

Test #1 Overview

Material covered

- Chapters 1 - 3 (omit section 3.5) in Electric Circuits, 7th Edition by Nilsson
- Homework Assignments 1-2

Format

- Problems will mainly be similar to class examples, textbook examples, and homework problems
- A small part (typically 15% or less) of the test might be multiple choice, fill-in-the blank, true/false, etc.
- Number of problems: This varies, but 6-8 might be typical. Some problems may have multiple parts.
- There is generally some time-pressure on the tests. Practice enough problems so that you can work them quickly or you will probably run short on time. Work the easiest problems first.

Chapter 1 Topics (30 – 40%)

Definitions and relationships for charge, current, voltage, power, and energy.

$$i(t) = \frac{dq(t)}{dt}$$

$$q(t) = \int_0^t i(t)dt + q(0)$$

$$v(t) = \frac{dW}{dq}$$

$$p(t) = \frac{dW}{dt} = v \cdot i$$

$$w(t) = \int_0^t p(t)dt + w(0)$$

Problems might involve functions, graphs, or other information.

Correct units must be used. Also be familiar with SI prefixes.

The use of *passive sign convention* and *active sign convention* for calculating power absorbed or power delivered.

Calculating energy costs.

Chapter 2-3 Topics (60 – 70%)

Resistance

- Physical properties
- Ohm's Law
- Passive sign convention
- Power calculations
- Conductance

$$R = \frac{\rho \cdot l}{A}$$

Voltage sources and Current sources

- Independent sources
- Dependent sources
- Combinations of sources

Kirchhoff's Voltage Law (KVL)

Kirchhoff's Current Law (KCL)

Series and Parallel elements

- Analysis of resistive circuits
- Series resistance
- Parallel resistance
- Series/parallel combinations
- Equivalent resistance
- Voltage division
- Current division

Power calculations in circuits ($P_{\text{delivered}} = P_{\text{absorbed}}$)