AP Exam Review- More Colligative Name: _____ Period: ____

(1) Five beakers each containing 100.0 mL of an aqueous solution are placed on a lab bench. The solutions are all at 25°C. Solution 1 contains 0.20 M KNO_3. Solution 2 contains 0.10 M $BaCl_2$. Solution 3 contains 0.15 M $C_2H_4(OH)_2$. Solution 4 contains 0.20 M $(NH_4)_2SO_4$. Solution 5 contains 0.25 M $KMnO_4$.

a. One of the solutions could oxidize two of the other solutions. Which solution is it? Which solutions could it oxidize?
b. Which solution has the lowest pH? Explain.
c. Which pair of solutions would give a precipitate if they are mixed? What is the formula for this precipitate?
d. Which solution would be the poorest conductor of electricity? Explain.
e. Rank the solutions in order of increasing boiling point. Explain.

(2) Five beakers are placed in a row on a countertop. Each beaker is half filled with a 0.20 M aqueous solution. The solutes, in order, are: (1) potassium sulfate, (2) methyl alcohol, (3) sodium carbonate, (4) ammonium chromate, and (5) barium chloride. The solutions are all at 25°C.

Answer the following questions with respect to the five solutions listed above.

a. Which solution will form a precipitate when ammonium chromate is added to it? Give the formula of the precipitate.
b. Which solution is the most basic? Explain.
c. Which solution will exhibit the lowest boiling-point elevation? Explain.
d. Which solution is colored?
e. Which of the other solutions will not react with solution (5), barium chloride?