

**Phy114: Electromagnetism, Waves and Radiation
for the Sports Science
Homework Problems
Set #6: Due Monday, March 24, 2008**

Note: Students are encouraged to work together and discuss the problems. However, each student must arrive at her/his own final answers. Show all your work. Simply copied homework will result in zero.

1. (10 points) A microwave oven operates on 120-V electricity and draws 7.5 A of current. (a) Calculate the effective power. (b) Calculate the peak power consumed by the oven.
2. (10 points) (a) What is the resistance of five 60-W light bulbs connected in series? (b) in parallel? The resistance of a 60-W 120-V light bulb is $240\ \Omega$.
3. (10 points) (a) Calculate the currents used by and resistances of 100- and 300-W light bulbs designed to operate on 120-V electricity. (b) If these two bulbs are connected in series to a 120-V source, what power is consumed by each, assuming that their resistances are the same found in (a)?
4. (10 points) How many 150-W light bulbs can be operated at a brightly lit clothing store on a 120-V circuit protected by a 30-A fuse?
5. (10 points) A 120-V radiant heater has two heating elements. (a) What resistance should the elements have so that one consumes 2.0 kW and the other 1.5 kW? (b) What are the five possible power consumptions of this heater?

6. (20 points) In the right figure three resistors are connected to a battery as shown. (a) What is the total resistance of the circuit? (b) What is the current flowing through $400\ \Omega$ resistor? (c) What is the current flowing through the $1600\ \Omega$ resistor? (d) What is the voltage drop from the point b to c ?



