CHEMISTRY QUARTER 1 REVIEW -ANSWERS

1. Write the number 0.0045 in proper scientific notation: ___**$4.4x10^{-3}$**__
2. Write the number 620 000 in proper scientific notation: ___**$6.2x10^{5}$**_____
3. Convert the measurement 0.0007 grams to milligrams: ___**0.7 mg**_____
4. Convert the measurement 31.2 grams to kilograms: _____**0.0312 kg**_____
5. Ethylene glycol is a liquid that has a density less than water but more than oxygen gas that has a density of 0.0014 g/mL Predict the density. **It's a liquid! Gases have low densities. Perhaps 0.7 g/ml**
6. What volume will 213 grams of iron (D_{Fe} = 7.874 g/ml) occupy? ___**27.0 ml** (divide mass by density)___
7. What is the mass of 38.22 mL of Al (D_{Al} = 2.70 g/ml) ___**103.2 g** (multiply mass and density)_____
8. Percent Error: Theoretical density of Cu is 8.96 g/cm^3 but you found it to be 9.11 g/cm^3, what is your percent error? ____**1.7%**_____
9. Rank (smallest to largest) the relative order of size of particles of molecule, atom, electron, proton. **e-< p < atom < molecule**
10. Know chemical and physical changes.
11. Elements, compounds and mixtures:
    How could you separate sand from water? **Filtration**
    How could you separate salt from water? **Evaporation**
    How could you separate the elements from a compound? **Chemical changes**
12. Compounds have (**definite** / variable) composition. Mixtures have (definite / **variable**) composition.
13. All atoms of the same element have the same number of ____. **Protons**
14. Isotopes differ because of different number of ____ . **Neutrons**
15. Cu has a specific heat (C_p) of 0.384 J/g.^{o}C. Al has a C_p of 0.900 J/g.^{o}C. Pb has a C_p of 0.129 J/g.^{o}C. If equal masses of these three metals start at the same temperature and each absorbs the same amount of heat, which one will have the lowest final temperature? _____**Al**_____ Which absorbed more heat? ____**SAME**_____
16. Heat is transferred due to a difference in __**Temperature (Kinetic Energy)**__ . Which direction does the heat flow? __**High temperature to low temperature**___ .
17. What makes an ionic compound? ___**metal bonded to a non-metal**___ A covalent compound? ___**2 non-metals**__
18. Know the general properties of the Periodic Table's family groups. Most reactive, least reactive.
19. Know the common ionic charge of the family groups. Ex. Alkali metals = +1, etc.
20. Know the states of matter at RT (room temperature) of the elements. Solids, liquids, and gases
21. How many atoms of N, H, P, and O are indicated in the compound ammonium phosphate $(NH_4)_3PO_4$?
    N= 3, H=12, P=1, O=4
22. Which elements are diatomics? **7, H_2, N_2, O_2, F_2, Cl_2, Br_2, I_2**
23. Naming and writing formulas of compounds.

Free Response Questions.

1. (4 Pts.) Density. Concepts, not calculations. Ex. Hot air will rise. Know the density of water.

2. (2 Pts.) Know the difference and able to compare an atom with an ion.
   Ex. How does the sulfur atom compare with the sulfide ion?
   Sulfur atom: neutral. 16 e^- = 16 protons,. S^{2-} ion: 16 protons anion gained 2 e^- so 18 e^-

3. (2 Pts.) A piece of metal with a mass of 87.02 grams has an initial temperature of 100.0^{o}C. It's dropped into 135.00 grams of water at 22.0^{o}C. The metal cools off and the water warms up. Both end at a temperature of 23.9^{o}C. Calculate the C_p of the metal. $Q_{H2O} = Cp \times m \times \Delta T = 4.18$ J/g.^{o}C x 135.00 g x (23.9-22.0^{o}C) = 1070 J
   $Q_{H2O} = Q_{metal}$
   1070 J = Cp x 87.02 g x (100.0 – 23.9^{o}C)
   Cp_{metal} = 0.16 J/g.^{o}C

3. (2 pts.) A 165.81 gram piece of a metal (Cp = 0.334 J/g·^{o}C) absorbs 4610 J of heat. If the initial temperature of the metal piece is 16.0^{o}C, what will the final temperature be?
   Solve for ΔT
   4610J = 0.334 J/g.^{o}C x 165.81 g x ΔT
   ΔT= 83.2 ^{o}C
   Metal absorbed heat. T increases, so 16.0^{o}C + ΔT (83.2^{o}C) = **99.2^{o}C**