ECE 320 - Homework #4

LEDs, Clipper Circuits, Max/Min Circuits. Due Monday February 6th, 2017

1) An RGB Led has the following characteristics:

- Red: Vf = 2.2V @ 20mA, 8000mcd @ 20mA
- Green: Vf = 3.2V @ 20mA, 8000mcd @ 20mA
- Blue: Vf = 3.2V @ 20mA, 8000mcd @ 20mA

Design a circuit to output orange light

- Red = 31% (of 20mA)
- Green = 100% (of 20mA)
- Blue = 50% (of 20mA)

2) A white 3W led has the following characteristics:

- Vf = 3.5V @ 700mA
- 270 Lumens @ 700mA

Design a circuit to drive this LED at 700mA. Assume you have a 10VDC power supply available.

Problem 3-10) Design a clipper or max/min circuit.

3) Requirements: Specify what your circuit does

- Inputs: Voltages, Currents
- Outputs: Voltages, Currents, (or resistance)
- Relationship: How the input relates to the outputs.
- Tolerances: How close is close enough.

4) Analysis: Design a circuit to meet your requirements.

- Give calculations for resistors, voltates, and currents.
- Note that if something is arbitrary, you're missing something in the requirements.

5) Test: Check your analysis with PartSim (or similar program)

6) Validation: Build your circuit and collect data in lab to see if your analysis is correct and if you meet your requirements.