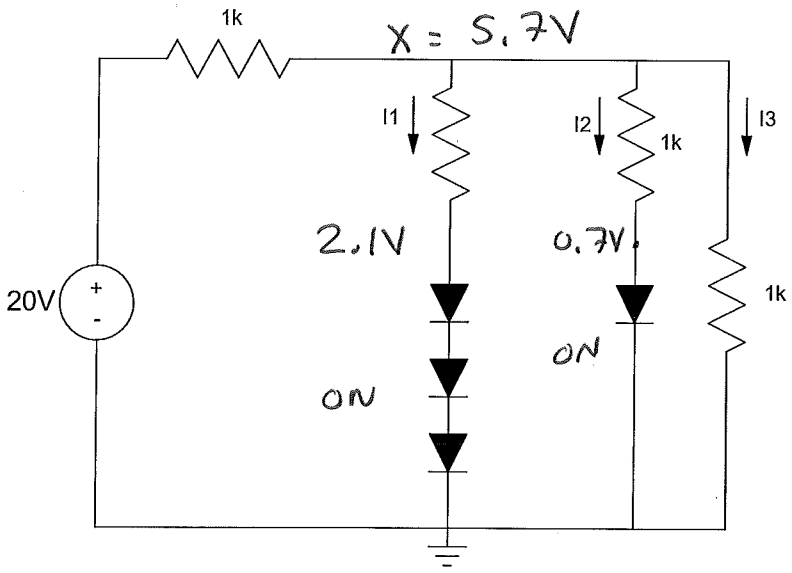
ECE 320 - Quiz #3 - Name _____

Ideal Diode, Light Emitting Diodes. September 17, 2015

1) Assume ideal silicon diodes (Vf = 0.7V). Determine the currents I1, I2, and I3

I1	I2	I3
3.6mA	5mA	5.7mA



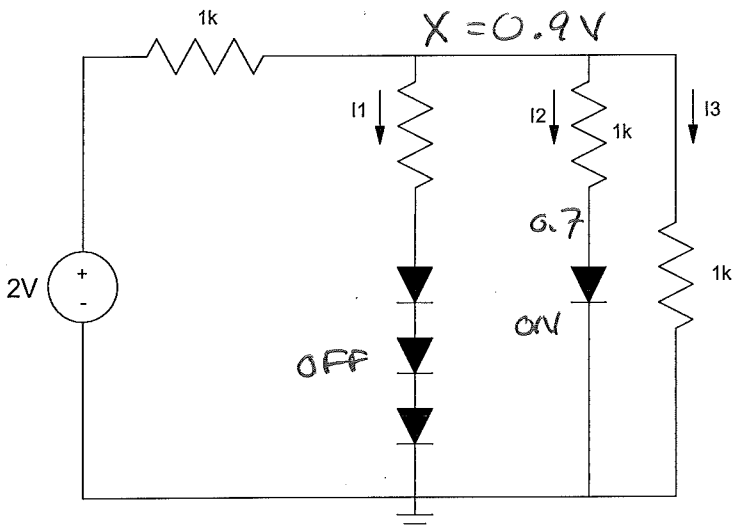
$$\frac{X-20}{1k} + \frac{X-2.1}{1k} + \frac{X-0.7}{1k} + \frac{X}{1k} = 0$$

$$4X = 22.8$$

$$X = 5.7V$$

2) Assume ideal silicon diodes (Vf = 0.7V). Determine the currents I1, I2, and I3

I1	I2	I3
0	0.2mA	0.9mA



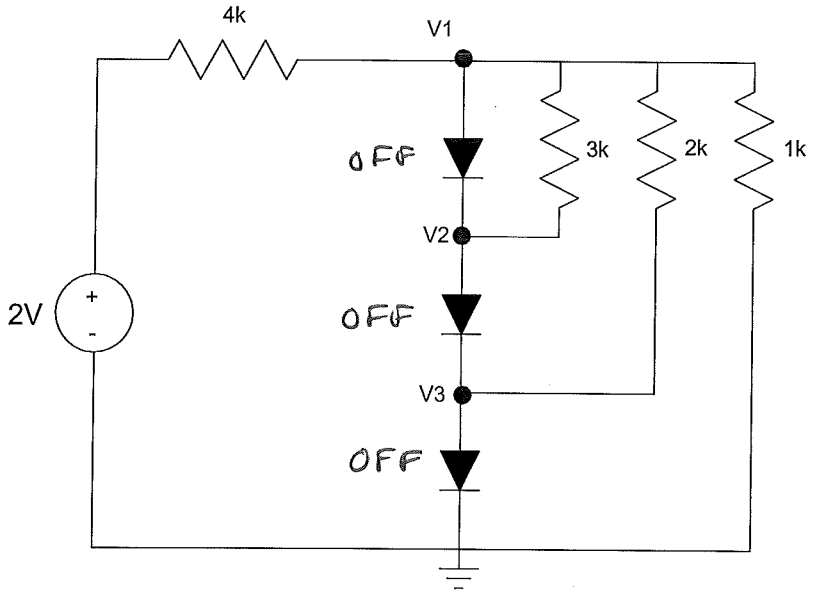
$$\frac{X-2}{1k} + \frac{X-.7}{1k} + \frac{X}{1k} = 0$$

