



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)

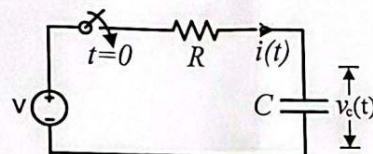


Fig. 1. RC circuit

- 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)

$$\frac{2}{s+3}$$

- 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)

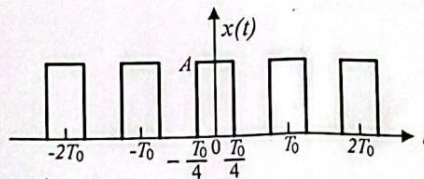


Fig. 2. Periodic square wave

$$x(t) = \sum_{k=-\infty}^{\infty} A \cdot \text{rect}\left(\frac{t}{T_0}\right) \cdot e^{jk\omega_0 t}$$

- 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)

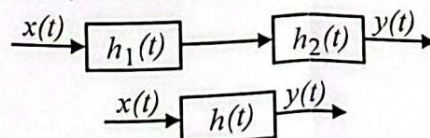


Fig. 3. A continuous time LTI system

- 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)

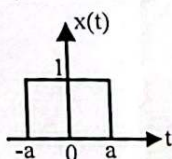


Fig. 4. Rectangular pulse signal

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