

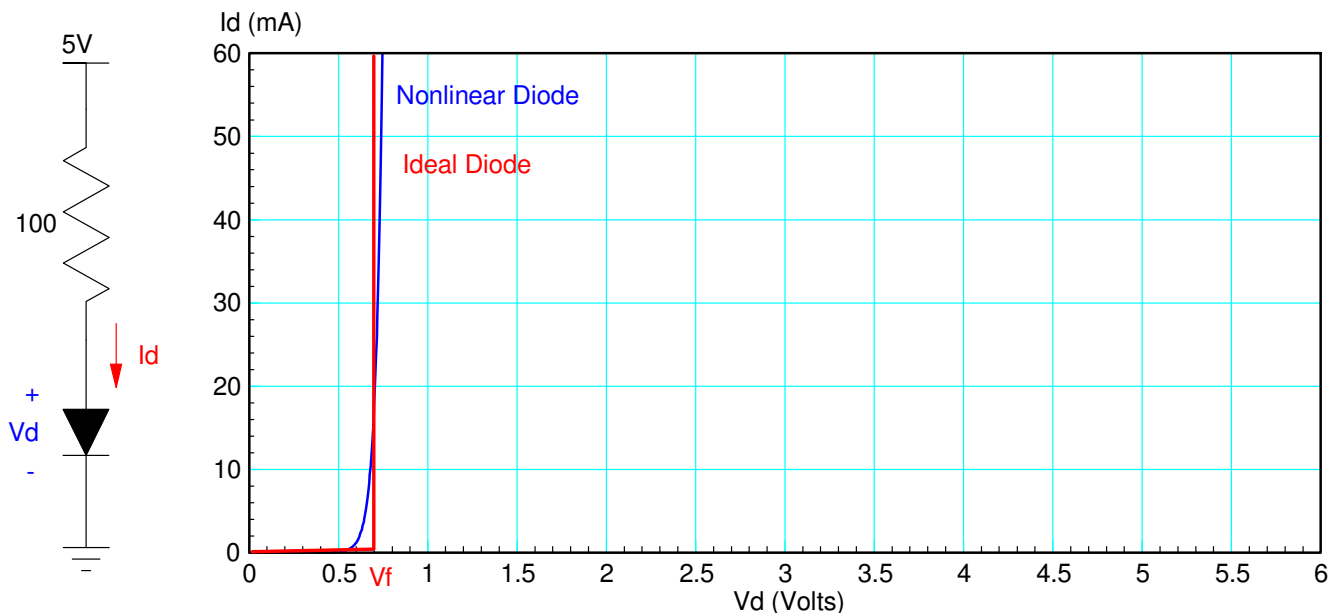
ECE 320 - Homework #3

Ideal Diodes, LEDs, AC to DC Converters. Due Monday, January 31st

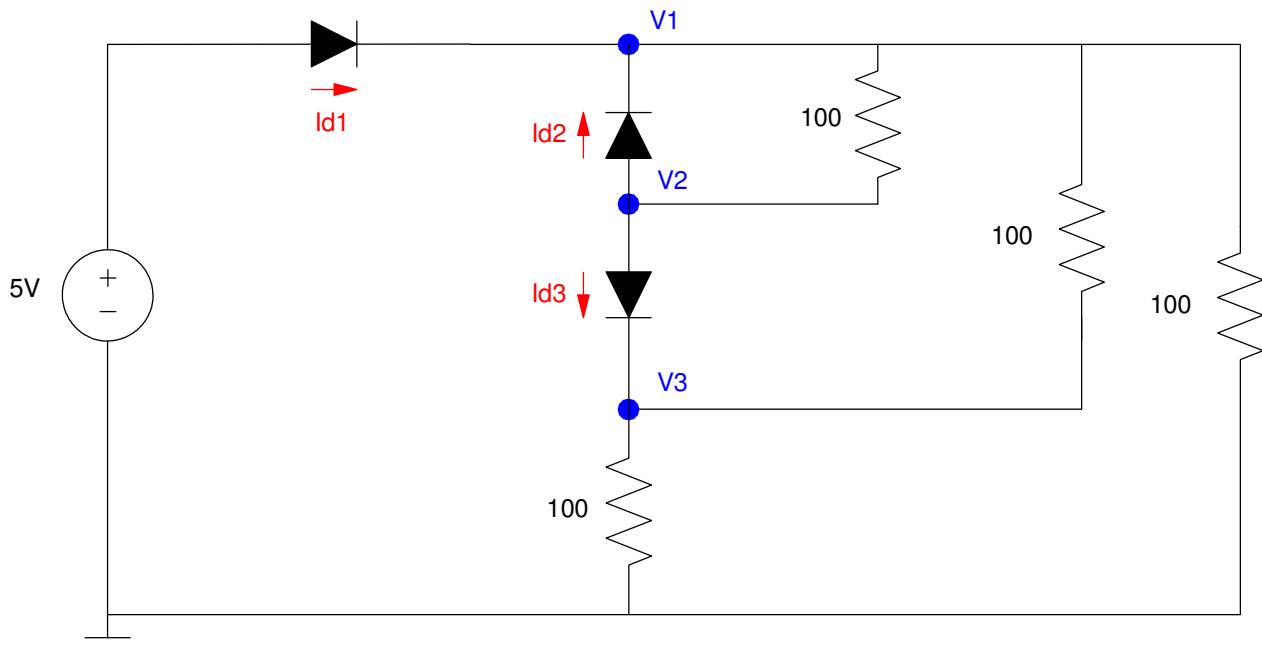
Please make the subject "ECE 320 HW#3" if submitting homework electronically to Jacob_Glower@yahoo.com (or on blackboard)

