US 110 Take-Home Test 1. Jordan, Fall 2005

Name_____

By submitting this exam, I affirm that I have neither given nor received unauthorized aid on this assignment.

You must show all work for credit. Express each answer to the correct number of significant figures.

Useful information: 1 m = 1.094 yd, $°C = \dfrac{5}{9}(°F - 32)$ $°F = \dfrac{9}{5}(°C) + 32$, 1 in =2.54 cm, 1 kg = 2.2 lbs, 1 mL= 1 cm^3,

(1)(2 points)

(2)(2 points)

(3)(3.5 points) List the 7 base SI units and the property each one measures

(4)(8 points) Conversions
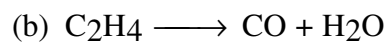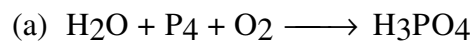(a) Convert 37 in to m

(b) What is -40 ºC in ºF?

(c) Convert 26.5 cm to nm

(d) 4.04 m^3 to quarts

(5)(4 points) Balance the following equations

(a) $H_2O + P_4 + O_2 \longrightarrow H_3PO_4$

(b) $C_2H_4 \longrightarrow CO + H_2O$

(6)(2 points) Complete the equation by switching the cations and anions of the reagents, then balance the equation (metathesis reaction)

$(NH_4)_3PO_4 + Ca(OH)_2 \longrightarrow$
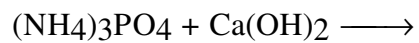
(7)(5 points) List 4 points of Dalton's Atomic theory including the one that was later found to be incorrect (and circle the one that was incorrect).

(8)(5 points) The density of mercury is 13.59 g/mL. What volume of mercury has a mass of 100 kg? Would this fit into a 2 L pop bottle?

(9)(4 points) Whose experiment determined the mass of the electron? How did he do it?

(10)(4 points) Classify the following as either element, compound, heterogeneous mixture, or homogeneous mixture.

(a) table salt

(b) water

(c) sucrose

(d) Windex® window cleaner

(11)(4 points) On another planet, calcium has only two naturally occuring isotopes. Given the information below what is the average molecular weight that should go on the periodic table for the planet (this will not be the actual mass on OUR the periodic table).

^{40}Ca mass = 39.963 amu, abundance = 71.58%

^{46}Ca mass = 45.954 amu, abundance = 28.42%

(12)(4 points) Perform the following calculations to the correct number of significant figures.

(a) $\dfrac{263.5973 \ + \ 2.37}{62.375 \ - \ 0.055} =$

(b) 763.63 + 0.004 + 0.05 =

(13) Fill in the following table (4 points)

	Formula	Name
a	H_2SO_4	
b		calcium chloride
c	SO_3	
d		iron (III) nitrate

Extra Credit: A certain copper mine processes an ore that is almost pure Cu_2O. After opening up a new vein, the operators found that the normal processing wasn't working with the ore. The analysis of the copper compound in the ore found that it was 20.1% oxygen and 79.9%Cu