Question 1
4 Points

Give the complete electronic configuration for the following:

1 C

2. Br $1s^22s^22p^63s^23p^64s^23d^{10}4p^5$

Question 2

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

8 Points

```
1. Rb [Kr]5s<sup>1</sup>
```

Question 3
6 Points

List the **Period 4** elements that are **diamagnetic**:

Question 4
5 Points

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

P 2	Ga 3	S 1
Ca 4	Cs 5	

Question 5
5 Points

Arrange the following elements in order of electronegativity, by ranking then from 1 (least) to 5 (greatest)



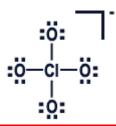
Question 6
10 Points

Draw the <u>best</u> Lewis Dot structure for the following

 $\ddot{0} = \ddot{0}$

O₂





BF₃

CO2

Question 7

The following questions all relate to NO2

6 Points

(4 Points)

1. The molecule has **two** resonance structure. Draw them.

(2 Points)

2. The N to O bond length in pm is best described as:

(Circle the best choice)

$$a) = 136$$

Question 8 4 Points

The **formal charge** on the carbon and nitrogen atoms in CN^- are:

N: 0

Question 9 6 Points

Methane when combusted produces carbon dioxide and water according to:

$$2 CO(g) + O_2(g) = 2 CO_2(g)$$

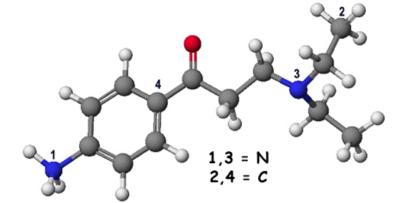
Estimate the amount of energy produced upon the combustion of 1 mole of CO?

$$\ddot{0} = \dot{0}$$

$$2(C\equiv O) + O=O - 4(C=O)$$

2(1075) + 498 - 4(803) = -564/2 kJ

Question 10 4 Points



What is the **bond angle** about the numbered atoms?

- 1. 109
- 2. 109
- 3. 109
- 4. 120

Question 11 34 Points

The following question A	В	C	D
:ċi- :ċi-B-ċi:	: <u>F</u> — <u>S</u> — <u>F</u> :	:FXE	H—C≡N:
E	F	G	Н
:F.—S.—F.: \F.: :F.:	:Br—i,—Br:	: <u>F</u> —ci—F: - :F:	:0: н—с—н

- 1. List the structure(s) whose only bond angle is ~180°
- D, F
- 2. List the structures(s) whose epg is/are trigonal planar:
- A, H

- 3. Give the electron pair geometry (epg) for:
 - B: Tetrahedron

C: Octahedron

F: Trigonal bipyramid

- G: Trigonal bipyramid
- 4. Give the molecular geometry for:
 - B: Angular (109)

C: Square planar

E: See-saw

- G: T-shaped
- 5. Label the following molecules as either polar (P) or non polar (NP)
 - A: NP
- B: P
- C: NP
- D: P
- F: NP

Question 12 4 Points

A hypothetical molecule has the formula AB_3C_2 , where A is the central atom and B and C are elements belonging to the same group. The molecule has a trigonal bipyramid electon pair geometry and is polar. What could you infer about the atomic weight of C versus that of B?

(1 Point)

Atomic weight of C > B

In three sentences or less justify your reasoning.

(3 Points)

In a trigonal bipyramid geometry, the larger molecules prefer the trigonal planar area. If B were the largest, then they would occupy this area and the molecule would be

Non-polar. The fact that its polar means that the C's occupy the trigonal planar area.

Question 13 4 Points	The order (most soluble to least soluble) of solubility in water for the following molecules is:		
	$NH_3 > CO_2 > O_2$		
(2 Points)	What would you anticipate the order to be (most soluble to least soluble) in carbon tetrachloride, CCl_4		
	$O_2 > CO_2 > NH_3$		
(2 Points)	In two sentences or less, justify your choice. Solubility - Like dissolves in like. The order given is in water (polar solvent). CCl4		
	is a non-polar solvent, thus the solubility would be reversed.		

Do Not Write Below This Line

	_	_
Exam II Score		