Unit 2 Review

Name_____

SECTION 4.3 DISTINGUISHING BETWEEN ATOMS

1. How many protons are found in an atom of each of the following?
   a. boron
   c. neon
   b. sulfur
   d. lithium

2. Complete the table for the following elements.

Element	Number of Protons	Number of Electrons	Number of Neutrons	Atomic Number	Mass Number
Manganese	25		30		
Sodium		11	12		
Bromine	35		45		
Yttrium				39	89
Arsenic		33			75
Actinium					227

3. How many neutrons are in each atom?
   a. $_{11}^{23}Na$
   c. $_{35}^{81}Br$
   b. $_{92}^{238}U$
   d. $_{9}^{19}F$

4. The two most abundant isotopes of carbon are carbon-12 (mass = 12.00 amu) and carbon-13 (mass = 13.00 amu). Their relative abundances are 98.9% and 1.10%, respectively. Calculate the atomic mass of carbon.

5. How many electrons do the following ions have?
   a) Pb^{2+}
   b) N^{3-}
   c) Th^{6+}

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

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

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

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 5.00×10^{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 2.22×10^{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. cosmic 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?