

Question 1
4 Points

Give the **complete** electronic configuration for the following:

- a. Cl $1s^2 2s^2 2p^6 3s^2 3p^5$ b. Ga $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^1$

Question 2
8 Points

Give the **noble gas** configuration for the following

- a. Br $[Ar]4s^2 3d^{10} 4p^5$ c. Cu $[Ar]4s^1 3d^{10}$
b. Fe^{2+} $[Ar]3d^6$ d. F^- $[He]2s^2 2p^6$ or $[Ne]$

Question 3
6 Points

How many **valence electrons** do the following atoms possess?

- a. Al^{3+} 8 b. Ne 8 c. Cu 11

Question 4
4 Points

How many **diamagnetic** elements are there in period 6? 4

Question 5
5 Points

Arrange the following elements in order of **increasing ionization energy**, by ranking them from 1 (**smallest**) to 5 (**greatest**)

Ca	3	Ge	4
Rb	1	Sr	2
P	5		

Question 6
5 Points

I belong to the **3rd period** on the Periodic Table. I am **less metallic** than **magnesium**, **less electronegative** than **phosphorous**, and I am **smaller** than **silicon**.

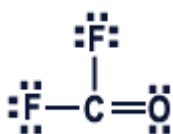
Who am I?

Al (Symbol)

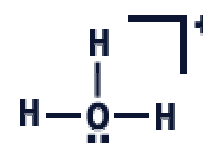
Question 7
16 Points

Draw the **best** Lewis Dot structure for the following

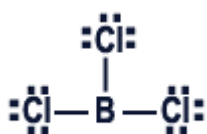
F_2CO



H_3O^+



BCl_3



XeF_4



Question 8

10 Points
(6 Points)Draw all reasonable resonance structure for FNO_2 .

Circle the correct answer:

Average bond length table is on the front page of this exam.

(4 Points)

The F to N bond length is expected to be:

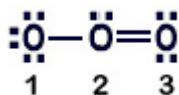
1. > 134 pm
2. < 134 pm
3. = 134 pm

The N to O bond length is expected to be:

1. = 136 pm
2. > 136 pm
3. = 115 pm
4. > 115 pm

Question 9

6 Points

A Lewis structure for ozone, O_3 is depicted below:

Give the formal charge on each of the oxygen atoms.

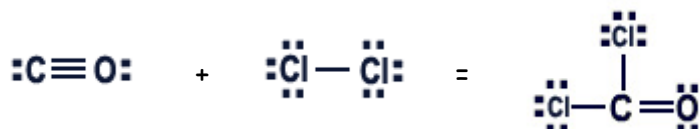
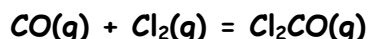
O1: -1

O2: +1

O3: 0

Question 10

5 Points

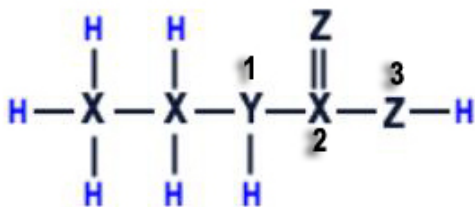
Phosgene, Cl_2CO is a highly toxic gas. Using the *bond energies given on the front page* of this exam, estimate the enthalpy change for the reaction of carbon monoxide and chlorine to produce phosgene.

$$\text{C}\equiv\text{O} + \text{Cl}-\text{Cl} - \{ 2(\text{C}-\text{Cl}) + \text{C}=\text{O} \}$$

$$1075 + 243 - \{ 2(330) + 745 \} = -87 \text{ kJ/mol}$$

Question 11

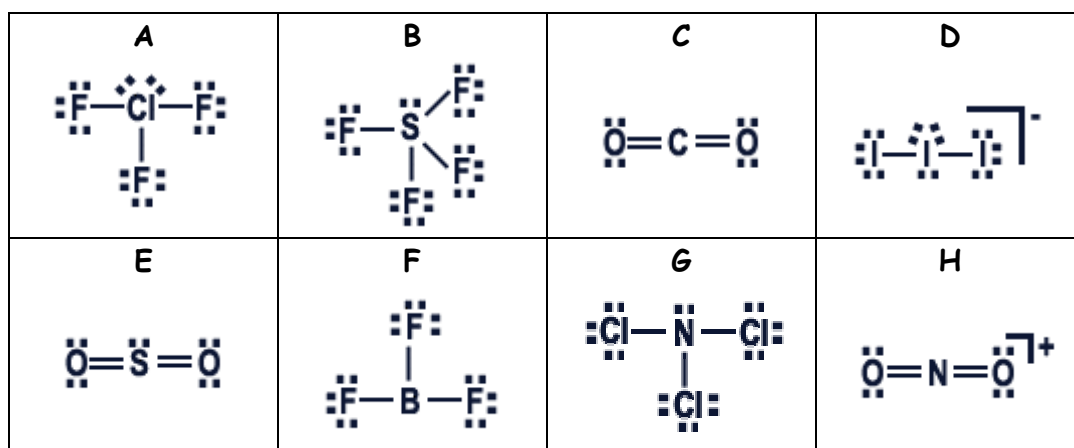
9 Points

A hypothetical organic molecule is depicted on the left. H is hydrogen and X, Y and Z are **period 2** elements. The following questions pertain to this molecule

- a. The **bond angle** around: 1: ~109 2: 120 3: ~109
- b. The **symbol** for: X: C Y: N Z: O
- c. The **number** of lone pairs in this molecule: 5

Question 12
22 Points

The following questions refer to the molecules depicted below.



- List the **structure(s)** whose **only** bond angle is $\sim 180^\circ$ C, D, H
- List the **structure(s)** whose **epg** is/are **linear**: C, H
- Give the **electron pair geometry (epg)** for:

A: Trigonal bipyramid	E: Trigonal planar
G: Tetrahedron	
- Give the **molecular geometry** for:

B: Seesaw	F: Trigonal planar
G: Trigonal pyramid	
- Label the following molecules as either **polar (P)** or **non polar (NP)**

C: NP	D: NP	H: NP
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Do Not Write Below This

Exam II Score