1. Define **ionic bond** and **covalent bond**.

2. What types of elements form ionic bonds and covalent bonds?

3. Define **electronegativity**.

4. For each of the following pairs of elements, indicate the one with the highest electronegativity:
   (a) Na, Al  
   (b) O, Se

5. Define **nonpolar covalent bond** and **polar covalent bond**.

6. On the basis of electronegativities given in Figure 11.3, indicate whether each of the following bonds would be expected to be nonpolar covalent, polar covalent, or ionic:
   (a) N-N  
   (b) N-O  
   (c) N-Cl  
   (d) N-Na

7. For each of the following polar covalent bonds, indicate which end of the bond is the negative end:
   (a) H-Cl  
   (b) C-O  
   (c) Br-F

8. In virtually every stable compound, each of the atoms achieves an electron arrangement analogous to what group of atoms? What is this electron arrangement called?

9. Draw the Lewis Structure for each of the following ionic compounds:
   (a) BaS  
   (b) MgCl$_2$  
   (c) Cs$_2$O  
   (d) Al$_2$S$_3$

10. For each of the following pairs of atoms or ions, indicate the one that is the smallest:
    (a) Fe or Fe$^{3+}$  
    (b) Cl or Cl$^-$  
    (c) Na$^+$ or P$^{3-}$  
    (d) As$^{3-}$ or Rb$^+$

11. Draw the Lewis Structure for each of the following covalent compounds or polyatomic ions. For molecules or polyatomic ions that exhibit resonance, draw each of their resonance structures:
    (a) PH$_3$  
    (b) SCl$_2$  
    (c) HBr  
    (d) SiF$_4$  
    (e) CO  
    (f) CSe$_2$  
    (g) SO$_3$  
    (h) NO$_2^-$

12. Give the shapes of each of the molecules or polyatomic ions in question 11.

13. Give the polarity of each of the molecules or polyatomic ions in question 11.