1) How many moles of \( \text{PH}_3 \) can from the complete reaction of 5.0 mol of \( \text{H}_2 \)? With elemental phosphorus? The balanced equation is:

\[
P_4(s) + 6\text{H}_2(g) \rightarrow 4\text{PH}_3(g)
\]

3.3 mol

2) A 3.1-mol sample of \( \text{KClO}_3 \) was decomposed according to the equation below. How many moles of \( \text{O}_2 \) are formed assuming 100% yield?

\[
2\text{KClO}_3(s) \rightarrow 2\text{KCl}(s) + 3\text{O}_2(g)
\]

4.7 mol

3) For the reaction below, if 5.5 mol of \( \text{CO}_2 \) are produced, how many moles of \( \text{O}_2 \) were reacted?

\[
\text{C}_2\text{H}_4(g) + 3\text{O}_2(g) \rightarrow 2\text{CO}_2(g) + 2\text{H}_2\text{O}(g)
\]

8.2 mol

4) In the reaction below, what number of grams of silver can be produced from the reaction of 55.0 g of copper?

\[
\text{Cu}(s) + 2\text{AgNO}_3(aq) \rightarrow 2\text{Ag}(s) + \text{Cu(NO}_3)_2(aq)
\]

187 g
5) If 19.2 g of CO$_2$ is produced in the reaction of C$_2$H$_2$ with O$_2$ to form CO$_2$ and H$_2$O, how many grams of H$_2$O are produced in this reaction?

3.93 g

6) For the reaction below, how many molecules of H$_2$O can be produced from 32.7 g of NaOH and excess Cl$_2$?

\[ 2\text{Cl}_2(g) + 4\text{NaOH}(aq) \rightarrow 3\text{NaCl}(aq) + \text{NaClO}_2(aq) + 2\text{H}_2\text{O}(l) \]

\[ 2.46 \times 10^{23} \text{ molecules H}_2\text{O} \]

7) If 3.35 mol A and excess B react by the equation below, and 4.00 mol C are recovered, what is the percent yield of this reaction?

\[ 2\text{A} + \text{B} \rightarrow 3\text{C} + \text{D} \]

79.6 %

8) When 10.0 mol of calcium metal is reacted with 3.9 mol of oxygen gas, how much calcium oxide is produced?

7.8 mol