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) Military aircraft use 400-Hz AC power because it is possible to design lighter-weight equipment using this frequency. (a) What time is required for one complete cycle of this AC power? (b) What is the effective voltage if the peak voltage is 250 V? (c) If a radar on board operates on this electricity and draws 8.0 A of current, calculate the effective power. (d) Also, calculate the peak power consumed by the radar.

2. (10 points) (a) What is the resistance of five 160-W light bulbs connected in series? (b) in parallel? The resistance of a 160-W 120-V light bulb is 90 Ω.

3. (10 points) (a) Calculate the currents used by and resistances of 60- and 150-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 200-W light bulbs can be operated at a brightly lit clothing store on a 120-V circuit protected by a 50-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 500 W and the other 1.0 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 Ω resistor? (c) What is the current flowing through the 1600 Ω resistor? (d) What is the voltage drop from the point b to c?