Please show your work for all calculations, and report answers to the proper number of significant digits to receive full credit. For calculations, circle your final answer.

1. Write the correct formula for each of the compounds named below, and designate each compound as soluble (S) or insoluble (I), based on the solubility rules in Table 4.2. You must memorize these rules.
   a. ammonium carbonate
   b. calcium nitrate
   c. manganese(II) sulfate
   d. silver nitrate (silver is always in the +1 oxidation state)

2. Write molecular equations for precipitation reactions using the aqueous reactants given below. Hint: the reactants are the same as your answers to #1.
   a. ammonium carbonate + calcium nitrate
   b. manganese(II) sulfate + silver nitrate

3. Write full ionic equations for both of your reactions in #2. Circle all spectator ions.
   a. 
   b. 

4. Write net ionic equations for both of your reactions in #3.
   a. 
   b. 

Continued on reverse.
5. Classify each of the following reactions as precipitation, neutralization, or redox, and provide products for and balance each equation.

a. _____ K₂CO₃ (aq) + _____ HBr (aq) →

b. _____ AgNO₃ (aq) + _____ Fe (s) →

6. 0.863 g of sodium carbonate is dissolved in enough water to make 500.00 mL of solution. Calculate the molarity of the solution that is formed.

7. Water is a molecular compound, and therefore a nonelectrolyte; however, it is common knowledge that water from natural sources and from the tap conducts electricity. Suggest a reason why the water that we use under everyday circumstances can conduct electricity, even though the compound H₂O is not an electrolyte. (Hint: only solutions of electrolytes can conduct electricity.)