Name _____ Date _____ Class _____

5 ELECTRONS IN ATOMS

Practice Problems

In your notebook, solve the following problems.

SECTION 5.1 MODELS OF THE ATOM

1. How many sublevels are in the following principal energy levels?

a. $n = 1$ **c.** $n = 3$ **e.** $n = 5$

b. $n = 2$ **d.** $n = 4$ **f.** $n = 6$

2. How many orbitals are in the following sublevels?

a. 1*s* sublevel **d.** 4*f* sublevel **g.** fifth principal energy level

b. 5*s* sublevel **e.** 7*s* sublevel **h.** 6*d* sublevel

c. 4*d* sublevel **f.** 3*p* sublevel

3. What are the types of sublevels and number of orbitals in the following energy levels?

a. $n = 1$ **c.** $n = 3$ **e.** $n = 5$

b. $n = 2$ **d.** $n = 4$

SECTION 5.2 ELECTRON ARRANGEMENT IN ATOMS

1. Write a complete electron configuration of each atom.

a. hydrogen **d.** barium **g.** krypton

b. vanadium **e.** bromine **h.** arsenic

c. magnesium **f.** sulfur **i.** radon

SECTION 5.3 PHYSICS AND THE QUANTUM MECHANICAL MODEL

1. What is the wavelength of the radiation whose frequency is $5.00 \times 10^{15}\ s^{-1}$? In what region of the electromagnetic spectrum is this radiation?

2. An inexpensive laser that is available to the public emits light that has a wavelength of 670 nm. What are the color and frequency of the radiation?

3. What is the energy of a photon whose frequency is $2.22 \times 10^{14}\ s^{-1}$?

4. What is the frequency of a photon whose energy is 6.00×10^{-15} J?

5. Arrange the following types of electromagnetic radiation in order of increasing frequency.

a. infrared **c.** visible light **e.** microwaves

b. gamma rays **d.** radio waves **f.** ultraviolet

6. Suppose that your favorite AM radio station broadcasts at a frequency of 1600 kHz. What is the wavelength in meters of the radiation from the station?