

GEORGIA INSTITUTE OF TECHNOLOGY
School of Electrical and Computer Engineering

Course EE 2250
Electric Circuit Analysis

Assigned: February 11, 1999
Due: February 19, 1999

Problem Set #6

Reading: Read the following sections from Dorf and Svoboda:
Chapter 14, Sections 14.3–14.5, 14.8–14.9; (Laplace transforms)

Problem 6.1: Determine the Laplace transforms of the following time waveforms.

- (a) $x_a(t) = \begin{cases} 1, & 0 \leq t \leq T \\ 0, & \text{otherwise} \end{cases}$
- (b) $x_b(t) = t^2 e^{-3t}, t > 0$
- (c) $x_c(t) = e^{-4t} \sin 5t, t > 0$
- (d) $x_d(t) = t, t > 0$

Problem 6.2: Find the inverse Laplace transform of

$$X(s) = \frac{2s + 6}{s(s^2 + 3s + 2)}.$$

Problem 6.3: Find the inverse Laplace transform of

$$X(s) = \frac{s + 3}{s^3 + 3s^2 + 6s + 4}.$$

Problem 6.4: Find the inverse Laplace transform of

$$X(s) = \frac{5s - 1}{s^3 - 3s - 2}.$$

Problem 6.5: Using the Laplace transform, find $v_{out}(t)$ for $t > 0$ for the circuit shown below. The initial value of $v_{out}(t)$ at $t = 0$ is zero.

