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

Some Formula and Constants:

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

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

Question 1
10 Points

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

180: _____ 2.30×10^{-3}: _____

b. Report the answer for the following operation to the **correct number** of **significant figures**: 23.46 – 1.1 = _____

c. When **58.6** is divided by **77.31**, the answer should be reported to ____ **significant digit(s)**.

d. How many **hours** are there in exactly **26 days**? _____

Question 2
6 Points

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

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

Question 3
6 Points

A piece of copper contains **5.4×10^{8}** atoms. What is the **mass** of the sample in **kilograms?**

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

5.4×10^{8} atoms **x** _____ **x** _____ **x** _____

Question 4
6 Points

How many protons, neutrons and electrons are there in $^{81}Br^-$

Protons:_____ Neutrons: _____ Electrons: _____

Question 5
4 Points

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%**
Show Work

_____ **AMU**

Question 6 (10 Points)

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

1. **Formula** for the only **diatomic** in **Period 3** _____
2. **Symbol** for the **heaviest Alkali Earth** element. _____
3. **Symbol** for **transition metal** in **Group IB**, **Period 4**. _____
4. **Plutonium** (Pu) is a: (**metal**, **nonmetal**, **metalloid**) _____
5. Group **IA** are collectively **known** as the: _____

Question 7 (2 Points)

Circle the salt that has the **greatest** Coulombic **force** of **attraction**?

NaCl CsCl KCl LiCl

(3 Points)

Briefly justify your choice.

_____

_____

Question 8 (8 Points)

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

a. NH_4OH _____ c. $Cu(ClO_2)_2$ _____

b. FeS _____ d. $CaSO_3$ _____

Question 9 (9 Points)

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

a. Copper(II) nitrite _____

b. Sodium nitride _____

c. Calcium hydrogen carbonate _____

Question 10 (6 Points)

Calculate the **mass percent** of **oxygen** in **dinitrogen tetraoxide**.

Show Work

%

Question 11
6 Points

How many **ATOMS** of **nitrogen** are present in **2.56 moles** of **dinitrogen oxide?**
Show Work

atoms of N

Question 12
6 Points

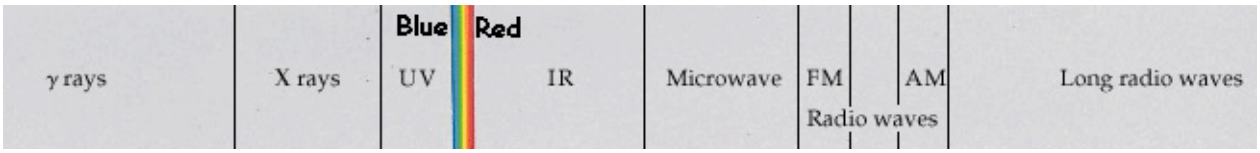
A **hydrocarbon** is a compound composed **purely** of **hydrogen** and **carbon**. If a particular hydrocarbon is found to be composed of **89.93% C** and has a molar mass of **120.21** g/mol. What is the **formula** of this hydrocarbon?

Question 13
6 Points

Balance the following chemical equations using the **smallest** whole number integers possible.

1. ____ $C_4H_{10}(g)$ + ____ $O_2(g)$ = ____ $CO_2(g)$ + ____ $H_2O(l)$
2. Sulfuric acid (H_2SO_4) + Potassium hydroxide = Potassium sulfate + water

Question 13
6 Points



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

a.	The **one** with the **shortest wavelength**:	X rays	IR	AM
b.	The **one** with the **highest frequency**:	Visible	UV	γ Rays
c.	The **one** with the **smallest energy**:	IR	AM	FM

Question 14
6 Points

If your eyes receive a signal consisting of blue light, λ = **4.66×10^{-7}m**. Determine the energy in **J.mol^{-1}** of this light?

J.mol^{-1}

Do Not Write Below This

Exam I Score