

### Che 111: Chapter 11 Practice Problems

1. Each electron seems to have a dual nature in which both \_\_\_\_\_ and \_\_\_\_\_ characteristics are apparent.
2. All of the orbitals that have the same potential energy for a hydrogen atom are said to be in the same \_\_\_\_\_ energy level.
3. Each s sublevel has one orbital, each p sublevel has three orbitals, each d sublevel has \_\_\_\_\_ orbitals, and each f sublevel has \_\_\_\_\_ orbitals.
4. What is the maximum number of electrons that can be placed in a  
5s sublevel?  
5f sublevel?
5. Write the complete **electron configuration** and **orbital diagram** for each of the following:
  - a. oxygen, O
  - b. sulfur, S
  - c. manganese, Mn

d. tellurium, Te

e. radon, Rn

6. Write the abbreviated electron configurations for each of the following.

a. chlorine, Cl

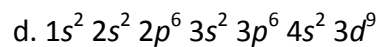
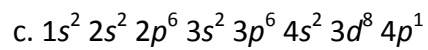
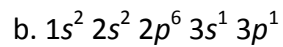
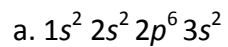
b. boron, B

c. scandium, Sc

d. yttrium, Y

e. astatine, At

7. Would the following electron configurations represent ground states or excited states?



8. What is the first element on the periodic table to have

a. an electron in the  $5s$  sublevel?

b. a filled  $4d$  sublevel?

c. a half-filled  $6p$  sublevel?