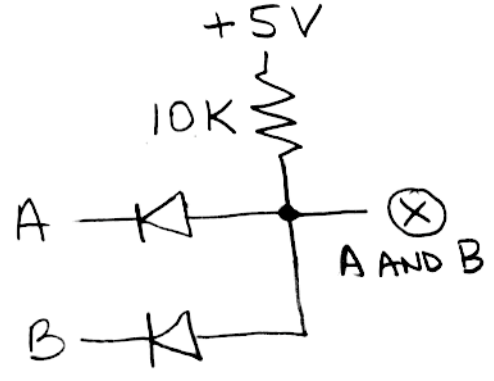
BioE 1310 - Homework 7

(1) The primary of a transformer sees 120 $V_{AC\ Rms}$ and has 300 turns of wire. The secondary has 50 turns. What is the peak AC voltage across the secondary? _____ answer

(2) The "truth table" and diode circuit for an AND gate are shown below.

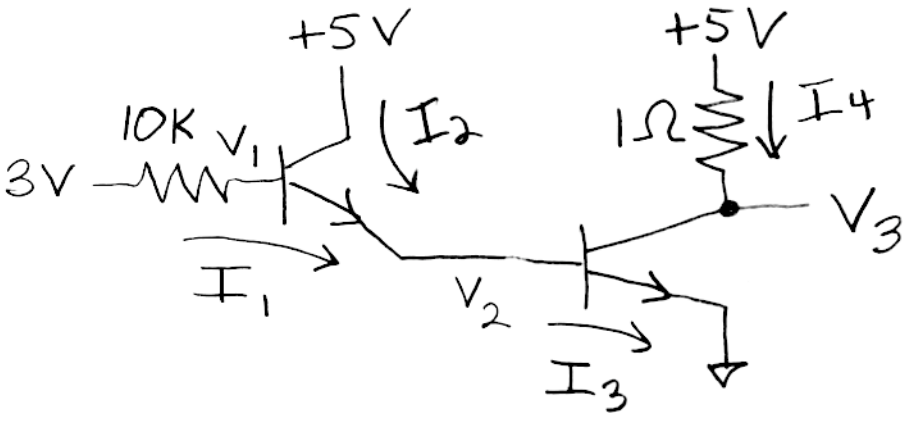
A	B	A AND B	VOLTAGE AT ⊗
0	0	0	___
0	1	0	___
1	0	0	___
1	1	1	___

Fill in answers



Assuming "1" means +5V and "0" means 0V, and assuming a 0.5V forward bias voltage drop across the diodes, fill in the voltage you would see at ⊗ for all four states

(3) assuming a 0.5 V forward bias voltage drop across B-E junctions, and $\beta = 100$, solve for the indicated voltages and currents



V_2 ____

V_1 ____

I_1 ____

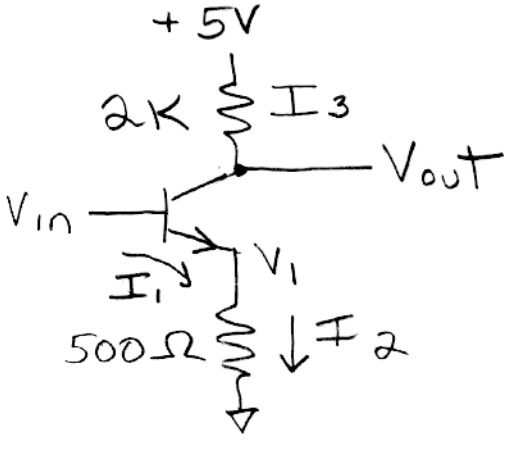
I_2 ____

I_3 ____

I_4 ____

V_3 ____

(4) Do the same as in (3) for this circuit when $V_{in} = 1.0V$ & when $V_{in} = 1.1V$. What is the AC gain, $\frac{\Delta V_{out}}{\Delta V_{in}}$? ____ ← AC gain



$V_{in} = 1.0V$	$V_{in} = 1.1V$
V_1 ____	V_1 ____
I_2 ____	I_2 ____
I_1 ____	I_1 ____
I_3 ____	I_3 ____
V_{out} ____	V_{out} ____