Ideal Diodes:

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



2) Assume ideal silicon diodes ($V_f = 0.7V$). Determine the voltages and currents for the following circuit



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

1) Design a circuit to drive these LEDs with a 5V source to produce Sky Blue:

- Red = 7411 mcd (189/255)
- Green = 10,000 mcd (255/255)
- Blue = 9490 mcd (242/255)

2) Design a circuit to drive these LEDs with a 5V source producing Olive Green:

- Red = 4862 mcd (124/255)
- Green = 6431 mcd (164/255)
- Blue = 4745 mcd (121/255)

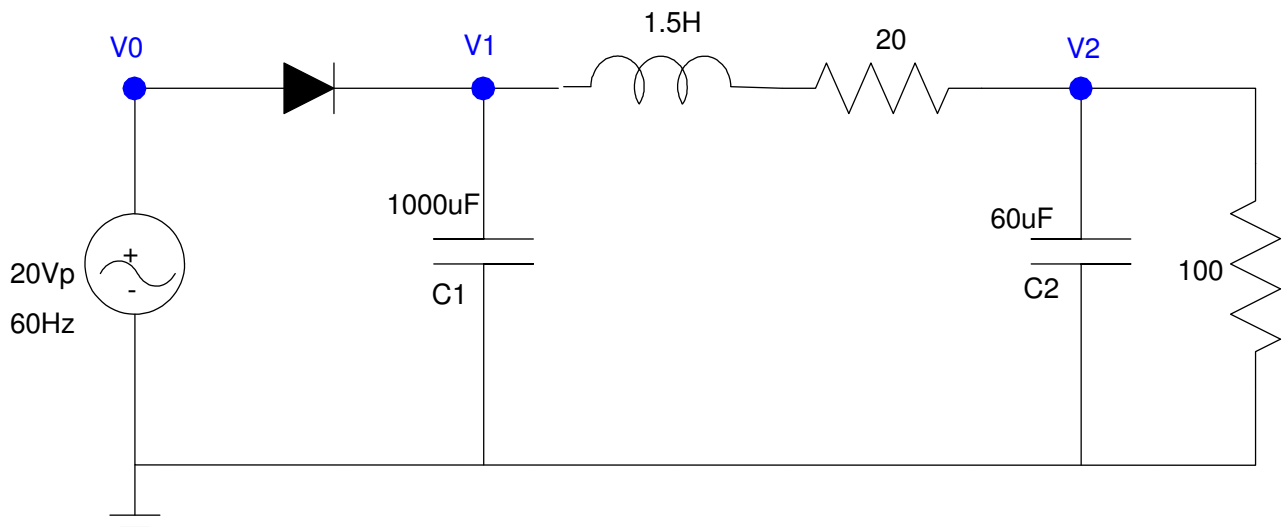
Other colors can be obtained from

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

AC to DC Converters

For the circuit below:

- 5) Determine the voltages 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