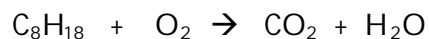## CHM 101 EXAM II

Show all calculations with units and proper number of significant figures! Write in clear and complete sentences. Turn in the 20-point take-home component with this exam. **GOOD LUCK!!!!!!**

1.   Balance the following reaction (no fractions)   (4)

$$C_8H_{18} \ + \ O_2 \ \rightarrow \ CO_2 \ + \ H_2O$$

2.   Predict the product, balance and using the solubility rules, attached to back of exam, determine the state of the products.   (8)

$$Fe \ (s) \ + \ HCl \ (aq) \ \rightarrow$$

$$AgNO_3 \ (aq) \ + \ Na_3PO_4 \ (aq) \ \rightarrow$$
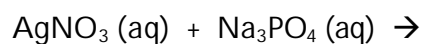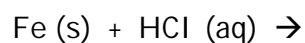
3.   Write the electron configuration and circle the valence electrons for the following.   (10)

Ca

Br

4.   Write the electron configuration of the following ions and state which noble gas they are isoelectronic with.   (10)

p^{-3}

Mg^{+2}

5.   Circle the correct answer.   (10)

   largest size   Al Al^+ Al^{+3}

   largest I E for next electron removed   Al Al^+ Al^{+3}

   smallest atomic size   Na   Al   S

   most electronegative metal   Na   Al   S

   highest electron affinity   N   O   F

6.   How many carbon atoms are contained in a 1.2 carat diamond (pure carbon).
                                                                                            (8)

                          (1 carat = 200 mg)

7.   Draw the Lewis dot structures for the two compounds given below. The carbon
     is in the center. Electronegativites are given on the last page.   (10)

             CS_2 CH_2Cl_2
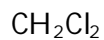
     What is the direction of electron migration in the C-Cl bond?

8.   How many unpaired electrons does a manganese atom have?   (3)

A reaction in aqueous solution in a beaker was endothermic. How would detect this?   (3)

What type of bonding occurs in each compound? Why?   (4)

   KCl   NO

9.   How many grams of ammonia can be produced by reacting 100 grams hydrogen with an excess amount of nitrogen?   (10)

$$N_2 \;+\; 3\,H_2 \;\rightarrow\; 2\,NH_3$$