

EE211 AC Circuits

Tips

1. Make a good 8.5x11" cheat sheet both sides. No worked problems, remember. The cheat sheet should really be a precise summary of Ch.7 and half of Ch.8
2. No matter how simple the problem do show me a circuit with voltage, current, polarities and directions labeled very clearly.
3. Do inundate me by showing me ALL your work.
4. Do tell what me what is given, what's to be found, and the problem solving approach you propose.
5. Sanity check and Underline the answer.
6. Keep thine eyes off thy neighbor's test paper!

Topics

1. What is a capacitor? How constructed? What is an inductor? How constructed? In terms of voltage current relation what's the bog difference between inductors/capacitors and the resistor?
2. Basic v-i relations
3. Given v or i solving for the other; graphing answer
4. Energy storage
5. Natural response of source free RL and RC
6. The exponential and its significance in RC and RL circuits
7. Solving source free response by finding initial conditions and then solving differential ewuation.

Practice

1. I have a 10 mH inductor. The voltage across and current through this inductor are known to be zero for time $t < 0$. For $t > 0$ the voltage across the inductor is $v(t) = t e^{-t}$. Determine an expression for the inductor current $i(t)$ and sketch $i(t)$. What is the energy stored at $t = 1 \text{ mS}$?
2. I have a 1 F capacitor whose voltage appears to be building up at a constant rate of 1V/second. Find the current
3. I have a 1F capacitor that is charged to 100V. What is the energy stored? A 10 ohm resistor is connected across the capacitor. Find an expression for the current and, by integration, show that the energy dissipated from $t = 0$ to $t = \infty$
4. For the first order, linear, constant coefficient, ordinary differential equation $dy/dt + 2y = 0$ write the characteristic equation and natural response.
5. 7th Ed. Of text P.8.25
6. 7th Ed. Of text P.8.26
7. 7th Ed. Of text P.8.45

Solutions will be posted Tuesday, 2/19