CHEM 1100 Dr. Stone Exam 1 Name_____

D = m/v	2.205 lbs = kg	28.35 g = ounce (dry)	Volume of a cylinder = $\pi r^2 h$
0.62 miles = km	2.54 cm = inch	29.57 mL = ounce (liquid)	1000 L = m^3
1.05669 qt = L	K = 273.15 + C	mL = cm^3	F = $\frac{9}{5}$C + 32

Show your work. **No work = no points**. Report all answers to the correct number of significant figures, use scientific notation and correct units. When provided, put your answers in the box.

1. (5 points) A swimming pool is 9.2 m long, 6.2 m wide and 2.2 m deep. A pump can remove water at a rate of 12.5 L per second. How long will it take to decrease the water level by 12.0 cm?

2. (5 points) A penny weighs 2.47g. How much is 10.5 lbs of pennies worth?

3. (5 points) What is the density of a metal cylinder that weighs 60.05 grams. The cylinder is 5.7 cm long and has a diameter of 2.2 cm.

4. (5 points) A piece of metal is put into a graduated cylinder. Before the metal was added, the volume of water in the cylinder was 42.67 mL. After the metal was added to the graduated cylinder, the water level measured 52.35. The piece of metal weighed 76.451 g. What is the density of this piece of metal.

5. (5 points) There are two isotopes of Gallium, ^{69}Ga has an atomic weight of 68.9256 amu and ^{71}Ga has an atomic weight of 39.892 amu. The weighted average of both isotopes is 69.723 amu. What is the percentage of each isotope of Gallium?

6. (5 points) Tayron Guerrero was an MLB (Maimi Marlins rookie) pitcher who recorded the fastest pitch in a major league game in 2018, which was clocked at 101.8 mi per hour. What was this speed in m/s?

7. (5 points) A human hair is 0.0851 mm thick. Sodium ions have a diameter of 102 pm. How many sodium ions can be laid across the diameter of a human hair?

8. (6 points) Complete the following table

Isotope	Number of protons	Number of neutrons	Number of electrons
^{54}Mn			
^{18}O			

9. (6 points) Write the correct names for these formulas, correct spelling is important:

a. KCl_____

b. MgO _____

c. $Ca(NO_3)_2$ _____

d. P_2O_{10} _____

e. $Co_3(PO_4)_2$ _____

f. NaOH_____

10. (7 points) Write the correct formulas for these compounds:

a. Strontium sulfate _____

b. Lithium nitrate _____

c. Copper(II) chlorate_____

d. Chromium(III) oxide _____

e. Carbon dioxide_____

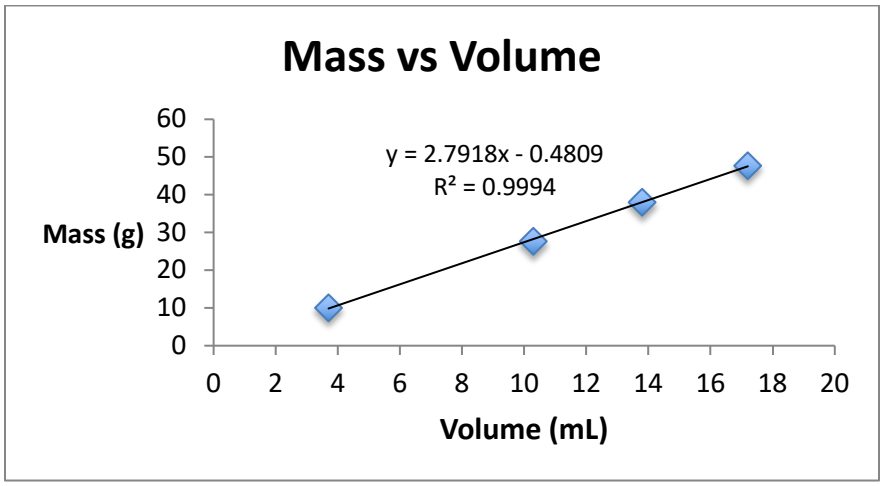
f. Calcium carbonate_____

g. Ammonium phosphate_____

11. (12 points) Complete the following table

Name of particle	Symbol	Mass (amu)	Charge
Alpha			
Beta			
Gamma			
Neutron			

12. (5 points) Use the following graph to determine the density of a metal.



Fill in the blank or box, each question is worth 3 points.

13. What process occurs when ice becomes a gas?_____

14. What is used to determine if results from an experiment are accurate? _____

15. What is used to determine if results from an experiment are precise? _____

16. Who used an oil drop experiment to determine the charge of an electron? _____

17. What experiment provided evidence that atoms contained small very dense, massive nuclei with positive charges?

_____

18. What are the bubbles that form in water after it has been boiling for 10 min?_____

19. What new element is formed when Bismuth-209 emits an alpha particle.

20. Who used a cathode ray tube to discover the electron? _____

21. (5 points) How many nanograms are in 5.347 kg?