

Physics 230: Problem Set #3

SPRING, 2006

Department of Physics and Astronomy
Sonoma State University

Due March 2, 2006, 1:00 pm (in class)

- Text: Nigel P. Cook, Electronics: A Complete Course, Prentice Hall, 2nd Edition, 2004;
 - Please read chapter 6, 7-1, 7-2, 10, and 11;
1. What would be the voltage drop across each of the resistors in Figure 10-18 on page 369?
 2. Refer to Figure 11-51 on page 421. If a 120 V rms AC ($f = 60$ Hz) input is applied to the 19:1 step-down transformer, what would be the peak secondary output voltage?
 3. Calculate the average output voltage of the bridge rectifier circuit shown in Figure 11-53 on page 421, taking into account the silicon diode voltage drop.
 4. The barrier potential of a silicon diode is known to decrease by 2 mV for each degree Celsius rise, i.e., $\frac{\Delta V}{\Delta T} = -2 \text{ mV}/^\circ\text{C}$. What is the barrier potential of a silicon diode when the junction temperature is 150°C ?
 5. Refer to Fig. 1. Calculate the load current, load voltage, load power, silicon diode power, and total power.

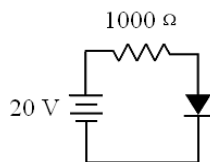


FIG. 1: A diode connected in series to a resistor.