

# ECE 109L - EQUIVALENT CIRCUITS - LAB 21

## THEVENIN'S THEOREM - PART IV

FALL 2006

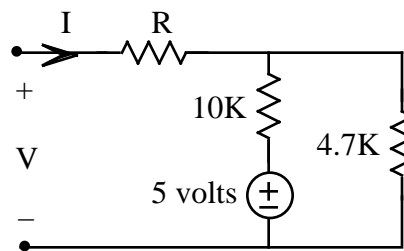
A.P. FELZER

### OBJECTIVE

The objective of this Lab is to demonstrate that  $R_{TH}$  can be calculated from measurements taken without setting the sources to zero.

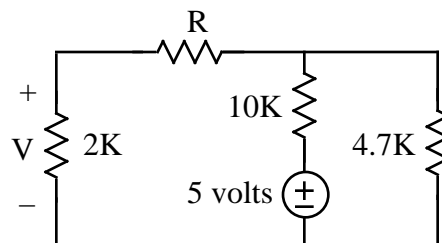
### LAB

1. **PreLab** - Use Mathcad to plot 3 cycles of  $x(t) = 4\cos(2 \cdot 4000t)$
2. Given the following resistor circuit

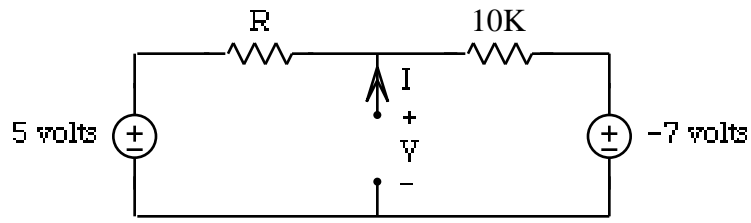


PARTNER 1:  $R = 2K$     PARTNER 2:  $R = 4.7K$

- a. Measure your resistor values. Compare with nominal values
- b. Take measurements for calculating  $R_{TH}$  without setting the 5 volt source to zero. Draw corresponding circuits
- c. Make use of your measurements in part (b) to calculate  $R_{TH}$
- d. Now measure  $R_{TH}$  with the 5 volt source set to zero
- e. Compare your measured and calculated values of  $R_{TH}$
- f. Draw your circuit's Thevenin Equivalent circuit
- g. Use your Thevenin Equivalent circuit from part (f) to calculate V when a 2K resistor is connected to the terminals as follows



- h. Measure V for your circuit in part (g)
  - i. Compare your measured and calculated values of V
2. Repeat Problem (1) for the following circuit



PARTNER 1:  $R = 4.7K$     PARTNER 2:  $R = 10K$