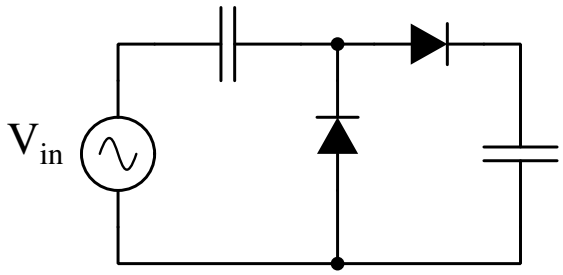
Indian Institute of Technology, Delhi
ELL304 Analog Circuits
Tutorial 1, 30 July 2015

1. Consider a non-ideal diode with the standard equation. i_D is 1 mA. If v_D changes by 1 mV, what will be the change in i_D.

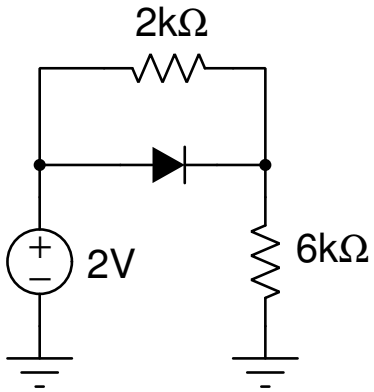
2. Two unequal diodes are placed in series with each other. Find the i_D to v_D relationship where i_D is the current through the series combination of the two diodes, v_D is the total voltage across this series combination. The reverse saturation currents of the two diodes are I_{0_1} and I_{0_2}.

3. Design a full wave rectifier to deliver an average power of 2 Watts to a cellphone, with a voltage of 3.6 V and a maximum ripple of 0.2 Volts.

4. Analyze the circuit below and deduce the output waveform. Assume an approximate model for the diodes with a cut-in voltage of 0 V.



5. Analyze the circuit below and deduce the current through the 6 kΩ resistor. Assume an approximate model for the diode with a cut-in voltage of 0.7 V.



Further problems are at the end of Chapter 3 of "Fundamentals of Microelectronics" by Razavi.