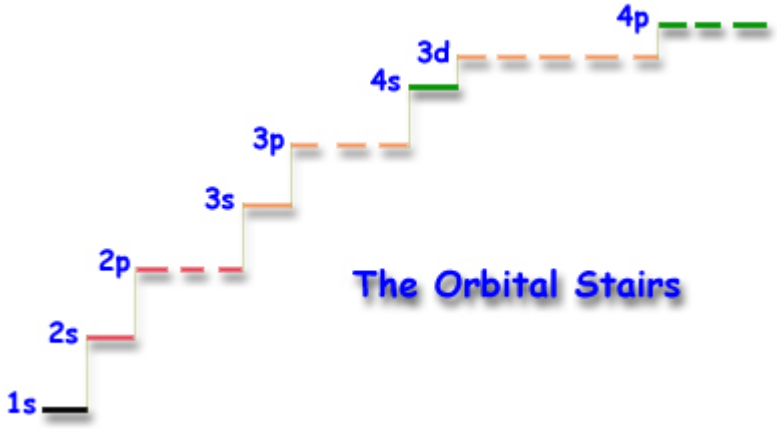
The Periodic Table

IA	IIA	IIIB	IVB	VB	VIB	VIIB	VIIIB	VIIIB	VIIIB	IB	IIB	IIIA	IVA	VA	VIA	VIIA	VIIIA
H 1 1.01																	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											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



SID | | | | | | | | | Last _____ First _____

Question 1 (4 Points) A chemist needs **2.12 g** of a liquid compound with a density of **0.784 g/cm^3**. What **volume** of the compound is required?

_____ **cm^3**

Question 2 (3 Points) How many significant figures are in the following number: **0.00546**

_____

Question 3 (4 Points) Carry out the following calculation and report the answer in the correct number of significant figures.

16.8(23.51 – 2.3)

_____

Question 4 (8 Points) Give the correct **formula** for the following **polyatomic ions**:

1. **Cyanide** _____
2. **Nitride** _____
3. **Nitrite** _____
4. **Nitrate** _____

Question 5 (6 Points) How many protons, neutrons and electrons are there in $^{81}Br^-$?

_____ **Protons** _____ **Neutrons** _____ **Electrons**

Question 6 (3 Points) Chlorine has two isotopes, ^{35}Cl and ^{37}Cl. What would you estimate the **relative abundance** of ^{37}Cl to be? [**Circle the best estimate**]

1. **100%**
2. **50%**
3. **25%**
4. **0%**

Question 7 (4 Points) Copper has two naturally occurring isomers:

	Exact Mass (amu)	Abundance
$^{63}_{29}Cu$	62.9296	69.17
$^{65}_{29}Cu$	64.9278	30.83

What is the **average atomic mass** of **copper**? Give answer to **4 decimal places**

_____

Question 8 (8 Points) The following questions pertain to the periodic table given at the front of this exam:

a. Element **29** belongs to which **group**? _____

b. Element **29** is one of the _____ **metals**.

c. The **symbol** for the **lightest Halogen** is? _____

d. How many **diatomic elements** are in **period 2**. _____

Question 9
8 Points

1. **Name** the compound with the formula **$AlPO_4$**? _____
2. **Name** the compound with the formula **$Co(NO_2)_2$**? _____
3. What is the **formula** for **magnesium carbonate**? _____
4. What is the **formula** for **iron(II) hydroxide**? _____

Question 10
6 Points

a. How many **moles** of **lead(II) chloride**, $PbCl_2$, are present in a sample that contains **4.96** moles of chloride ions?

_____ **moles $PbCl_2$**

b. How many **grams** of **lead(II) chloride** are present in **2.36** moles of $PbCl_2$?

_____ **grams $PbCl_2$**

Question 11
4 Points

How many **grams** on **Mg^{2+}** are present in **2.86** moles of **$Mg_3(PO_4)_2$** ?

_____ **grams of Mg^{2+}**

Question 12
6 Points

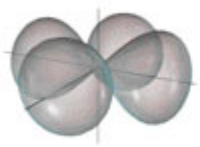
Balance the following chemical equations using the **smallest possible integer coefficients**.

1. ___ Fe_2O_3 + ___ $C(s)$ = ___ $Fe(s)$ + ___ $CO_2(g)$
2. ___ $Cl_2(g)$ + ___ $NaI(s)$ = ___ $NaCl(s)$ + ___ $I_2(s)$
3. **Hydrogen bromide** (HBr) undergoes decomposition to produce **hydrogen** gas and liquid **bromine**.

_____

Question 13
8 Points

Label the following orbital drawings as **s**, **p**, **d** or **f**.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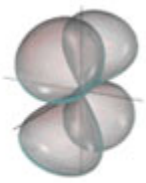
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Question 14 (10 Points)

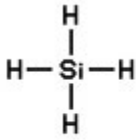
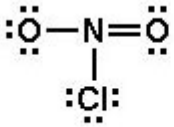
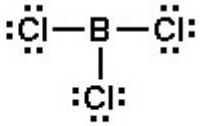
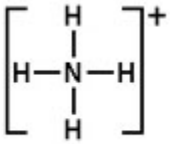
1. Write the **complete** electronic configuration for **nitrogen**? _____
2. Write the **noble gas** configuration for **cobalt,** (Co)? _____
3. The element with an electron configuration of $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^1$ _____
4. **Bromine**, $[Ar]4s^2 3d^{10} 4p^5$, has how many **valence electrons**? _____
5. The element in period **6** that has the Lewis diagram, X: _____

Question 15 (6 Points)

1. **Br**, **K**, **Ca** or **Se**. The one with the largest atomic radius: _____
2. **I**, **At**, **Br** or **Cl**. The one with the smallest ionization energy: _____
3. **Sr**, **Ca**, **Ba** or **Mg**. The most electronegative one: _____

Question 16 (6 Points)

From the Lewis structures of the species given, **pick all** of those in which the **central atom obeys** the **octet rule**.

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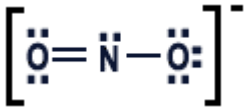
Question 17 (6 Points)

To answer the questions, interpret the following Lewis diagram for NO_2^-.



With respect to the **central nitrogen atom**:

1. The number of **lone pairs** = _____
2. The number of **single** bonds = _____
3. The number of **double** bonds = _____

Exam I Score ☐