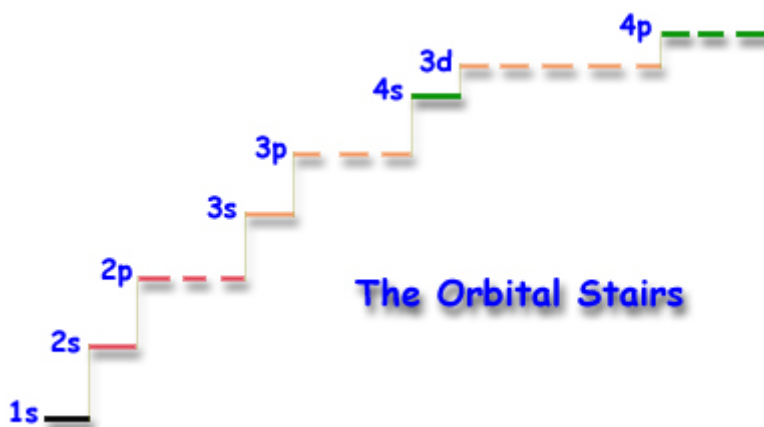


The Periodic Table

											<i>VIIIA</i>						
<i>IA</i> H 1 1.01											He 2 4.00						
<i>IIA</i> Li 3 6.94	Be 4 9.01											<i>IIIA</i> B 5 10.81	<i>IVA</i> C 6 12.01	<i>V</i> N 7 14.01	<i>VIA</i> O 8 16.00	<i>VIIA</i> F 9 19.00	Ne 10 20.18
Na 11 22.99	Mg 12 24.31	<i>IIIB</i>	<i>IVB</i>	<i>VB</i>	<i>VIB</i>	<i>VII B</i>	<i>VIII B</i>	<i>VIII B</i>	<i>VIII B</i>	<i>IB</i>	<i>IIB</i>	Al 13 26.98	Si 14 28.09	P 15 30.97	S 16 32.07	Cl 17 35.45	Ar 18 39.95
K 19 39.10	Ca 20 40.08	Sc 21 44.96	Ti 22 47.88	V 23 50.94	Cr 24 52.00	Mn 25 54.94	Fe 26 55.85	Co 27 58.93	Ni 28 58.69	Cu 29 63.55	Zn 30 65.39	Ga 31 69.72	Ge 32 72.61	As 33 74.92	Se 34 78.96	Br 35 79.90	Kr 36 83.80
Rb 37 85.47	Sr 38 87.62	Y 39 88.91	Zr 40 91.22	Nb 41 92.91	Mo 42 95.94	Tc 43 (97.9)	Ru 44 101.07	Rh 45 102.91	Pd 46 106.42	Ag 47 107.87	Cd 48 112.41	In 49 114.82	Sn 50 118.71	Sb 51 121.76	Te 52 127.60	I 53 126.90	Xe 54 131.29
Cs 55 132.91	Ba 56 137.33	La 57 138.91	Hf 72 178.49	Ta 73 180.95	W 74 183.85	Re 75 186.21	Os 76 190.2	Ir 77 192.22	Pt 78 195.08	Au 79 197.97	Hg 80 200.59	Tl 81 204.38	Pb 82 207.2	Bi 83 208.98	Po 84 (209)	At 85 (210)	Rn 86 (222)
Fr 87 223.02	Ra 88 226.03	Ac 89 227.03	Rf 104 (261)	Db 105 (262)	Sg 106 263	Bh 107 (262)	Hs 108 (265)	Mt 109 (266)	Ds 110 (271)	Rg 111 (272)	Uub 112 (285)	Uut 113 (284)	Uuq 114 (289)	Uup 115 (288)			

Ce 58 140.12	Pr 59 140.91	Nd 60 144.24	Pm 61 (145)	Sm 62 150.36	Eu 63 152.97	Gd 64 157.25	Tb 65 158.93	Dy 66 162.50	Ho 67 164.93	Er 68 167.26	Tm 69 168.93	Yb 70 173.04	Lu 71 174.97
Th 90 232.04	Pa 91 231.04	U 92 238.03	Np 93 237.05	Pu 94 (240)	Am 95 243.06	Cm 96 (247)	Bk 97 (248)	Cf 98 (251)	Es 99 252.08	Fm 100 257.10	Md 101 (257)	No 102 259.10	Lr 103 262.11



