1. (a) Write the electron configuration of the ground state of an element whose atomic number is 18.
   (b) Is this element chemically reactive? Why?
   (c) What is the name of this element? (10%)

2. Please name the following compounds *in English*. (15%)
   (a) $FeCl_2$
   (b) $Cu(NO_3)_2$
   (c) $PbCrO_4$
   (d) NH_4HCO_3
   (e) $KClO_4$

3. *For each* of the following terms *define* and *give an example*. (15%)
   (a) strong electrolyte
   (b) polyprotic acid
   (c) isotopes
   (d) Brønsted-Lowy base
   (e) electronegativity

4. Describe in detail steps how to prepare 1000 mL of 1.0 M H_2SO_4 from concentrated sulfuric acid (95% w/w, specific gravity 1.83). (15%)

5. Hydrogen and iodine react according to the eqation

   $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$
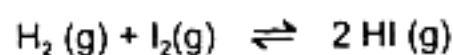
   Suppose 1.00 mol H_2 and 2.00 mol I_2 are placed in a 1.00-L vessel. How many moles of substances are in the gaseous mixture when it reaches equilibrium at 458 °C? The equilibrium constant K_c at this temperature is 49.7. (15%)

6. Hydrogen gas is produced by the following reaction --

   $2HCl(aq) + Zn(s) \rightarrow ZnCl_2(aq) + H_2(g)$
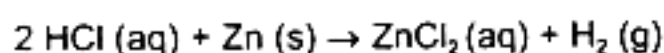
   For some strange reasons, the gas is collected over boiling water. If 346 mL of gas is collected and the total pressure is 777mmHg, what is the mass of hydrogen collected (15%)

7. Draw a phase diagram of oxygen, O_2, from the following infomation:

normal melting point	-218 °C
normal boiling point	-183 °C
triple point	-219 °C, 1.10 mmHg
critical point	-118 °C, 50.1 atm

   Label each of the phase regions on the diagram. (15%)