ECE 320 - Homework #3

Ideal Diodes, LEDs, AC to DC Converters. Due Monday, January 31st Please submit as a hard copy or submit on BlackBoard

Ideal Diodes:

1) Assume ideal silicon diodes (Vf = 0.7V). Determine the voltages and currents for the following circuit



2) Assume ideal silicon diodes (Vf = 0.7V). Determine the voltages and currents for the following circuit
R1, R2, R3 are the same that you used in homework #2



LEDs

The specifications for a Piranah RGB LED are

Color	Vf @ 20mA	mcd @ 20mA
red	2.0V	10,000
green	3.2V	10,000
blue	3.2V	10,000

3) Design a circuit to drive these LEDs with a 5V source to produce olive green:

- Red = $6901 \mod (176/255)$
- Green = $7686 \mod (196/255)$
- Blue = $2313 \mod (59/255)$

4) Design a circuit to drive these LEDs with a 5V source producing salmon pink:

- Red = $6666 \mod (170/255)$
- Green = 3333 mcd (85/255)
- Blue = $5490 \mod (140/255)$

Other colors can be obtained from

https://www.rapidtables.com/web/color/color-wheel.html

AC to DC Converters

For the circuit below:

- 5) Determine the votlages at V1 and V2 (DC and AC)
- 6) Build the circuit in CircuitLab (or similar program) and verify your calculations for problem #5
- 7) Determine C1 and C2 so that AC voltages are: V1 = 2Vpp and V2 = 250mVpp.
- 8) Build this circuit in CircuitLab (or similar program) and verify your calculations for problem #7



Circuit for problems 5 - 8