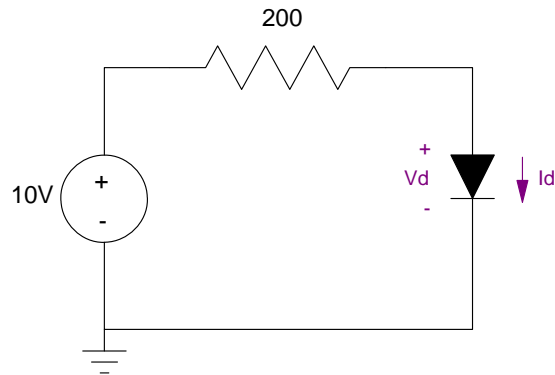# ECE 320 - Homework #3

pn junction, Diode VI characteristics, Ideal Diodes. Due Monday January 30th, 2017

Problem 1-2) Use the following circuit:
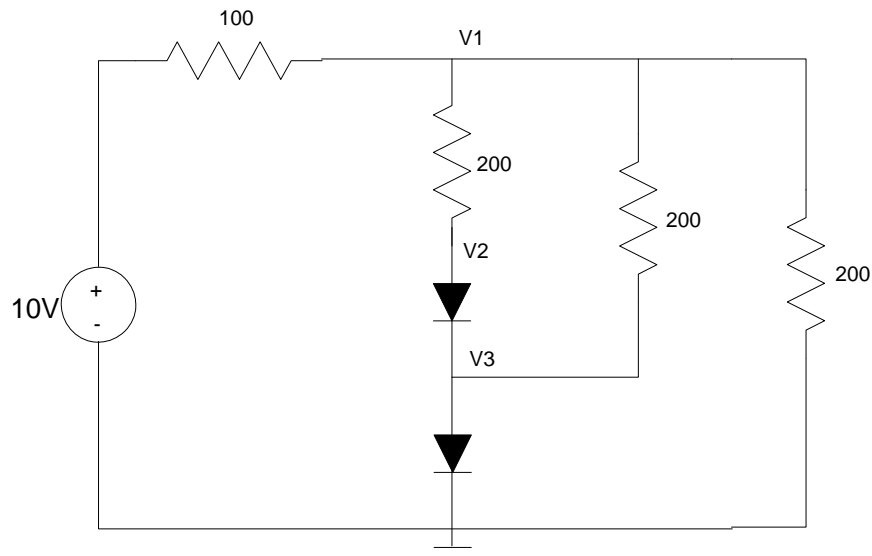

1) Determine the voltage and current through the diode for the following circuit assuming

$$V_d = 0.052 \ln (10^7 I_d + 1)$$

2) Determine the voltages and current through the diode assuming an ideal diode model with

Vf = 0.7V

Problem 3-6) Use the following circuit:

3a) Write the voltage node equations for this circuit assuming

$$V_d = 0.052 \ln (10^7 I_d + 1)$$

$$I_d = 10^{-7} \left(\exp \left(\frac{V_d}{0.025} \right) - 1 \right)$$

3b) Solve these nonlinear equations for V1, V2, and V3 (hint: use fminsearch in Matlab)

4) Determine the voltages and current through the diode assuming an ideal diode model with

$Vf = 0.7V$

$Vin = +10V$

5) Solve for the voltages and currents using PartSim.

6) In lab, build this circuit using silicon diodes. Measure the voltages and compute the currents