

## 5

## ELECTRONS IN ATOMS

## Practice Problems

In your notebook, solve the following problems.

## SECTION 5.1 MODELS OF THE ATOM

- 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. $n = 6$
- How many orbitals are in the following sublevels?
 

a. $1s$ sublevel	d. $4f$ sublevel	g. fifth principal energy level
b. $5s$ sublevel	e. $7s$ sublevel	h. $6d$ sublevel
c. $4d$ sublevel	f. $3p$ sublevel	
- 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

- 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

- What is the wavelength of the radiation whose frequency is  $5.00 \times 10^{15} \text{ s}^{-1}$ ?  
In what region of the electromagnetic spectrum is this radiation?
- 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?
- What is the energy of a photon whose frequency is  $2.22 \times 10^{14} \text{ s}^{-1}$ ?
- What is the frequency of a photon whose energy is  $6.00 \times 10^{-15} \text{ J}$ ?
- 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
- 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?