

Department of Electrical Engineering and Computer Science
ENGR 210. Introduction to Circuits and Instruments (4)

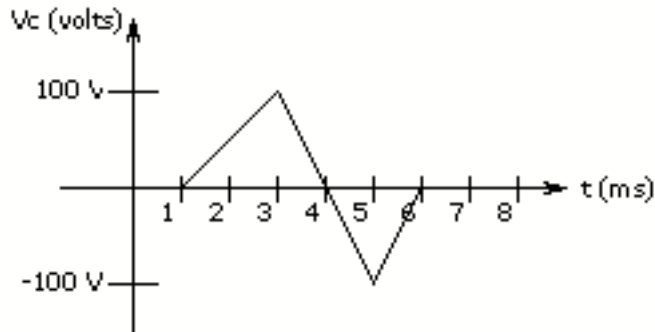
Quiz No. 10

4/2/04

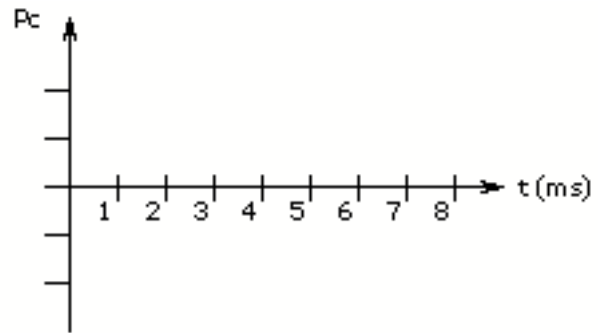
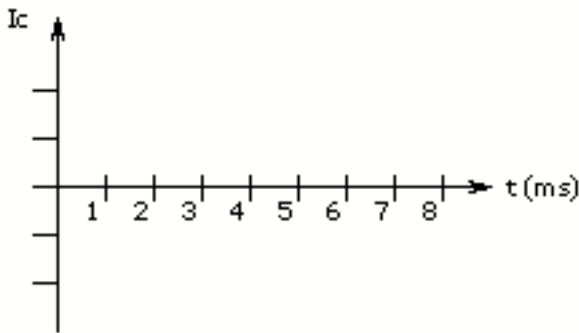
PUT ANSWERS IN THE SPACE PROVIDED AND, IF APPROPRIATE, SHOW YOUR WORK. BE SURE TO STATE ANY ASSUMPTIONS

Problem 1 Power and Energy in Inductors/Capacitors (10 points)

The figure below shows the voltage across a $0.1\mu\text{F}$ capacitor.

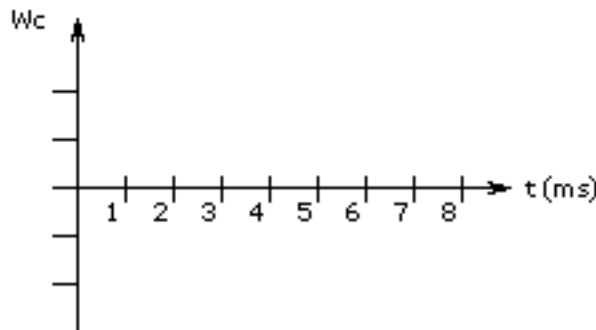


(a) Sketch the current, power and energy as a function of time.



Be sure to indicate the minimum/maximum values of these waveforms.

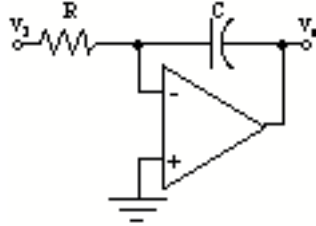
(b) Indicate on your sketch of power as a function of time when the capacitor is absorbing power, and when it is providing (delivering) power.



Name : _____ Section: _____ CWRU e-mail: _____

Problem 2 OP AMP integrator/differentiator (10 points)

Consider the OP AMP circuit shown below. There is no energy initially stored in the capacitor. A voltage of 6 volts is applied at $t=0$. The OP AMP is powered from a ± 15 volt power supply.



(a) If $R=10\text{k}\Omega$ and $C=0.25\mu\text{F}$ determine the output voltage as a function of time.

(b) When will the output voltage reach saturation?