Che 111: Chapter 3 Practice Problems

1. Classify each of the following as a pure substance or a mixture. If it is a pure substance, is it an element or a compound?
    a. fluorine (used to make fluorides, such as those used in toothpaste)
    b. Toothpaste

2. Write the chemical formula for each of the following compounds. List the symbols for the elements in the order that the elements are mentioned in the description
    a. A compound with molecules that consist of two phosphorus atoms and five oxygen atoms.
    b. A compound that contains three calcium atoms for every two nitrogen atoms.

3. Classify each of the following as either a molecular compound or an ionic compound.
    a. Cadmium fluoride, CdF_2 (a starting material for lasers)
    b. Sulfur dioxide, SO_2 (a food additive that inhibits browning and bacterial growth)

4. How many valence electrons does each atom of the following elements have?
    a. N
    b. S

5. Draw a Lewis structure for each of the following formulas.
    a. Nitrogen trifluoride, NF_3 (used in high-energy fuels)
    b. Chloroethane, C_2H_5Cl (used to make the gasoline additive tetraethyl lead)

6. Write the name for each of the following chemical formulas.
    a. ClO_2 (a commercial bleaching agent)
    b. C_2H_6 (in natural gas)

7. Write the chemical formula for each of the following names.
    a. tetraphosphorus hexasulfide (used in organic chemical reactions)

    b. hydrogen chloride (used to make hydrochloric acid)

8. How many protons and electrons do each of the following ions have?
    a. N^{3-}
    b. Ba^{2+}

9. Write the name for each of these chemical formulas.
    a. Ca_3P_2 (in signal flares)
    b. NH_4HSO_4 (in hair wave formulations)

10. Write chemical formulas for each of the following names.
    a. Barium chloride (used in manufacture of white leather)
    b. Magnesium hydrogen phosphate (a laxative)