Name: _____

Instructor: Mills

Chemistry 100: 1st Practice Midterm Examination

Answer all five questions. Each question is worth 30 points. Please ensure you have all *five* pages of questions, as well as a formula sheet *before* starting work. For numerical answers, include the correct number of **significant figures** and appropriate **S.I. unit(s)**. For full credit you must….

Show all work

Question	Score
1	
2	
3	
4	
5	
Total	

"The wire"

A copper (Cu) wire has a mass of 4.00 pounds and a diameter of 5.00 mm. **Determine the wire's mass, and volume in the units specified below. Include any appropriate decimal prefixes in your final answers**.
Density copper = 8.95 gcm^{-3}

Mass of the wire in kg:

Volume of the wire in cm^3:

"Conversions"

Complete the following conversions (include correct number of sig. figs.):

95.5 pounds to kg

1032 cm to meters

12.5 miles to km

-156 ^{o}C to Kelvin

1300 Cal to kJ

"Mixtures, Elements and Compounds"

State whether the following are classified as elements, compounds or mixtures:

Diamond:

Carbon dioxide gas:

Air:

A cup of coffee:

Water:

Sand (SiO_2):

Oxygen gas:

Gasoline

Fresh Milk:

Gold:

Ice Cube

A jar containing H_2 and O_2 gasses:

"Sketch"

Sketch a fully labeled diagram illustrating the appearance of a 100 mL cylinder after the following items have been added to it:

Material	Density (g/cm^3)
40 mL D.I. water	1.000
A medium sized silver ring	10.50
40 mL liquid mercury	13.6
A small gold coin	19.32
20 mL Olive oil	0.756

"Symbols"

Write complete atomic symbols for the isotopes described by:

1. A mass number of 14 and an atomic number of 6

2. A total of 30 neutrons and 25 protons in it's nucleus

3. A total of 47 electrons and a mass number of 109

4. The isotope of chlorine with a mass number of 37

5. The isotope of potassium with 20 neutrons

"Ionic"

Write the formulas and names of nine ionic compounds that may be formed through combining the anions and cations ions listed immediately below.

H^+ Cu^{2+} Al^{3+} Cl^- SO_4^{2-} PO_4^{3-}

Ionic Formula	Name of Ionic Compound

Data sheet (periodic table also provided)

Density = mass/volume	1 kg = 2.205 lb	1 cm^3 = 1 mL = 1 $x10^{-6}$ m^3
Density copper (Cu) = 8.95 gcm^{-3}	1 inch = 2.54 cm	1 mile = 1.6039 km
1 cm = 10 mm	1 ft = 12 inches (exactly)	1 gallon = 3.786 L
Volume cylinder = $\pi r^2 h$	$1dm^3 = 1L = 10^{-3}m^3$	1 Cal = 4.184 kJ

Common Decimal Prefixes

Prefix	Symbol	Exponential Notation
Giga	G	10^9
Mega	M	10^6
Kilo	k	10^3
deci	d	10^{-1}
centi	c	10^{-2}
milli	m	10^{-3}
micro	μ	10^{-6}
nano	n	10^{-9}