$$3X = 2.7$$

$$X = 0.9V$$

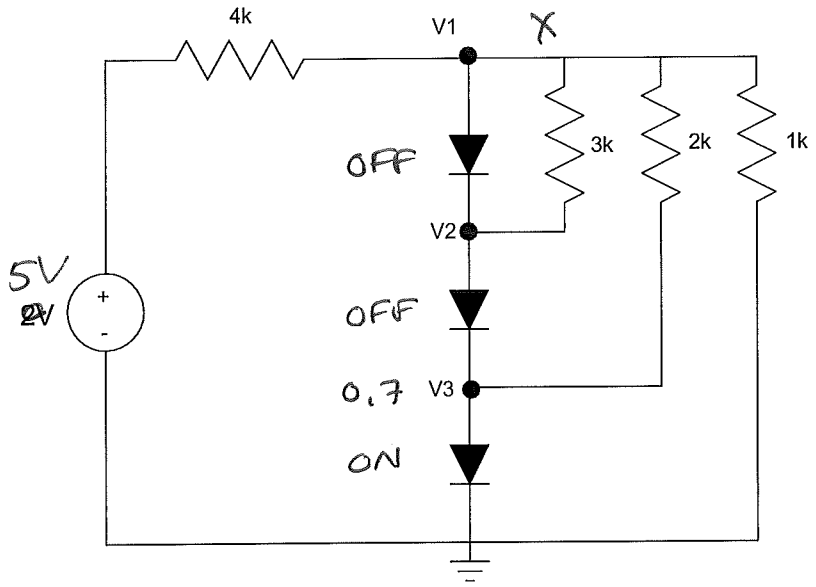
3) Assume ideal silicon diodes (Vf = 0.7V). Determine the voltages V1, V2, and V3

V1	V2	V3
0.5V	0.5V	0.5V



4) Assume ideal silicon diodes (Vf = 0.7V). Determine the voltages V1, V2, and V3

V1	V2	V3
0.9143 V	0.9143V	0.7V



$$\frac{X-5}{4K} + \frac{X-0.7}{2K} + \frac{X}{1K} = 0$$

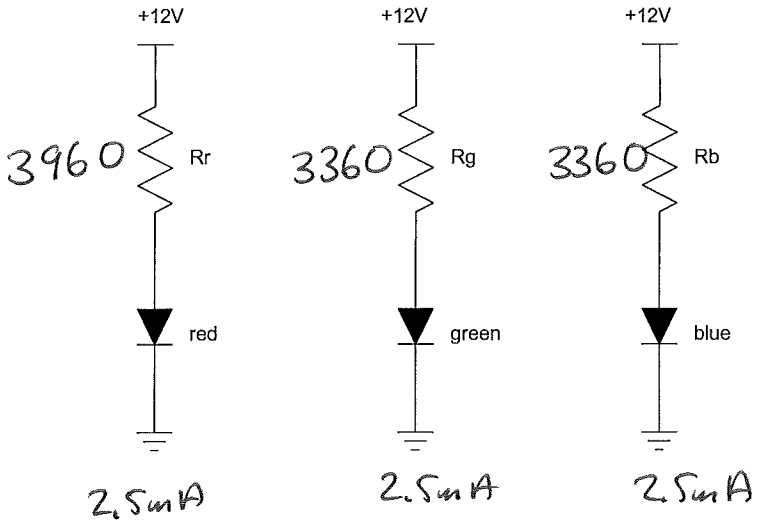
$$1.75X = 1.6$$

$$X = .9143$$

5) Assume ideal diodes with the following specifications:

	red	green	blue
Peak forward current	100mA	100mA	100mA
Vf @ 20mA	2.1V	3.6V	3.6V
mcd @ 20mA	8,000	8,000	8,000
dominant wavelength	630nm	520nm	470nm

Find Rr, Rg, and Rb so that each LED outputs 1,000 mcd.



$R_r = \frac{12 - 2.1}{2.5mA} = 3960$ $\quad R_b = \frac{12 - 3.6}{2.5mA} = 3360$

$R_g = \frac{12 - 3.6}{2.5mA} = 3360$

Bonus! Cullen Murphy, author of "Are We Rome?" was on the Colbert Show in 2007. Colbert's final question was "Unites States vs. Rome. Who would win?" What was Cullem Murphy's answer:

a) United States: We have nuclear weapons
b) United States: Our military-industrial complex is of a scale that Rome could not match.
c) Tie: Neither government works all that well.
d) Rome: Rome had no scruples and would stop at nothing.
e) Rome: Rome could take massive casulties and would never give up.