MULTIPLE CHOICE (2 pts each): Write the letter corresponding to the correct answer on the line next to each question. The LETTER ASSOCIATED WITH THE CORRECT ANSWER <u>MUST BE WRITTEN ON THE LINE NEXT TO</u> <u>THE QUESTION</u> in order to receive full credit.

<u>e</u>	1.) Which of the following is a homogeneous mixture?							
(a) tossed salad	(b) sugar	(c) iron	(d) carbo	n dioxide	(e) bronze	(f) marble		
<u>d</u> of property is this	2.) A red s change in ir	solution be tensity an e	comes more example of?	e and more	pale as water	is added to it. What type		
(a) chemical & in	ntensive (b)	chemical &	extensive	(c) physica	al & intensive	(d) physical & extensive		
<u>c</u> obtained the follo The results were:	3.) A stud	lent measur Test $1 = 5$	red the boili 5.8°C; Test	ing point of $2 = 55.9^{\circ}$ C	f water (known ; Test $3 = 56.0$	n to be 100 °C) and 0°C; Test 4 = 55.6°C.		
(a) both accurate & precise(c) precise but not accurate		(b) accurate but not precise(d) neither accurate nor precise						
<u>c</u> example of the La	4.) The fa	act that both ?	n pentane (C	C_5H_{12}) and	cyclopentene	(C ₅ H ₈) exist is an		
(a) Conservation of mass		(b) Def	(b) Definite proportions		(c) Multiple proportions			
<u>b</u>	5.) How	many electi	ons are in I	Na ⁺ ?				
(a) 9	(b) 10		(c)]	1	(d) 12			
<u>b</u>	6.) Which	of the follo	wing is an	isotope of c	oxygen, 80) ?		
(a) 6 0	(b) ¹⁸ 80	(c)	¹⁶ / ₈ N	(d)	¹⁶ / ₈ O ²⁻			
<u>a</u>	7.) The pe	eriodic table	e is organize	ed based on	l			
(a) number of pro	otons (b)	number of	neutrons	(c) mass	s number	(d) atomic mass		
<u> </u>	8.) What is	s the name	of the acid	with the for	mula HBr?			
(a) bromic acid	(b) mo	onobromic a	acid	(c) hydrob	romic acid	(d) halobromic acid		

9.) How many water molecules are present in cobalt (II) chloride hexahydrate? f (a) 1 (b) 2 (c) 3 (d) 4 (e) 5 (f) 6 (g) 7 (h) 8 (i) 9 (j) 10 d 10.) In the formula $Cr_2(SO_4)_3$, Chromium is a(n): (a) anion with a charge of 2 (b) cation with a charge of 2 (c) anion with a charge of 3 (d) cation with a charge of 3

SHORT ANSWER (10 pts each): Completely answer all of the following questions. Read all questions carefully!!! <u>Show all work</u>. Make sure to include units and report all mathematical answers to the correct number of significant figures. Write final answers in designated boxes or tables when they are provided.

1. A cube with sides measuring 2.53 m has a mass of 0.02713 g. What is the density of the cube in μ g/mL? Report your answer in scientific notation to the correct number of significant figures.

Answer: 1.68 x 10⁻³ μg/mL

2. Fill in the table with the atomic symbol, number of protons, number of electrons, and number of neutrons for each of the elements or ions indicated (the number listed next to the element is the mass number)

Element/ion	Symbol	Protons	Electrons	Neutrons
Chlorine-37	Cl	17	17	20
Chromium-53	Cr	24	24	29
Xenon-129	Xe	54	54	75
Strontium-86 ion	Sr	38	36	48
Fluorine-19 ion	F	9	10	10

- 3. Name the following ionic compounds:
 - a.) NaF sodium fluoride
 - b.) Ca(OH)₂ calcium hydroxide
 - c.) Cr₂S₃ chromium (III) sulfide
- 4. Name the following covalent compounds:
 - a.) N₂O dinitrogen monoxide
 - b.) CF₄ carbon tetrafluoride
 - c.) P₂O₅ diphosphorus pentoxide
- 5. Write formulas for the following compounds:
 - a.) Magnesium bromide MgBr₂
 - b.) Tin (II) carbonate SnCO₃
 - c.) Iron (II) phosphate $Fe_3(PO_4)_2$
 - d.) Xenon hexafluoride XeF₆
 - e.) Diarsenic pentoxide As₂O₅

6.) Determine the percent composition of copper (III) nitrate.	Answer:	25.463 % Cu 16.838 % N 57.699 % O
7. Calculate the following:		
a.) The number of moles in 258.9 g of Ca(OH) ₂ .	Answer:	3.494 mol
b.) The mass of 2.8 x 10 ⁻² moles of Platinum.	Answer:	5.5 g
c.) The number of molecules in 28.3 g of carbon dioxide.	Answer: 3.87 x	10 ²³ molecules
8. How many ions are present in 59.3 g of BaCl _{2?}	Answer:	

5.14 x 10²³ ions

1. (10 pts) For the following reaction: 2 LiOH + CO₂ \rightarrow Li₂CO₃ + H₂O

- If a reaction vessel contains 105.37g LiOH and 140.83g CO₂
 - (a) Which compound is the limiting reagent?
 - (b) What is the theoretical yield?
 - (c) If the reaction produced 152.6 g, what is the percent yield?
- (a) Limiting reagent = LiOH

Answer:

- (b) Theoretical yield = 162.55 g
- (c) % Yield = 93.88%

- 5. (5 pts) Balance the following equations:
 - (a) C_4H_{10} + O_2 \rightarrow CO_2 + H_2O 2 C_4H_{10} + 13 O_2 \rightarrow 8 CO_2 + 10 H_2O

(b) K_2O + $P_4O_{10} \rightarrow K_3PO_4$

 $6 \text{ K}_2\text{O} + P_4\text{O}_{10} \rightarrow 4 \text{ K}_3\text{PO}_4$