Chem 111	S	ummer 201	.5	Exam I		Whelan	
Question 1 4 Points	A general chemist basement of a fri student tried the The student meas Then dropped the displaced <b>17.8 ml</b> This <b>metal is mos</b>	ry student fo end's house. T following exp ured the <b>mass</b> metal into a r of water. <b>t likely</b> :	und a <b>chunk o</b> f o figure out w eriment. s <b>of the meta</b> neasuring cup d = <u>188.89</u> <u>17.8 m</u>	<b>metal</b> in the hat it was, the hat it was, the hat it was, the hat it be 188.8 g. and found that it <u>= 10.6g.m<sup>2-1</sup></u>	Densities of So Substance Water Aluminum Chromium Nickel Copper Silver Lead Mercury Gold Tungsten Platinum	Substances           Density (g/mL)           1.00           2.72           7.25           8.91           8.94           10.50           11.34           13.60           19.28           19.38           21.46	
Question 2 10 Points	<ul> <li>a. Give the correct number of significant figures for each of the following:</li> <li>180: 2.30×10<sup>-3</sup>: 3</li> <li>b. Report the answer for the following operation to the correct number of significant figures: 23.46 - 1.1 = 22.4</li> <li>c. When 58.6 is divided by 77.31, the answer should be reported to 3 significant digit(s).</li> <li>d. How many hours are there in exactly 26 days? 624</li> </ul>						
Question 3 6 Points	A piece of copper contains <b>6.7×10<sup>8</sup> atoms</b> . What is the volume of the sample in units of <b>liters</b> .						
	$1 \text{ cm}^3 \text{ Cu} = 8.8 \text{ g C}$ $1\text{L} = 1000 \text{ cm}^3$	Ц	9.5x10 <sup>21</sup> at 1 mL = 1 cn	coms Cu = 1 g Cu	1 Kg = 1	1000 g	
	No need to do th you may not need 6.7 × 10 <sup>8</sup> ato	te calculation to fill in all oms × 1 9.5	- just set up t the boxes. <u>9</u> X10 <sup>X1</sup> atoms *	the correct diment	isional analysis x <u>1L</u> 100	conversions - D cm <sup>3</sup>	
Question 4 4 Points	The element copper and copper-65 with can conclude that both is copper most copper	er has two sto th an atomic n sotopes have t -65 has the k copper atoms k -63 has the k	ible isotopes, o nass of <b>64.93</b> The same percen nighest percen nave an atomic nighest percen	copper-63 with an amu. From the at- ent natural abundar t natural abundar mass of 63.54 t natural abundar	n atomic mass omic weight of ance ice	of 62.93 amu <sup>:</sup> Cu = 63.54 one	
Question 5 4 Points	Circle those of th electrons.	e following ( <b>if</b>	any) that hav	e the <b>same numb</b>	er of protons,	neutrons and	
	<sup>13</sup> C	¹Н	<sup>24</sup> Mg	<sup>9</sup> Be	<sup>40</sup> Ca <sup>2+</sup>	⁴He	

Question 6 4 Points	A certain element consists of two stable isotopes: Exact Mass (amu) Abundance (%) #1 112.9043 4.28 #2 114.9041 95.72 What is the average atomic mass of this element? <u>Give answer to 6 significant figures</u> 0.0428 (112.9043) + 0.9572 (114.9041) = 114.818 (5086) amul						
	<u>114.819</u> amu						
Question 7 6 Points	Decide if the following statements are true (T) or false (F):						
	a) <b>Protons</b> and <b>neutrons</b> are approximately <b>equal in mass</b> .						
	b) The <b>charge on a proton</b> is <b>the same</b> as the <b>charge of an electron</b> .						
	c) The electron acts as a buffer zone in the nucleus						
Question 8 10 Points	Use the Periodic Table accompanying this exam to answer the following questions:						
	a) <u>Formula</u> for the only diatomic in Period 3						
	b) <u>Symbol</u> for the lightest Alkali Metal.						
	c) <u>Symbol</u> for transition metal in Group IB, Period 4.						
	d) Plutonium (Pu) is a: (metal, nonmetal, metalloid)						
	e) Group IIA are collectively known as the: (Ukalme Zarth Metals						
Question 9	Columbs Law gives that the Force of Attraction (FA): $FA \propto q_a q_b/r^2$ where $q_a$ is the charge						
4 Points	on <b>a</b> while $\mathbf{q}_{\mathbf{b}}$ is the charge on <b>b</b> and <b>r</b> is the distance between them.						
