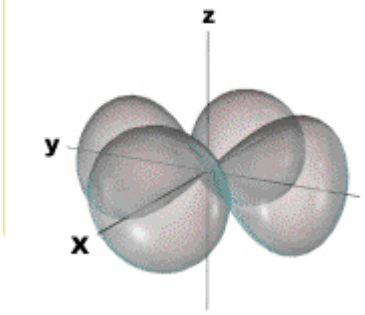
Question 1
6 Points

Do Not Write Here



Circle the correct answers to the following questions, which relate to the orbital depicted on the left.

1. The orbital depicted is an **s, p, d, f or g** orbital.
2. The principal quantum number for this orbital cannot be: **2** **3** **4**
3. The likely specific designation for this orbital:

   $2s$, $3s$, $2p_x$, $2p_y$, $2p_z$, $3p_x$, $3p_y$, $3p_z$, $2d_{xy}$, $2d_{xz}$, $2d_{yz}$, $2d_{z2}$, $2d_{x2-y2}$, $3d_{xy}$, $3d_{xz}$, $3d_{yz}$, $3d_{z2}$, $3d_{x2-y2}$

Question 2
18 Points

Do Not Write Here

1. Write the complete electronic configuration for the following:

   Sodium atom $1s^2 2s^2 2p^6 3s^1$ **Oxide** ion $1s^2 2s^2 2p^6$

2. What is the valence electron configuration for:

   Phosphorus atom $3s^2 3p^3$ **Bromide** ion $4s^2 4p^6$

3. How many valence electrons do the following have:

   Zenon (Xe) 8 Li^+ 2

4. A main group element with the valence electron configuration $3s^2 3p^4$ is in periodic group **VIA**. It forms a monatomic ion with a charge of **-2**. The symbol for this element is **S**.

Question 3
6 Points

Label the following atom/ions as either paramagnetic (P) or diamagnetic (D):

1. Be **D** 2. C **P** 3. F^- **D**

Question 4
8 Points

Do Not Write Here

With respect to the elements, **Rb**, **Cs**, **K** and **Na**:

A. Which element would you expect to have the smallest atomic radius? **Na**

B. Which element would you expect to be most metallic? **Cs**

C. Which element would you expect to have the largest ionization energy? **Na**

D. Which element would you expect to be least electronegative? **Cs**

Question 5
8 Points

Do Not Write Here

With respect to the elements, **B**, **Li**, **Be** and ***C***:

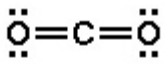
A. Which element would you expect to have the smallest atomic radius? ***C***

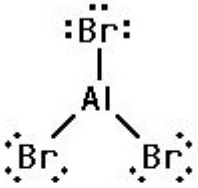
B. Which element would you expect to be most metallic? **Li**

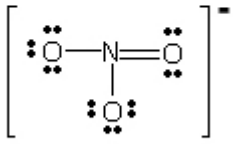
C. Which element would you expect to have the smallest ionization energy? **Li**

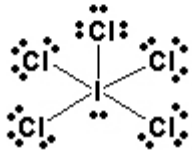
D. Which element would you expect to be most electronegative? ***C***

Question 6
12 Points

a) 

b) 

c) 

d) 

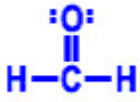
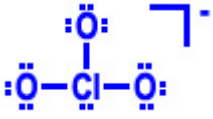
With respect to the Lewis Dot Structures depicted on the left: **(Circle the correct letter)**

1. Identify all whose central atom obeys the octet rule.
   a **b** **c** **d**
2. Identify all whose central atom has more than an octet. **a** **b** **c** **d**
3. Identify the structure whose central atom has the greatest number of bond pair electrons.
   a **b** **c** **d**
4. Identify the structure that has the least number of lone pair electrons. **a** **b** **c** **d**
5. Identify the structure(s) that have resonance structures. **a** **b** **c** **d**
   I also accepted answer a.

Question 7
16 Points

Do Not Write Here

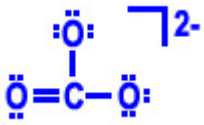
Draw the Lewis Dot Structure for each of the following molecules:

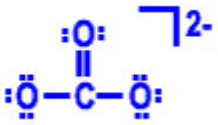
NHF_2 	**H_2CO** 
ClO_3^- 	**BF_3** 

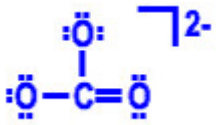
SID: | | | | | | | | | Last: _____ First: _____

Question 8
9 Points

Draw the three resonance structures for CO_3^{2-}.







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Question 10
5 Points

The anticipated Carbon to Oxygen bond length in CO_3^{2-} is: (check the correct answer)

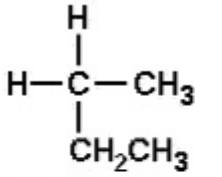
_____143pm _____**between 143pm and 122pm** _____122 pm

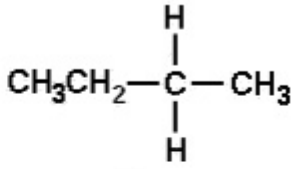
_____between 122pm and 113pm _____113pm

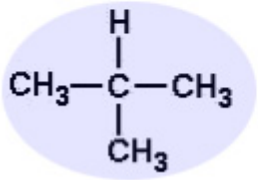
Question 11
12 Points

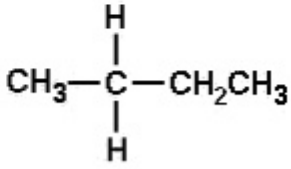
Give the correct name for the following straight chain alkane,

$CH_3CH_2CH_2CH_2CH_2\ CH_2CH_2CH_3$ **Octane**









Three of the structures depicted on the left represent the same molecule. Circle the structure that does not match the others

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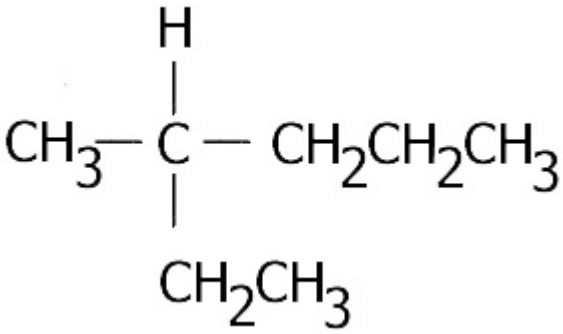

Fill in the missing portions of the correct name given below for the molecule depicted on the left.

3-methyl**hex**ane

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