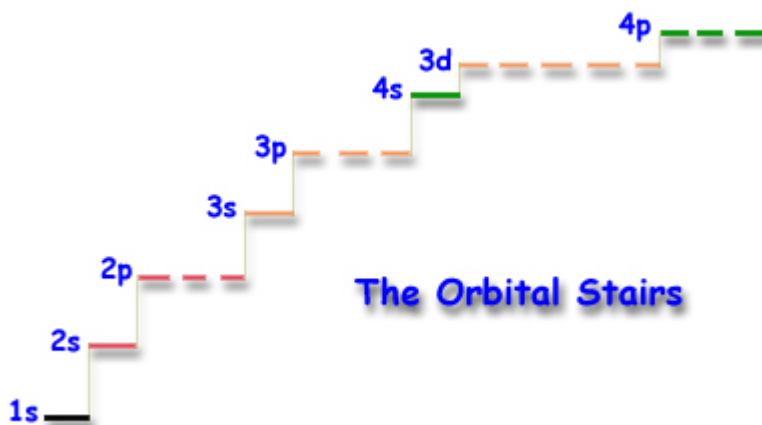


The Periodic Table

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	III B	IV B	V B	VI B	VII B	VIII B	VIII B	VIII B	VIII B	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 Useful (maybe) Constants:

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

SID

Last _____

First _____

Question 1

6 Points

Report the follow operations to the **correct** number of **significant figures**?

a) $36.456 + 74.2$ _____

b) $18.4 \times (1.000 \times 10^{-3})$ _____

c) $2.01(23.56 - 2.3)$ _____

Question 2

4 Points

A piece of **copper** has a volume of **740L**. What is the mass of the same in **units of grams**.

$1 \text{ cm}^3 \text{ Cu} = 8.8 \text{ g Cu}$

$1 \text{ kg} = 1000 \text{ g}$

$1 \text{ L} = 1000 \text{ cm}^3$

$9.5 \times 10^{21} \text{ atoms Cu} = 1 \text{ g Cu}$

$1 \text{ cm}^3 = 1 \text{ mL}$

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

$$740 \text{ L} \times \frac{\text{ }}{\text{ }} \times \frac{\text{ }}{\text{ }} \times \frac{\text{ }}{\text{ }}$$

Question 3

10 Points

Give the correct **formula** for the following **polyatomic ions**:a) **Phosphide** _____b) **Phosphate** _____c) **Sulfite** _____d) **Chromate** _____e) **Cyanide** _____**Question 4**

4 Points

Which of the following apply to the **electron**?

mass $\sim 9.109 \times 10^{-28} \text{ g}$

charge = -1

charge = 0

charge = +1

mass $\sim 1.673 \times 10^{-24} \text{ g}$

Question 5

8 Points

a) How many **protons** and **neutrons** are there in the nucleus of an atom that has an **atomic number of 83** and a **mass number of 214**?

Protons: _____

Neutrons: _____

b) What is the **symbol** for the **element**?

Symbol: _____

c) The atom bears a charge of **+3**, then number of **electrons** is: _____

Question 6

8 Points

The following questions pertain to the **periodic table** given at the front of this exam:

- a. The **atomic weight** of the element in **group 6A** and **period 3**? _____
- b. What is the **name** of the **halogen** that is in **period 3**? _____
- c. The **symbol** for the **lightest alkali metal** is? _____
- d. **Circle** any of the following that are **main group elements**? (Z = atomic number)

Sc (Z=21)

Te (Z=52)

V (Z=23)

Cs (Z=55)

Question 7

10 Points

- a. **Name** the compound with the formula $\text{Ca}(\text{NO}_2)_2$? _____
- b. **Name** the compound with the formula $\text{Cu}(\text{ClO}_4)_2$? _____
- c. What is the **formula** for **sodium phosphide**? _____
- d. What is the **formula** for **iron(III) sulfate**? _____
- e. What is the **formula** for **ammonium hydroxide**? _____

Question 8

4 Points

A certain element consists of two stable isotopes:

	Exact Mass (amu)	Abundance (%)
#1	106.9051	51.82
#2	108.9047	48.18

What is the atomic weight of this element?

Give answer to 4 decimal places.Show Work amu**Question 9**

4 Points

How many **moles** of boron trifluoride, BF_3 , are present in a sample that contains **7.95 moles of fluorine atoms**?Show Work moles

Question 10

6 Points

How many moles of copper(II) hydroxide are present in 4.44 grams of this compound?

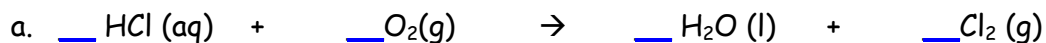
Show Work

moles

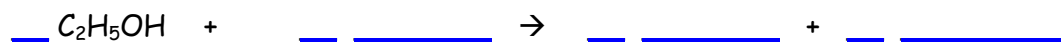
Question 11

6 Points

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



b. Write a **balanced equation** for the **complete oxidation** reaction that occurs when ethanol (C₂H₅OH) burns in air.

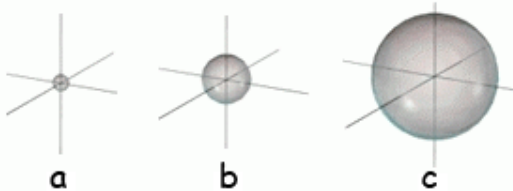


c. Write a **balanced equation** for the reaction of **nitrogen gas** with **hydrogen gas** to produce **ammonia** (NH₃)



Question 12

6 Points



- a) The orbitals depicted above are **what type**? _____
- b) Which orbital would have the **highest ionization energy**? _____
- c) Which orbital would possess the **smallest force of attraction**? _____

Question 13

4 Points

- a) **How many 4d orbitals** are there in an atom? _____
- b) What is the **maximum number of electrons** in a set of **3p orbitals**? _____

Question 14

12 Points

- a) Write the electron configuration for the **magnesium atom**. _____
- b) Write the **noble gas configuration** for **iron, (Fe)**? _____
- c) The **element** with an **electron configuration** of **1s²2s²2p⁶3s²3p⁶4s¹3d¹⁰** _____
- d) **Xe, [Kr]5s²4d¹⁰5p⁶**, has how many **valence electrons**? _____
- e) The **element in period 4** that has the **Lewis diagram**, _____
- f) **X is a Main Group element in period 3 with 4 valence electrons**. X is: _____

Question 15

4 Points

Using only the periodic table **arrange** the following elements in order of **increasing atomic radius**: **Na, N, K, P**

Smallest

Largest

Question 16

4 Points

Using only the periodic table **arrange** the following elements in order of **decreasing ionization energy**: **As, Cl, Ge, P**

Highest

Lowest

Exam I Score