Unit 4 Chemical reactions FRQ set 1

Unit 4 - Chemical Reactions - Free Response I

Test Question ___   **Name:**_____

a) The following questions pertain to the chemical reaction below.

$$6\ Li_{(s)} + N_{2(g)} \rightarrow 2\ Li_3N_{(s)}$$
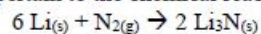
    I.   Find the limiting reactant when 14.6 g of Li react with 24.2 g of N_2.

    II.   Find the percent yield if only 19.8 g of Li_3N are produced.

b) A solid strip of polished magnesium ribbon is dropped into a silver nitrate solution.
    a. Write the balanced net ionic equation for the reaction.

    b. Identify the species that is oxidized in this reaction.

c) Water is mixed with solid calcium nitrate in a beaker. Write the balanced net ionic equation for the reaction.

d) A rigid 7.80 L sealed vessel containing 2.700 mol of $O_{2(g)}$, 0.600 mol of $C_2H_{4(g)}$, and 2.400 mol of $Ne_{(g)}$ has an internal temperature of 85.0°C. A lab technician ignites the mixture in the vessel and the following reaction occurs: $C_2H_{4(g)} + 3$ $O_{2(g)} \rightarrow 2\ CO_{2(g)} + 2\ H_2O_{(g)}$. Find the mole fraction of each gas in the vessel after the reaction.

e) A solution of hydrobromic acid is poured over a solid piece of calcium.
   I.   Write the balanced net ionic equation for the reaction.

   II.   Which species is reduced in this reaction?

f) A piece of copper wire is placed in a solution of nitric acid.
   I.   Write the balanced net ionic equation for the reaction.

   II.   Which species is oxidized in this reaction?

g) Solid copper is placed in a solution of copper (II) sulfate, and the system is left for an extended period of time.
   I.   Write the balanced net ionic equation for the reaction.

   II.   What is the balanced oxidation half reaction?