Department of Electrical and Computer Engineering

Fall 2023 COMPREHENSIVE/BREADTH EXAM

Question 1   Laplace Transforms
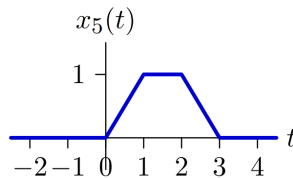
This problem has 2 parts.

Part 1
Determine the Laplace Transform and region of convergence for the signals shown below:

a) Signal 1

$$x_3(t) = |t|e^{-|t|}$$

b) Signal 2

$x_5(t)$

Part 2
Determine the inverse Laplace Transform of the following signal over the following two regions:

a) Region 1: t<0
b) Region 2: t>0

$$X_3(s) = \frac{s+1}{s^2 + 2s + 2}$$