	1. Which of the following have the greatest force of attraction:						
	a. Mg <sup>2+</sup> and O <sup>2-</sup> separated by a distance of <b>419 pm</b> b. Mn <sup>2+</sup> and Se <sup>2-</sup> separated by a distance of <b>295 pm</b>						
	2. Which of the following have the greatest force of attraction: $A = Mo^{2^{+}}$ and $O^{2^{-}}$ separated by a distance of 631 pm						
	b. K <sup>+</sup> and Cl <sup>-</sup> separated by a distance of 226 pm						
Question 10	Give the correct <b>name</b> for the following <b>compounds</b> :						
8 Points	a) Na2S <u>Sodium sulfide</u>						
	b) Mg(NO2)2 Magnesium NITRITE						
	c) Cu <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub> <u>Copper(II) phosphale</u>						
	d) NH4Br annould Spomide						

Question 11	Give the correct <b>for</b>	<b>mula</b> for the follow	ing compounds:	
8 Points	a) <b>Calcium hydr</b> o	oxide	(OH)2	
	b) Aluminum chl	orate	$\underline{O}\left((2O_3)_3\right)$	
	c) <b>Chromium(II)</b>	sulfide	CrS	
	d) <b>Potassium sul</b>	fite	K2503	
Question 12	How many moles of a	Sr are there in a sa	mple that contains 1.10×10 <sup>22</sup> st	trontium atoms?
3 Points	.   0 X   0 <sup>2°</sup>	atoms Sr	I mor	<u>Show Work</u>
		6.023Y	10 <sup>23</sup> atoms	
				-1
			<u></u> .	83×10 mol of Sr
Question 13	How many moles of	<b>Cu</b> 2 <b>SO</b> 4 are present	in <b>1.39 grams</b> of this compound	d?
5 Points	C. C.			<u>Show Work</u>
		ulu m	1.39g Eug504 1 mo	
	2(63.55) + 32.01	F 4(10.00)	223.17	lg _
	= 223.11g.mor			0
				2
			6.23	$10^{-2}$ mol Cu <sub>2</sub> SO <sub>4</sub>
Question 14	A hydrocarbon is a c	ompound composed	purely of hydrogen and carbon.	If a particular
Question 14 6 Points	A <b>hydrocarbon</b> is a c hydrocarbon is found What is the <b>formula</b>	compound composed d to be composed of of this hydrocarbo	purely of hydrogen and carbon. 89.93% C and has a molar mass	If a particular s of <b>120.21</b> g/mol.
Question 14 6 Points	A <b>hydrocarbon</b> is a c hydrocarbon is found What is the <b>formula</b>	compound composed d to be composed of of this hydrocarbo H	purely of hydrogen and carbon. 89.93% C and has a molar mas: n? C3H4	If a particular s of <b>120.21</b> g/mol.
Question 14 6 Points	A hydrocarbon is a c hydrocarbon is found What is the formula C gg 93.	compound composed d to be composed of of this hydrocarbo H 10.070	purely of hydrogen and carbon. 89.93% C and has a molar mas: n? C3H4	If a particular s of <b>120.21</b> g/mol.
Question 14 6 Points	A hydrocarbon is a c hydrocarbon is found What is the formula 69,939 89,939	ompound composed d to be composed of of this hydrocarbo H 10.07g	purely of hydrogen and carbon. 89.93% C and has a molar mass n? C3H4 C3H4 : 3(12.01) +44	If a particular s of 120.21 g/mol.