Maybe Useful:-

$$1 \text{ amu} = 1.661 \times 10^{-24} \text{ g}$$

$$\text{Avogadro's number} = 6.023 \times 10^{23} \text{ mol}^{-1}$$

SID

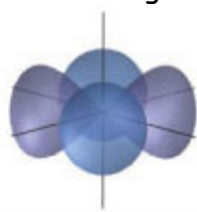
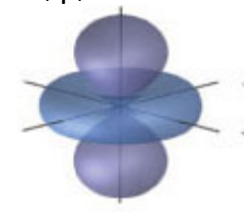
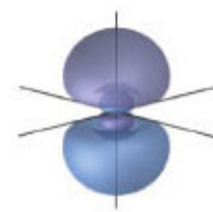

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Last _____

First _____

Question 1 8 Points	<p>a) How many significant figures are there in each of the following numbers? 0.927790 _____ 0.060464 _____ 1.00×10^3 _____</p> <p>b) There are 12 eggs in a dozen. A farm produces 747 dozen eggs a month, how should the number of eggs per month be reported? _____</p> <p>c) The number 447.496 rounded to 4 significant figures is: _____</p>						
Question 2 6 Points	<p>a) When 17.2 is subtracted from 45.58, the result should be reported with digit(s) _____ after the decimal point.</p> <p>b) When 85.49 is divided by 59.6, the answer should be reported to significant _____ digit(s).</p>						
Question 3 3 Points	<p>A piece of copper contains 6.7×10^8 atoms. What is the volume of the sample in units of liters.</p> <table style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 33%; border-bottom: 1px solid black; padding: 5px;">$1 \text{ cm}^3 \text{ Cu} = 8.8 \text{ g Cu}$</td> <td style="width: 33%; border-bottom: 1px solid black; padding: 5px;">$9.5 \times 10^{21} \text{ atoms Cu} = 1 \text{ g Cu}$</td> <td style="width: 33%; border-bottom: 1px solid black; padding: 5px;">$1 \text{ Kg} = 1000 \text{ g}$</td> </tr> <tr> <td style="border-bottom: 1px solid black; padding: 5px;">$1 \text{ L} = 1000 \text{ cm}^3$</td> <td style="border-bottom: 1px solid black; padding: 5px;">$1 \text{ mL} = 1 \text{ cm}^3$</td> <td></td> </tr> </table> <p>No need to do the calculation - just set up the correct dimensional analysis conversions - you may not need to fill in all the boxes.</p> <div style="text-align: center; margin-top: 10px;"> $6.7 \times 10^8 \text{ atoms} \times \frac{\text{_____}}{\text{_____}} \times \frac{\text{_____}}{\text{_____}} \times \frac{\text{_____}}{\text{_____}}$ </div>	$1 \text{ cm}^3 \text{ Cu} = 8.8 \text{ g Cu}$	$9.5 \times 10^{21} \text{ atoms Cu} = 1 \text{ g Cu}$	$1 \text{ Kg} = 1000 \text{ g}$	$1 \text{ L} = 1000 \text{ cm}^3$	$1 \text{ mL} = 1 \text{ cm}^3$	
$1 \text{ cm}^3 \text{ Cu} = 8.8 \text{ g Cu}$	$9.5 \times 10^{21} \text{ atoms Cu} = 1 \text{ g Cu}$	$1 \text{ Kg} = 1000 \text{ g}$					
$1 \text{ L} = 1000 \text{ cm}^3$	$1 \text{ mL} = 1 \text{ cm}^3$						
Question 4 3 Points	<p>A 0.0635 L sample of a liquid has a mass of 87.6 g. Identify it as either nonane (density = 0.719 g/mL) or iodoheptane (density = 1.38 g/mL). _____</p>						
Question 5 3 Points	<p>The element copper has two stable isotopes, copper-63 with an atomic mass of 62.93 amu and copper-65 with an atomic mass of 64.93 amu. From the atomic weight of Cu = 63.54 one can conclude that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> copper-65 has the highest percent natural abundance <input type="checkbox"/> both isotopes have the same percent natural abundance <input type="checkbox"/> most copper atoms have an atomic mass of 63.54 <input type="checkbox"/> copper-63 has the highest percent natural abundance 						
Question 6 6 Points	<p>A certain element consists of two stable isotopes. The first has an atomic mass of 107 amu and a percent natural abundance of 51.8%. The second has an atomic mass of 109 amu and a percent natural abundance of 48.2%. What is the atomic mass of the element?</p> <p style="text-align: right; margin-top: 20px;">_____ amu</p>						

