The Periodic Table

IA																	VIIIA
H 1 1.01	IIA											IIIA	IVA	VA	VIA	VIIA	He 2 4.00
Li 3 6.94	Be 4 9.01											B 5 10.81	C 6 12.01	N 7 14.01	O 8 16.00	F 9 19.00	Ne 10 20.18
Na 11 22.99	Mg 12 24.31	IIIB	IVB	VB	VIB	VIIB	VIIIB	VIIIB	VIIIB	IB	IIB	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

Some Formula and Constants:

$$c = 2.998 \times 10^8 \text{ m.s}^{-1}$$
$$h = 6.626 \times 10^{-34} \text{ J.s}$$
$$N = 6.023 \times 10^{23} \text{ mol}^{-1}$$
$$1 \text{ nm} = 1 \times 10^{-9} \text{ m}$$

Question 1
10 Points

a. Give the **correct** number of **significant figures** for each of the following:

0.08524: _____   21.10: _____

b. Report the answer for the following operation to the **correct number** of **significant figures**:   23.46 – 1.101 = _____

c. When **58.6** is divided by 1.0×10^{-2}, the answer should be reported to ____ **significant digit(s)**.

d. How many **eggs** are there in exactly **9 dozen**? _____

Question 2
3 Points

Circle those of the following (**if any**) that have the **same number** of **protons** and **electrons**.

^{13}C $^{1}H^+$ $^{24}Mg^{2+}$ ^{9}Be $^{40}Ca^{2+}$ ^{4}He

Question 3
6 Points

A piece of copper has a volume of **0.5 L**. How **many atoms** does the sample contain?

No need to do the calculation – just set up the correct dimensional analysis conversions – **you may not need to fill in all the boxes**.

$1\ cm^3\ Cu = 8.8\ g\ Cu$	$1\ kg = 1000\ g$	$1\ L = 1000\ cm^3$
9.5×10^{21} atoms Cu = 1 g Cu		$1\ cm^3 = 1\ mL$

0.5 L × _____ × _____ × _____

Question 4
6 Points

How many protons, neutrons and electrons are there in $^{7}Li^+$

Protons:_____   Neutrons: _____   Electrons: _____

Question 5
4 Points

A certain element consists of **two** stable isotopes.

The first has an atomic mass of **121** amu and a percent natural abundance of **57.3%**.
The second has an atomic mass of **123** amu and a percent natural abundance of **42.7%**
Show Work

_____ **AMU**

Question 6
10 Points

Use the Periodic Table accompanying this exam to answer the following questions:

1. **Cr** is in **period** _____ and **group** _____.

2. The **symbol** for the lightest **alkali metal**. _____

3. Element **64** is a(n) _____

4. Group **VIIA** are collectively **known** as the: _____

Question 7
2 Points

Assuming that the distance is approximately the same. **Circle** the salt that has the **greatest** Coulombic **force** of **attraction?**

- Potassium chloride
- Calcium sulfide

- Magnesium oxide
- Aluminum phosphate

3 Points

Briefly justify your choice.

_____

_____

Question 8
8 Points

Give the correct **name** for each of the following ionic compounds.

a. NH_4OH _____

b. FeN _____

c. $Cu(ClO_4)_2$ _____

d. $Ca(HSO_4)_2$ _____

Question 9
9 Points

Give the correct **formula** for each of the following ionic compounds.

a. Iron(II) sulfite _____

b. Sodium phosphate _____

c. Calcium chlorate _____

Question 10
6 Points

Calculate the **mass percent** of **bromine** in **carbon tetrabromide**.

Show Work

[_____] **%**

Question 11 8 Points	How many **grams** of **oxygen** are present in **1.59 moles** of **dioxygen difluoride**? *Show Work*

$\underline{\hspace{3cm}}$ g

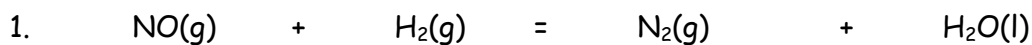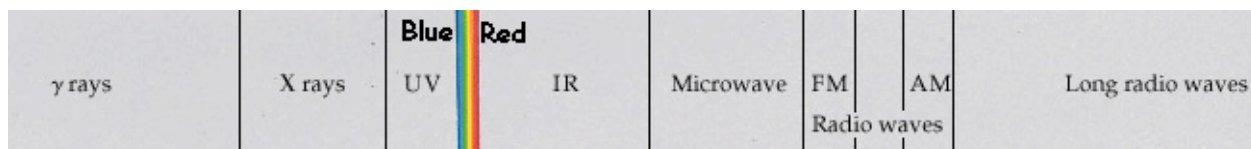|	
Question 12 6 Points	A compound is found to contain 30.45% nitrogen and 69.55% oxygen by weight and has a molar mass of **92.02** g/mol. What is the **formula** of this compound? *Show Work*

$\boxed{}$

Question 13 6 Points	Balance the following chemical equations using the **smallest** whole number integers possible.

1. $\underline{\hspace{1cm}}$ $NO(g)$ + $\underline{\hspace{1cm}}$ $H_2(g)$ = $\underline{\hspace{1cm}}$ $N_2(g)$ + $\underline{\hspace{1cm}}$ $H_2O(l)$

2. Phosphoric acid (H_3PO_4) + Potassium hydroxide = Potassium phosphate + water

Question 13 6 Points	

γ rays		X rays	**Blue** **Red** UV	IR	Microwave	FM	AM	Long radio waves
						Radio waves		

Circle the **correct answer** to each of the following:

a. The **one** with the **longest wavelength**:   X rays   IR   AM

b. The **one** with the **smallest frequency**:   Visible   UV   γ Rays

c. The **one** with the **greatest energy**:   IR   AM   FM

Question 14
7 Points

If your eyes receive a signal consisting of blue light, λ = **390nm**. Determine the energy in **J.mol^{-1}** of this light?

Show Work

$\boxed{}$ **J.mol^{-1}**

Exam I Score $\boxed{}$