Limiting Excess Reagent Problems

1. For the double displacement reaction:

$$2Fe(NO_3)_3 + 3Na_2S \rightarrow Fe_2S_3 + 6NaNO_3$$

If 50.0 g of each reactant is used, what is the maximum possible mass of iron(III) sulphide that could form.

2. For the synthesis of nitrogen triiodide (NI_3), 0.5 mol of nitrogen gas and 500 g of iodine (I_2) are allowed to fully react. What mass of nitrogen triiodide could you expect to form?

3. For the double displacement reaction between calcium nitrate and sodium phosphate, 95.0 g of calcium nitrate is reacted with 70.0 go sodium phosphate. Determine the maximum possible mass of calcium phosphate that could form.

4. Lithium carbonate can be formed through the reaction between lithium nitrate and sodium carbonate. It 60.0 g each of lithium nitrate and sodium carbonate are allowed to react, what mass of lithium carbonate could form?

5. For the reaction between 500 mL of 2.0 M H_2SO_4 solution and 400 mL of 5.0 M NaOH solution, what is the maximum possible concentration of Na_2SO_4 that could be reached? Be sure to consider the total volume for your final calculations of Na_2SO_4