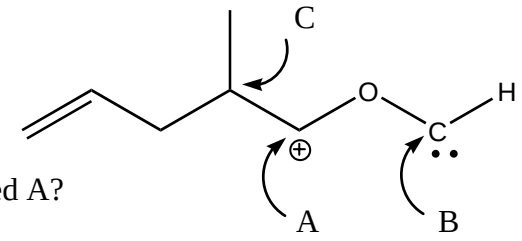
CHEm3411 fall 2005 test 1 Name: _____

I. Consider the structure shown and answer each question. 3 pts each, 15 pts total



1. How many total carbons are in the compound?

   7

2. How many hydrogens are attached at the position labeled A?

   1

3. How many lone pairs of electrons are on the atom labeled A?

   0

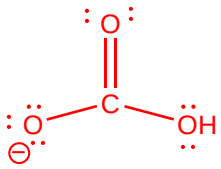
4. What is the formal charge on the atom labeled B (note the lone pair)?

   0

5. Classify the position labeled C as methyl, primary, secondary, tertiary, or quaternary (circle one)

II. Draw a Kekule/Lewis structure of the bicarbonate ion (HCO_3^-) showing all bonds, non-zero formal charges, and lone pairs. Note- this compound is not a peroxide. 5 pts

this is homework problem 1.10e

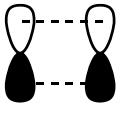


III. Answer each of the following. Best 2 count 4 points each, 8 pts total, try all for bonus.

1. A compound has 2 bonding and 2 antibonding molecular orbitals. If these orbitals are occupied with 8 electrons, what is the bond order?

   0

2. Which of the following types of bonds will result from the overlap of the orbitals A and B as shown?



   sigma bonding sigma antibonding pi bonding pi antibonding

3. Draw the Lewis/Kekule structure of a compound with exactly 1 carbon that will be sp hybridized. You may use any other atoms you wish.

   several answers are possible- here are 2 possible ones