

Problem Set 3 – Due by 5 p.m. on Monday, 9/30/19

Please answer the following questions on a separate sheet (or sheets) of paper.

- The following questions relate to CNO^- .
 - Please draw **structures for at least two different atom arrangements** (using two different central atoms). Indicate the formal charges on all atoms in your structures.
 - Based on your structures in (a), **which do you expect to be the central atom** in this ion? Explain briefly.
 - Given the atom arrangement selected in (b), which resonance structure gives the **most reasonable depiction of bonding**? Explain briefly.
- Please draw the **best Lewis structure** for each of the following, **obeying the octet rule** wherever possible. Include equivalent resonance structures, if necessary. Then, use VSEPR Theory to **name and sketch the molecular geometry** and **estimate the bond angles**.
 - ICl_2^-
 - PO_4^{3-}
 - XeO_3
 - BrCl_5 (bromine pentachloride)
- Please reconsider parts (b) and (c) in Problem 2 above. This time, draw the **best Lewis structure(s)** for each that **minimize formal charges**. Again, please include equivalent resonance structures, if appropriate.
- Please answer the following questions **for each molecule or ion in Problem 2** above:
 - Is it **polar**?
 - What type of **hybrid orbitals** does the central atom use?