Question 14 6 Points	A hydrocarbon is a c hydrocarbon is found What is the formula \$9,93g \$9,93g [ m]	compound composed d to be composed of of this hydrocarbo H 10.01g 10.01g 10.01g	purely of hydrogen and carbon. 89.93% C and has a molar mass n? C3H4 C3H4: 3(12.01) +44 = 40.07 g.m	If a particular s of 120.21 g/mol. (1.01)
Question 14 6 Points	A hydrocarbon is a c hydrocarbon is found What is the formula 89.93g 89.93g 10.01g	compound composed d to be composed of of this hydrocarbo H 10.07g 10.07g 10.07g 10.07g 10.07g	purely of hydrogen and carbon. 89.93% C and has a molar mass n? C3H4 C3H4: 3(12.01) + 44 = 40.07 g.m	If a particular s of 120.21 g/mol. (I.01)
Question 14 6 Points	A hydrocarbon is a c hydrocarbon is found What is the formula 89.93g 89.93g 112.01g 7488 md	compound composed d to be composed of of this hydrocarbo H 10.07g 10.07g 10.07g 1.01g 9.970 mol	purely of hydrogen and carbon. 89.93% C and has a molar mass n? C3H4 C3H4 : 3(12.01) + 44 = 40.07 g.m	If a particular s of 120.21 g/mol. (1.01)
Question 14 6 Points	A hydrocarbon is a c hydrocarbon is found What is the formula 89.93g 89.93g 1 mf 12.01g 7 488 mol 7.448 mol	compound composed d to be composed of of this hydrocarbo H 10.07g 10.07g 10.07g 10.07g 10.07g 10.07g 10.07g 10.07g 1.01g 1.01g 9.970 mol	purely of hydrogen and carbon. 89.93% C and has a molar mass n? C3H4 C3H4: 3(12.01) + 44 = 40.07 g.m 120.21 g.ma <sup>2-1</sup>	If a particular s of 120.21 g/mol. (1.01) od -1
Question 14 6 Points	A hydrocarbon is a c hydrocarbon is found What is the formula 89.93g 89.93g 10.01g 7488 mol 7.448 mol 7.448 mol	compound composed d to be composed of of this hydrocarbo H 10.07g 10.07g 10.07g 1.01g 9.970 mol 7.448 mol 1.229	purely of hydrogen and carbon. 89.93% C and has a molar mass n? C3H4 C3H4: 3(12.01) + 44 = 40.07 g.m 120.21 g.ma <sup>2-1</sup> 40.07 g.ma <sup>2-1</sup>	If a particular s of 120.21 g/mol. (1.01) -1 = 3
Question 14 6 Points	A hydrocarbon is a c hydrocarbon is found What is the formula	compound composed d to be composed of of this hydrocarbo H 10.07g 10.07g 10.07g 1.01g 9.970 mol 7.448 mol 1.332 2.664	purely of hydrogen and carbon. 89.93% C and has a molar mass n? C3H4 C3H4: $3(12.01) + 44$ = 40.07 g.m 120.21 g.m 120	If a particular s of 120.21 g/mol. (1.01) -1 = 3
Question 14 6 Points	A hydrocarbon is a c hydrocarbon is found What is the formula	compound composed d to be composed of of this hydrocarbo H 10.07g 10.07g 1.01g 9.970 mol 7.448 mol 1.332 2.664 2.996	purely of hydrogen and carbon. 89.93% C and has a molar mass n? C3H4 C3H4: $3(12.01) + 44$ = 40.07 g.m 120.21 g.mo <sup>2-1</sup> 40.07 g.ma <sup>2-1</sup>	If a particular s of 120.21 g/mol. (1.01) -1 = 3
Question 14 6 Points	A hydrocarbon is a c hydrocarbon is found What is the formula 89.93g 89.93g 10.01g 7488 md 7.448 mol 1.000 X2 2.000 X3 3.000	compound composed d to be composed of of this hydrocarbo H 10.07g 10.07g 1.01g 9.970 mol 9.970 mol 1.332 2.664 3.996	purely of hydrogen and carbon. 89.93% C and has a molar mass n? C3H4 C3H4: $3(12.01) + 44$ = 40.07 g.m 120.21 g.ma <sup>-1</sup> 40.07 g.ma <sup>-1</sup>	If a particular s of 120.21 g/mol. (1.01) = 3



There is one more question on the next page



Do Not Write Below This

