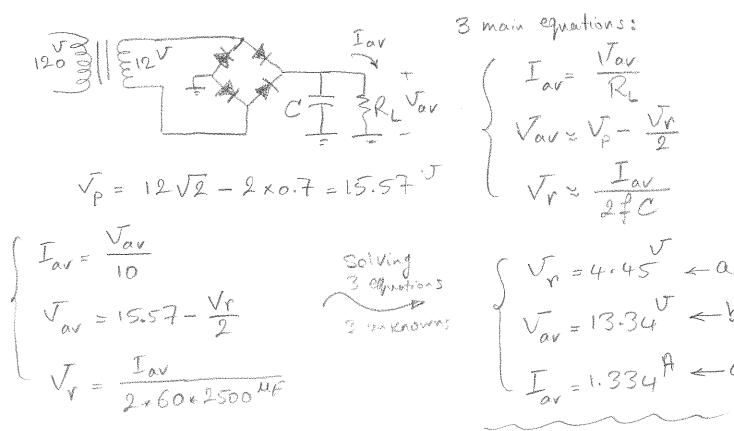


## University of New Mexico Department of Electrical and Computer Engineering

## ECE 321L - Electronics I

## Homework #4

- 1. A full wave rectifier using a diode bridge and a 120V/12V transformer is designed to deliver power to a  $10\Omega$  load. Assume all diodes have Von=0.7V and negligible off current.
  - a. What is the ripple voltage, if the capacitance of the filter is 2500µF?
  - **b.** Considering the ripple calculated in part a, what is the average DC voltage of the output (hint: it will be approximately Vp-Vr/2)?
  - **c.** Considering the average DC voltage of the output found in part b, determine the average current and power in the load resistor.



- Design a full wave rectifier for a regulator that delivers 100W electrical power to a white off-the-shelf LED (<a href="http://www.semileds.com/system/files/C4246-100-1010-CE.pdf">http://www.semileds.com/system/files/C4246-100-1010-CE.pdf</a>). Per datasheet, the LED requires 33V and draws 3A current. You are required to limit the ripple voltage to less than 20% of average DC voltage of the output. Assume all diodes have Von=0.7V and negligible off current.
  - a. Draw the circuit diagram.
  - b. Determine the voltage of transformer and capacitance of the filter.

