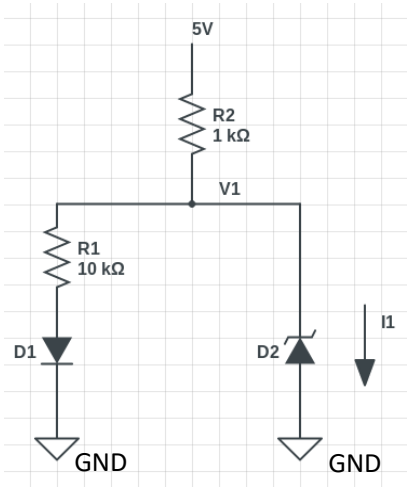
ECE 65 – HW#1 No submission is required

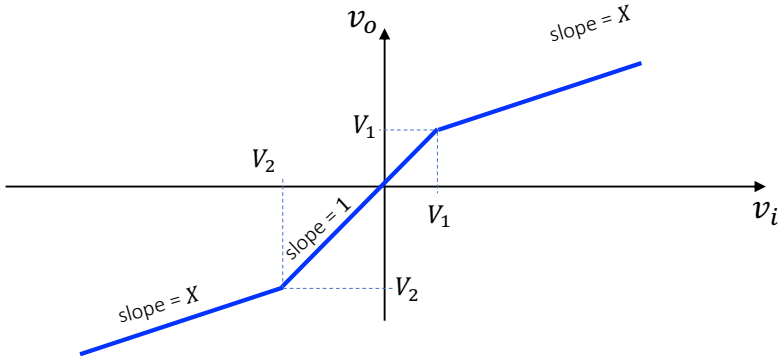
Problem 1.

In the following circuit find V1 and I1. ($V_Z = 3\ V$ and $V_{D0} = 0.7\ V$)



Problem 2.

Design a diode waveform shaping circuit that would have the below transfer function. Assume $X = 0.5, V_1 = 1,$ and $V_2 = -2$.



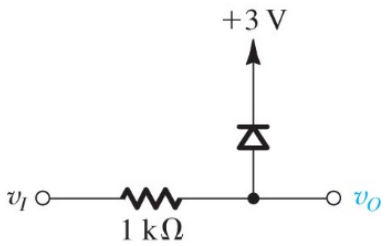
Problem 3.

The circuits (a) and (b) shown below are connected as follows:

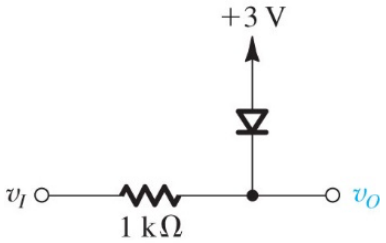
The two input terminals are tied together, and the two output terminals are tied together.

a) Find, sketch and label the transfer function. (Assume $V_{D0} = 0.7\ V$).
b) Draw the output voltage waveform if $v_i(t) = 5\ \sin(\omega t)$. There is no need for labeling the time axis.

Show your work.



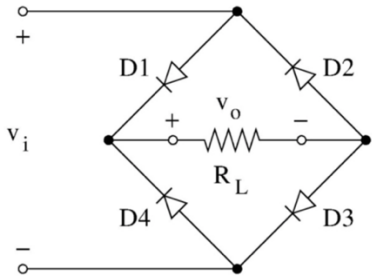
(a)



(b)

Problem 4.

Plot the transfer function of the following full-wave rectifier. Find v_o for different ranges of v_i and plot a graph that shows the relationship between v_i and v_o.



Problem 5.

In the circuit below, $v_i(t) = 10\sin(\omega t)$ where $\omega = 1000\ rad/s$, Assume $V_{D0} = 0.7\ V$ and $v_o(0) = 0\ V$. Calculate and plot $v_o(t)$ for $0 \leq t \leq 5\ ms$.