Practice Exam 1 For Chem 1124, Fall 2011

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, $^{\circ}C = \frac{5}{9}(^{\circ}F - 32)$ $^{\circ}F = \frac{9}{5}(^{\circ}C) + 32$, 1 in =2.54 cm, 1 kg = 2.2 lbs, 1 mL= 1 cm^3, 1 L = 1.056 qt

(1)(4 points) Describe the difference between the plum or raisin pudding model of the atom and Rutherford's model of the atom.

(2)(2 points) Fill in the following table

isotope	protons	neutrons	electrons
$^{32}_{14}Si$			
$^{210}_{82}Pb$			

(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) 4.04×10^2 mL to quarts

(5)(5 points) List 4 points of Dalton's Atomic theory

(6)(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?

(7)(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

(8)(4 points) Perform the following calculations to the correct number of significant figures.

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

(b) $763.63 + 0.004 + 0.007 + 0.05 =$

(9) Fill in the following table of electron configurations

element	n=1	n=2	n=3
aluminum	2	8	3
Be			
	2	8	5
He			

(10) A sample contains 4.50 g of NH_3.

(a) How many moles of NH_3 are in the sample?

(b) How many hydrogen atoms are in the sample?

(11) A β-particle is an electron from the nucleus. How do you get an electron from the nucleus of an atom?

(12) Fill in the table with the number of protons, neutrons and electrons in the following species:

Species	protons	neutrons	electrons
^{17}O			
$^{33}S^{2-}$			
^{23}Na			

(13) What ion will each of the following atoms form?

(a) Al

(b) N

(c) Se

(14) Complete the following nuclear equations

(a) ^{15}O ---> $^{0}_{-1}e$ + ?

(b) ^{66}Cu ---> ^{66}Zn + ?

(c) ^{192}Pt ---> ^{188}Os + ?

(15) How are radioactive isotopes used to determine bone density?