UNIT 3
STUDY GUIDE*

To pass the unit exam, you must be able to do the following (using books and notes):

CONCEPTUAL TOOLS	Learning Objective	Reading
RLC CIRCUITS C (CAPACITOR) EQUATIONS i = C dv/dt Series capacitors Parallel capacitors Initial conditions C = OPEN CIRCUIT CHARGE SHARING V SRC MODEL Final conditions open circuit Energy stored Example 1 (pdf) Example 2 (pdf) L (INDUCTOR) EQUATIONS v = L di/dt Series inductors Parallel inductors Initial conditions L = WIRE CURRENT DIVISION I SRC MODEL Final conditions wire Energy stored Example 1 (pdf) Example 2 (pdf)	3.1 For a specified current through an inductance, find the voltage across it, and vice versa. For a specified voltage across a capacitance, find the current through it, and vice versa. From the voltages and currents, find energy stored in inductances and capacitances. Find the equivalence of inductances in series and parallel and of capacitances in series and parallel.	Chap 6: Sec 6.1-6.3
RLC CIRCUITS GENERAL RC/RL SOLUTION General solution Time const Thev equiv Solution procedure Example 1 (pdf) Example 2 (pdf)	3.2 Find the natural response of any circuit containing just one inductance or one capacitance (or one equivalent inductance or one equivalent capacitance).	Chap 7: Sec 7.1-7.2
RLC CIRCUITS GENERAL RC/RL SOLUTION General solution Time const Thev equiv Solution procedure Example 3 (pdf) Example 4 (pdf)	3.3 Find the step-function response of any circuit containing just one inductance or one capacitance (or one equivalent inductance or one equivalent capacitance).	Chap 7: Sec 7.3

* The material in this handout is based extensively on concepts developed by C. H. Durney, Professor Emeritus of the University of Utah.

RLC CIRCUITS GENERAL RC/RL SOLUTION General solution Time const Thev equiv Solution procedure Example 5 | (pdf) Example 6 (pdf) Example 7 (pdf)	3.4	For given RC and RL circuits (containing only one equivalent storage element) give qualitative explanations based on the interpretations that: (1) uncharged capacitance looks initially like a short circuit and finally like an open circuit, and (2) inductance with no initial current looks initially like an open circuit and finally like a short circuit.	Chap 7: Sec 7.4
CIRCUITS MAX POWER XFER Example (pdf)	3.5	Apply the maximum power transfer theorem.	Chap 4: Sec 4.12
SUPERPOSITION CIRCUITS $V_{DC} + V_{DC}$ EXAMPLE 1 (PDF) EXAMPLE 2 (PDF)	3.6	Apply the principle of superposition.	Chap 4: Sec 4.13