1. Balance and classify the following reactions as combination, decomposition, single replacement, double replacement, or combustion:

A) \( \text{C}_4\text{H}_{10}(l) + \text{O}_2(g) \rightarrow \text{CO}_2(g) + \text{H}_2\text{O}(g) \)

B) \( \text{P}_2\text{O}_5(l) + \text{H}_2\text{O}(l) \rightarrow \text{H}_3\text{PO}_4(\text{aq}) \)

C) \( \text{Al}^(\text{III})\text{Cl}_3(s) \rightarrow \text{AlCl}_3(s) + \text{O}_2(g) \)

D) \( \text{Br}_2(l) + \text{ZnI}_2(s) \rightarrow \text{ZnBr}_2(s) + \text{I}_2(s) \)

E) \( \text{NaI}(\text{aq}) + \text{Pb(NO}_3)_2(\text{aq}) \rightarrow \text{PbI}_2(s) + \text{NaNO}_3(\text{aq}) \)

2. Complete and balance the following reactions:

A) \( (\text{NH}_4)_3\text{PO}_4(\text{aq}) + \text{KNO}_3(\text{aq}) \rightarrow \)

B) \( \text{Ag}(s) + \text{Al(NO}_3)_3(\text{aq}) \rightarrow \)

C) \( \text{C}_3\text{H}_7\text{OH}(l) + \text{O}_2(g) \rightarrow \)

D) \( \text{Cl}_2(g) + \text{CaBr}_2(\text{aq}) \rightarrow \)

E) \( \text{H}_3\text{AsO}_4(\text{aq}) + \text{NaOH}(\text{aq}) \rightarrow \)

Which reactions will actually take place?

3. For the given balanced chemical equation:

\( \text{Na}_2\text{FeCl}_6(s) + 2\text{Na}(l) \rightarrow 8\text{NaCl}(s) + \text{Fe}(s) \)

A) Which element is oxidized? __________________

B) Its oxidation number changes from _______ to _______.

C) Which element is reduced? ________

D) Its oxidation number changes from _______ to _______.

E) Which reactant is the oxidizing agent? ______________

F) Which reactant is the reducing agent? ______________