

### Physics 517/617 Experiment 3 Diodes and Rectifiers

#### *Basic Experiment - Physics 517/617*

- 1) Measure and graph the forward and reverse characteristics of a diode. Use a DC power supply, resistor(s) and multimeters. The current in the diode should not exceed 300 mA.
- 2) Build a clipping circuit that limits the voltage swing from -6 to 5.6 Volts. Use a 1 K $\Omega$  input resistor. Derive the 5 volt reference from a 5 volt source. Apply a 1 KHz sine wave. Vary the amplitude of the input voltage and sketch the input and output waveforms. What happens when one applies a triangular wave ?
- 3) Build a full wave rectifier. Plot the output voltage vs. input voltage. Make a modification so that the output voltage approximates D.C.. Use a transformer to couple the input voltage to your circuit. What is the ripple factor both measured and expected for your circuit ?
- 4) Build a Cockroft-Walton voltage quadrupler (Simpson pg. 194). Measure the output of the circuit. What effect does applying various resistor loads have on the output of the circuit ? What is the limiting voltage one can obtain using this technique ?