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)									

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

Information You May Need:

100 cm = 1 m

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

Question 1
4 Points

Do Not Write Here

A field is found to have an area of **1,000 m^2**.
Using unit analysis, show what the area of the field is in **cm^2**.

$$\frac{1{,}000\ m^2}{} \left| \begin{array}{l} \frac{100\ m}{1\ cm} \\ \end{array} \right. \left| \begin{array}{l} \frac{100\ m}{1cm} \\ \end{array} \right. = 1 \times 10^7\ cm^2$$

Question 2
8 Points

A nucleus has 34 protons and 43 neutrons
Fill in the three blanks to complete the atomic symbol.

77
Se
34

How many electrons does this atom possess? 34

Question 3
4 Point

What is the charge (both magnitude and sign) of the ions formed from the following atoms?

1. Potassium +1
2. Aluminum +3
3. Se -2
4. Be +2

Question 4
12 Points

Give the correct chemical formula and charge for the following polyatomic ions.

1. Cyanide CN^-
2. Chlorate ClO_3^-
3. Nitrate NO_3^-
4. Sulfite SO_3^{2-}
5. Carbonate CO_3^{2-}
6. Ammonium NH_4^+

Question 5
6 Points

Do Not Write Here

1. Alkali Metal
2. Transition Metal
3. Noble Gas
4. Non Metal
5. Halide
6. Alkali Earth Metal
7. Metalloid

Use the numbering scheme on the left to give the best classifications for the following elements. (i.e. Na, 1)

a. Fe 2
b. Xe 3
c. Be 6
d. S 4
e. K 1
f. F 5

Question 6
9 Points

Give the correct chemical name for the following ionic compounds.

1. $CuNO_2$ Copper(I) nitrite
2. NH_4OH Ammonium hydroxide
3. Al_2O_3 Aluminum oxide

Question 7
8 Points

Give the correct name or formula for the following covalent compounds.

1. SO_3 — Sulfur trioxide
2. Dinitrogen tetraoxide — N_2O_4
3. Boron trifluoride — BF_3
4. CF_4 — Carbon tetrafluoride

Question 8
4 Points

The balanced chemical equation for the reaction between glucose and oxygen is

$$C_6H_{12}O_6(s) + 6O_2(g) = 6\ CO_2(g) + 6\ H_2O(l)$$

We can interpret this to mean that 6 moles of oxygen and 1 mole of $C_6H_{12}O_6$ react to produce 6 moles of water and 6 moles of carbon dioxide

Question 9
9 Points

When the following chemical equations are balanced using the smallest possible integer coefficients, the values of these coefficients are:

1. $CH_4\ (g) + 2\ O_2(g) = CO_2(g) + 2\ H_2O(l)$
2. $4\ Fe(s) + 3\ CO_2(g) = 2\ Fe_2O_3(s) + 3\ C(s)$
3. $2\ CH_3OH\ (g) + 3\ O_2(g) = 2\ CO_2(g) + 4\ H_2O(l)$

Question 10
(6 Points)

What is the percent by weight of **carbon** in **$C_6H_{12}O_6$** ?

Do Not Write Here

Molar Mass: $6(12.01)+12(1.01)+6(16.00) = 180.18g$

Carbon: $6(12.01) = 72.06\ g$

$\%\ C = (72.06/180.18)x100 = 39.99\%$

Ans: 39.99%

Question 11
(6 Points)

How many **GRAMS** of **iron(II) chloride** are present in **0.48** moles of this compound ?

Do Not Write Here

Molar Mass $FeCl_2 = 55.85 + 2(35.45) = 126.75$

$$\frac{0.48\ \text{mol}\ FeCl_2}{1\ \text{mol}} \left| \frac{126.75\ g}{} \right. = 60.98g\ FeCl_2$$

Ans: 60.84g

SID: | | | | | | | | | **Last:** _____ **First:** _____

Question 12
(10 Points)

How many **GRAMS** of **nitrogen** are present in **72.6 grams** of **dinitrogen tetrafluoride** ?

Molar Mass N_2F_4 = 2(14.01) + 4(19.00) = 104.02g

$$\frac{72.6\ g\ N_2F_4}{\frac{1\ mol}{104.02g}} = 0.698\ mol\ N_2F_4$$

$$\frac{0.698\ mol\ N_2F_4}{\frac{2\ N}{1\ N_2F_4}} = 1.396\ mol\ N$$

$$\frac{1.396\ mol\ N}{\frac{14.01g}{1\ mol}} = 19.56g\ N$$

Ans: 19.56g

Do Not Write Here

Question 13
(6 Points)

A compound is found to contain **10.85 % silicon**, **27.40 % chlorine**, and **61.75 bromine** % by weight. What is the empirical formula for this compound?

Si	Cl	Br
10.85%	27.40%	61.75%
10.85g	27.40g	61.75g
0.386 mol	0.773 mol	0.773 mol
$\frac{0.386\ mol}{0.386\ mol}$	$\frac{0.773 mol}{0.386\ mol}$	$\frac{0.773\ mol}{0.386\ mol}$
1	2	2

Empirical formula: $SiCl_2Br_2$

Question 14
4 Points

Of the following three salts circle one that you might expect to be soluble in water?

CaO NaF Al_2S_3

Question 15
4 Points

A compound is found to contain 22.32% Vanadium (element #23) and 77.68% chlorine. What is the charge on the Vanadium atom?

V	Cl
22.32%	77.68%
22.32g	22.32g
0.438 mol	2.191 mol
$\frac{0.438 \text{ mol}}{0.438 \text{ mol}}$	$\frac{2.191 \text{ mol}}{0.438 \text{ mol}}$
1	5

Empirical Formula: VCl_5

Charge: +5

Score
