Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 1 pt

|  |  |  |
| --- | --- | --- |
| \_\_\_\_\_/60Ch 1,2,4 | \_\_\_\_\_/40Ch 3 | \_\_\_\_\_/100Total |

Note: Electron pairs might not be shown. Formal charges are 0 unless indicated.

1. Consider the four compounds below:

 **A B C D**

 .. .. .. .. .. .. .. ..

 :O=N=CH2 :O-N=CH2 :O-N-CH2 :O=N-CH2

 ..

1. Which compound(s) if any contain positively charged O? \_\_\_\_\_\_\_\_
2. Which compounds(s) if any contain negative N? \_\_\_\_\_\_\_\_\_
3. Which compound(s) if any contain positive C ? \_\_\_\_\_\_\_\_\_
4. Which compound(s) if any contain positive N \_\_\_\_\_\_\_\_\_
5. Draw all the neutral organic structures that obey Lewis rules (and HONC rules) with the formula:

 C3H5O (2 pts)

1. Carbon dioxide can satisfy the Lewis octet rule in two ways as shown below. Circle the more stable

 version and briefly explain the reason for your choice. (2 pts)

 .. .. .. ..

 : O=C=O: :O-C≡O

 **..**

1. Based on the HONC rules, can the molecular formula C2H2O exist as organic chemical ?

 YES no

 If yes, draw a likely structure**.**

1. For the molecular shapes below, predict the most likely direction of dipole **( + - )**





\_\_\_\_\_\_\_/12

1. Determine the hybridization of the atoms indicated with each of the molecules below:

1. N \_\_\_\_\_\_ b) O\_\_\_\_\_\_\_ c) N \_\_\_\_\_\_\_\_ d) O \_\_\_\_\_\_\_\_ e) C \_\_\_\_\_\_\_\_\_\_











1. Draw all the constitutional isomers of the formula C6H14. (4 pts)
2. Circle where the lone pairs live in the compounds below and indicate their hybridization. (4 pts)





Hybridization(s)

1. Draw the equivalent abbreviated bond line structures for the condensed structures below: (4 pts)
2. (CH3)3CH2CH2CH(CH3)2
3. (CH3)2CHCH2CH2OH
4. Identify the functional groups represented by:









\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Draw specific examples of the functional groups:

a) amide b) amine c) ester d)acid chloride

\_\_/25

1. Provide the IUPAC name for the compounds below: (3 pts each)









1. Draw the structures named below: (3 pts each)

1-cyclohexyl-4-(1methylethyl)octane 3-isopropylbicyclo[3.2.0]heptane

A



C

D

B

1. ID the position where the butane structure is anti \_\_\_\_\_\_
2. ID the position where the butane structure is gauche \_\_\_\_\_



c) Which position are the methyls on C2 and C3 of butane eclipsing each other? \_\_\_\_\_

d) USing the Neuman projection template to the right, draw the structure associated

 with an anti butane configuration. (2 pts)

\_\_\_/17

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |
| --- |
| \_\_\_\_\_/40Ch 3 |

1. Draw the conjugate base of: (2 pt)



1. Draw the conjugate acid of: (2 pt)



1. Draw a resonance structure for the following compound: (2 pt)

#

1. Draw mechanistic (curved) arrows to show the following resonance structures. (2 pt)



1. Given the pKa of the following acids, explain which side the reaction is favored and why. (4 pt)



1. Circle the most acidic **proton** in the compound. (4 pt)



1. Circle the more stable anion and Explain why. If the reasoning is resonance, draw the resonance structure. (6 pt)



1. Circle the more acidic compound and Explain why. If the reasoning is resonance, draw the resonance structure. (9 pt)



1. For each reaction below, draw a mechanism (curved arrows), circle the stronger acid, and predict which side of the reaction is favored under equilibrium conditions (Left or Right). Explain why you chose the sronger acid. (5 pt)



1. Show the mechanism for the reaction that takes place when you mix the hydroxide anion with the following compound, as well as the product. (4 pt)

