find the Laplace transform  $X(s)$  and sketch the pole-zero plot with the ROC for the signal  $x(t) = e^{-2t}u(t) + e^{-3t}u(t)$ . CO-2 [8]  
C(4)

- Q2. Consider the RC circuit shown in Fig. 1. The switch is closed at  $t = 0$ . Assume that there is an initial voltage on the capacitor and  $v_c(0^-) = v_0$ . (i) Find the current  $i(t)$  and the voltage across the capacitor  $v_c(t)$ . CO-2 [8]  
C(4)

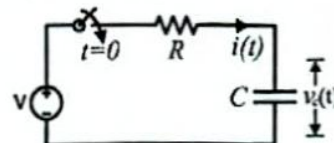


Fig. 1. RC circuit

- Q3. 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 [8]  
C(5)

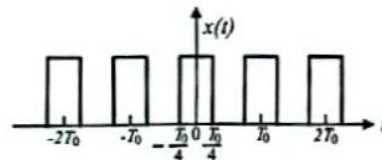


Fig. 2. Periodic square wave

- Q4. Consider a continuous-time LTI system described by  $\frac{dy(t)}{dt} + 2y(t) = x(t)$ . Using the Fourier transform, find the output  $y(t)$  to each of the input signals: (i)  $x(t) = e^{-t}u(t)$  (ii)  $x(t) = u(t)$ . CO-2 [8]  
C(4)

- Q5. Derive state variable matrices for the continuous time LTI system given in Fig. 3. CO-2 [8]  
C(6)

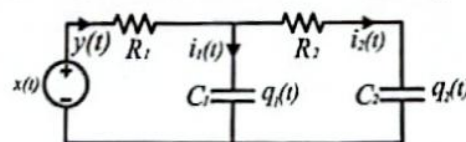


Fig. 3. Continuous time LTI system