Bonding Unit Review

Name: KEY

1. What is a covalent bond? What is an ionic bond?
   - covalent bond involves the sharing of electrons
   - ionic bond involves the transfer of electrons
2. Why do atoms bond together to form molecules?
   to get full electron shells and be stable like a noble gas
3. Define electronegativity.
   the ability to attract and/or gain electrons
4. What are the three types of intramolecular bonds? How do they differ?
   ionic = complete transfer of electrons
   polar covalent = unequal sharing of electrons
   non-polar covalent = equal sharing of electrons
5. Identify the kind of intramolecular bonding contained in each of the following:

HI,	F_2,	MgO,	O_2,	AsH_3,	PCl_3
polar	non-polar	ionic	non-polar	non-polar	polar

6. What are the three types of intermolecular bonding from strongest to weakest.
   hydrogen bonding, dipole-dipole forces, dispersion forces
7. Identify the kind of intermolecular bonding in each:

HI,	F_2,	MgO,	O_2,	AsH_3,	PCl_3,	H_2O
dipole-dipole	dispersion	ionic	dispersion	dispersion	dipole-dipole	hydrogen bonding

8. What is a double bond?
   sharing of 4 electrons
9. How does the distance between atoms change if a single, double or triple bond is present? What bonds are the strongest?
   triple: shortest + strongest single: longest and weakest
10. What is the general trend in electronegativity as you go from left to right across the periods and bottom to top of the periodic table.
    left to right: increase
    bottom to top: increase

11. By looking only at the periodic table, arrange the following sets in order of increasing electronegativity:

a) O, P, S — P, S, O

b) Mg, Al, Si, — Mg, Al, Si

c) C, Si, N — Si, C, N

12. Arrange the bonds in each of the following sets in order of increasing polarity:

a) H---F, O---F, B---F — O··F, H··F, B··F

b) N---N, N---P, N---O — N···N, N··O, N··P

13. Draw the Lewis dot diagram for selenium with the correct number of valence electrons.

14. How many electrons must sulfur gain in order to get a stable octet?

two

15. Draw Lewis diagrams for each of the following.

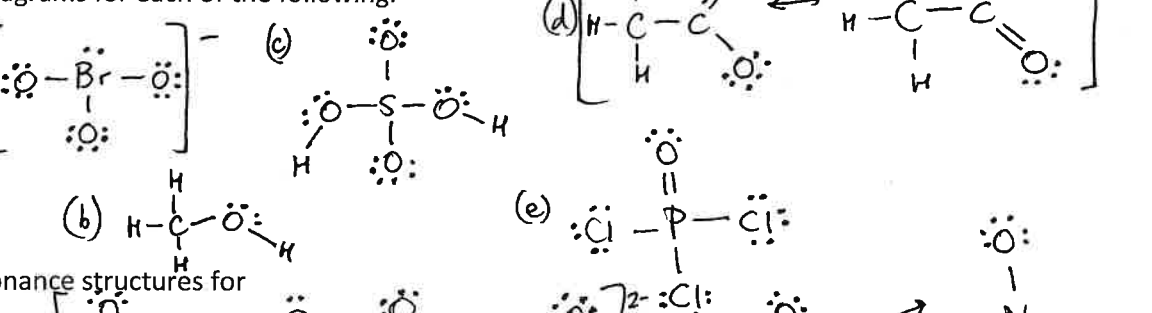
a) BrO_3^-

b) CH_3OH

c) H_2SO_4

d) CH_3COO^-

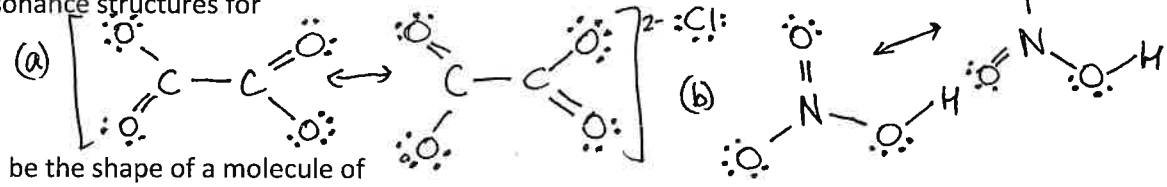
e) $OPCl_3$



16. Draw the resonance structures for

a) $C_2O_4^{2-}$

b) HNO_3



17. What would be the shape of a molecule of

a) CO_2 linear

b) H_2S bent

c) NH_3 trigonal pyramidal

18. Would a molecule of CH_3Br be polar or nonpolar? What about the polarity of the molecules in #17?

polar

a) non-polar (b) polar (c) polar

19. Explain why water would have a higher boiling point than H_2S.

intermolecular bonding in water is hydrogen bonds, stronger than the dipole-dipole forces in H_2S ∴ H_2O molecules take more energy to separate

20. Which would have the shorter bond length, H and S in H_2S or C and N in HCN?

C and N in HCN as it's a triple bond