<p>Question 7 6 Points</p>	<p>Decide if the following statements are true (T) or false (F):</p> <p>a) Protons and neutrons are equal in mass, but opposite in charge. _____</p> <p>b) The mass of a proton is about the same as the mass of an electron. _____</p> <p>c) The electron acts as a buffer zone in the nucleus _____</p>
<p>Question 8 10 Points</p>	<p>The following questions pertain to the periodic table given at the front of this exam:</p> <p>a. The atomic number for the element that is in group 4A and period 2? _____</p> <p>b. The atomic weight for the element in group 3A and period 4? _____</p> <p>c. Check the elements that would be expected to have similar properties?</p> <p><input type="checkbox"/> Pb <input type="checkbox"/> Cl <input type="checkbox"/> Be <input type="checkbox"/> I <input type="checkbox"/> Rn</p> <p>d. What is the symbol of the alkali metal that is in period 5? _____</p> <p>e. A student when asked to give the formula for the 7 elements that exist as diatomics, gave the following answer. Circle the incorrect answer and in the space provided give the formula for the diatomic that the students missed</p> <p><input type="checkbox"/> H₂ <input type="checkbox"/> N₂ <input type="checkbox"/> Br₂ <input type="checkbox"/> I₂ <input type="checkbox"/> At₂ <input type="checkbox"/> O₂ <input type="checkbox"/> Cl₂ : _____</p>
<p>Question 9 3 Points</p>	<p>Order the following (from 1-3) in order of the greatest force of attraction: (1 being the greatest and 3 the smallest)</p> <p>a) K⁺ and Cl⁻ separated by a distance of 347 pm _____</p> <p>b) Ca²⁺ and S²⁻ separated by a distance of 347 pm _____</p> <p>c) K⁺ and I⁻ separated by a distance of 412 pm _____</p>
<p>Question 10 8 Points</p>	<p>Give the correct formula for the following polyatomic ions:</p> <p>a) Phosphide _____</p> <p>b) Phosphate _____</p> <p>c) Dihydrogen phosphate _____</p> <p>d) Ammonium _____</p>
<p>Question 11 8 Points</p>	<p>a. Name the compound with the formula MgS? _____</p> <p>b. Name the compound with the formula Fe(NO₂)₂? _____</p> <p>c. What is the formula for sodium hydrogen carbonate? _____</p> <p>d. What is the formula for copper(II) sulfite? _____</p>
<p>Question 12 2 Points</p>	<p>How many moles of sulfur are present in 4.37 moles of S₂F₁₀? <u>Show Work</u></p> <p>_____ mol of S</p>

<p>Question 13 4 Points</p>	<p>How many grams of Al_2O_3 are in 1.03 mol of this compound?</p>	<p><u>Show Work</u></p>
<p>Question 14 6 Points</p>	<p>Balance the following chemical equations using the smallest possible integer coefficients.</p> <p>a) $\underline{\quad} \text{Mg}_3\text{N}_2 (\text{s}) + \underline{\quad} \text{H}_2\text{O} (\text{l}) \longrightarrow \underline{\quad} \text{Mg}(\text{OH})_2 (\text{aq}) + \underline{\quad} \text{NH}_3(\text{aq})$</p> <p>b) The complete oxidation reaction that occurs when cyclopropane (C_3H_6) burns in air. $\underline{\quad} \text{C}_3\text{H}_6 + \underline{\quad} \text{O}_2(\text{g}) \longrightarrow \underline{\quad} \underline{\quad} + \underline{\quad} \underline{\quad}$</p> <p>c) When nitrogen reacts with hydrogen, ammonia (NH_3) is formed $\underline{\quad} \underline{\quad} + \underline{\quad} \underline{\quad} \longrightarrow \underline{\quad} \text{NH}_3$</p>	<p>_____ g Al_2O_3</p>
<p>Question 15 8 Points</p>	<p>a) How many orbitals are there in the shell with $n = 3$ in an atom? _____</p> <p>b) How many types of orbitals are there in the shell with $n = 3$ in an atom? _____</p> <p>c) What is the maximum number of electrons possible in a set of 5d orbitals? _____</p> <p>d) How many 5f orbitals are there in an atom? _____</p>	
<p>Question 16 6 Points</p>	<p>Label the following orbital drawings as s, p, d or f.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>_____</p> </div> <div style="text-align: center;">  <p>_____</p> </div> <div style="text-align: center;">  <p>_____</p> </div> </div>	
<p>Question 17 10 Points</p>	<p>a) Write the complete electronic configuration for phosphorus? _____</p> <p>b) Write the noble gas configuration for vanadium, (V)? _____</p> <p>c) The element with an electron configuration of $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^5$ _____</p> <p>d) Se, $[\text{Ar}]4s^2 3d^{10} 4p^4$, has how many valence electrons? _____</p> <p>e) The element in period 4 that has the Lewis diagram,  _____</p>	

Do Not Write Below This

Exam I Score