## EE 2212 QUIZ 3 S. G. Burns

 **13 October 2021**

**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Design  a +40 volt dc  power supply for your sound system.  Your sound system requires  a 400 watt capability.  The power supply is energized from a three-wire 110 Vrms  60 Hz power line that meets the National Electric Code (NEC).   The system  block diagram and design specifications  are given below.**



**DESIGN SPECIFICATIONS**

* **Input is a 110 Vrms  60 Hz**
* **Output voltage is 40 volts**
* **Maximum allowable ripple is 2%**
* **Use a full-wave bridge rectifier**
* **Use a transformer**
* **Assume diodes with VF = 0.7  volts**

**YOUR DESIGN MUST INCLUDE:**

**Well-labeled circuit diagram of what goes in the “Your Design” box.  There should be enough detail such that someone could build an operational  prototype.  Polarities of key components as are the diode orientations are important**

**Key design equations and supporting calculations.  Show your work!**

**Component specifications including:**

* **Transformer-turns ratio**
* **Effective value of the audio system load resistor (speaker impedance)  and load current for a 400 watt, 40 volt system.**
* **Capacitor value  to satisfy the 2%  ripple voltage specification.**
* **Bridge rectifier, correctly oriented, with diode-current and power ratings.**
* **Correctly located primary circuit fuse and its rating.**
* **Correct (NEC specified safe wiring) to the three wire  power line receptacle. Be sure you show the fuse location.**