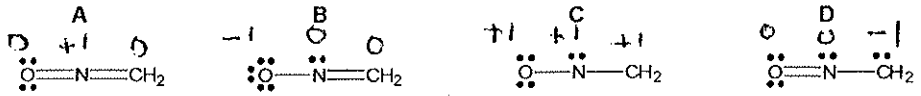
Organic Chemistry 1
Exam 1, Ch 1-4 Fall 2017

Name_____

____/60 Ch 1,2,4	____/40 Ch 3	____/100 Total

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

1. Consider the four compounds below: (4 pt)



a) Which compound(s) if any contain positively charged O? C

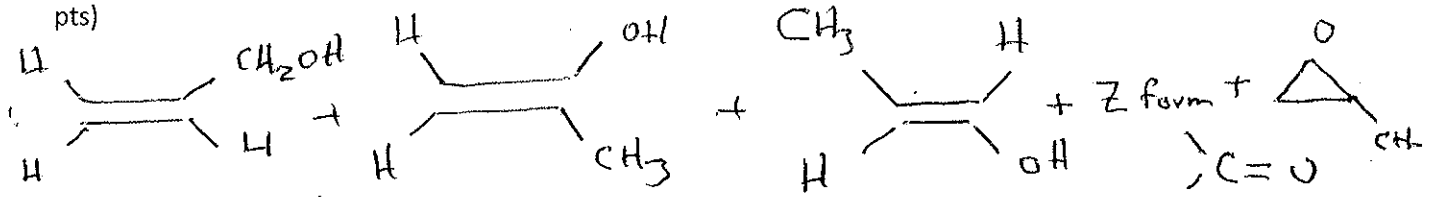
b) Which compounds(s) if any contain negative N? none

c) Which compound(s) if any contain positive C? C

d) Which compound(s) if any contain positive N? C, A

2. Draw all the neutral organic structures that obey Lewis rules (and HONC rules) with the formula: C_3H_6O (2 pts)

Any two of:

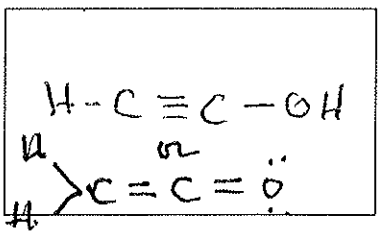


3. Carbon dioxide can satisfy the Lewis octet rule in two ways as shown below. Circle the more stable version and briefly explain the reason for your choice. (2 pts)

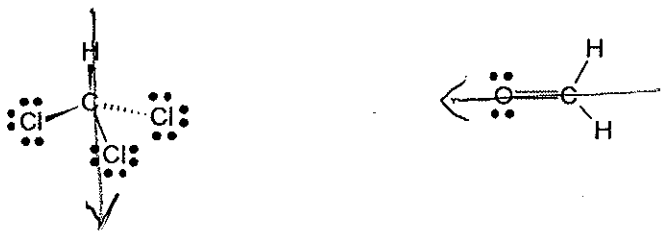
No formal charge on left version ⇒ more stable

4. Based on the HONC rules, can the molecular formula C_2H_2O exist as an organic chemical? (2 pt)

(YES) NO If yes, draw a likely structure.



5. For the molecular shapes below, predict the most likely direction of dipole (+ ⟶ -) (2 pt)



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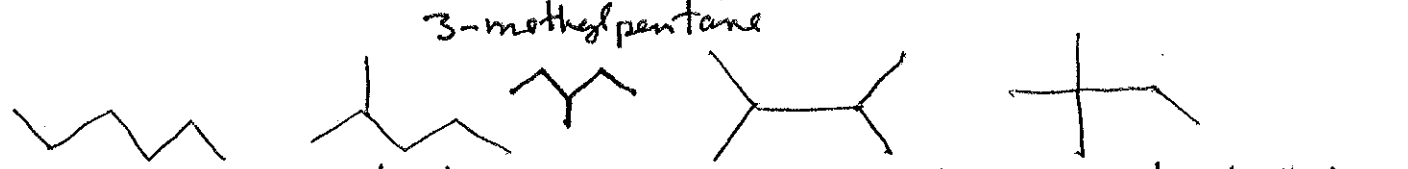
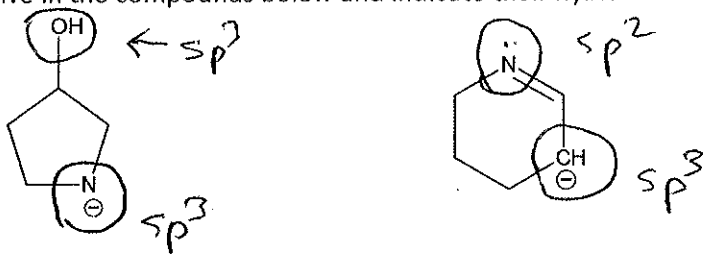
6. Determine the hybridization of the atoms indicated with each of the molecules below: (5 pt)

a) N sp^2 b) O sp^3 c) N sp d) O sp^3 e) C sp^3

7. Draw all the constitutional isomers of the formula C_6H_{14}. (4 pts)



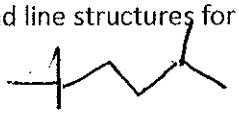
8. Circle where the lone pairs live in the compounds below and indicate their hybridization. (4 pts)



Hybridization(s)

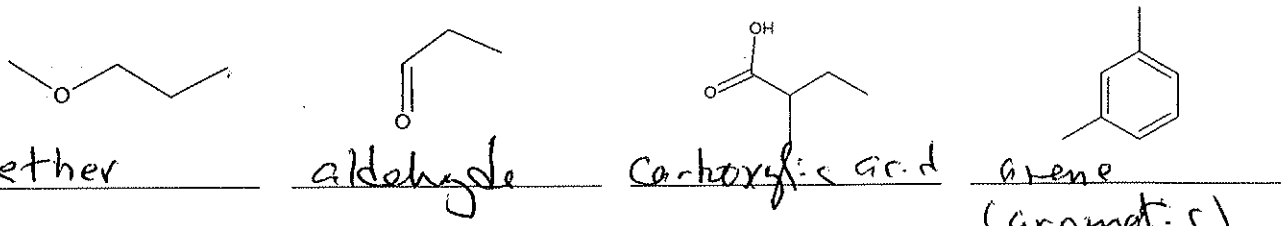
9. Draw the equivalent abbreviated bond line structures for the condensed structures below: (4 pts)

a) $(CH_3)_3CCH_2CH_2CH(CH_3)_2$



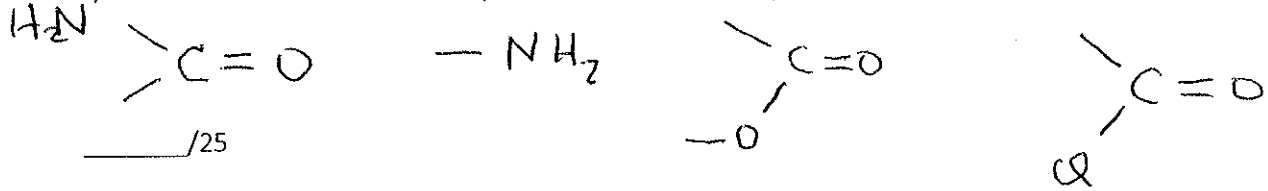
b) $(CH_3)_2CHCH_2CH_2OH$

10. Identify the functional groups represented by: (4 pt)



11. Draw specific examples of the functional groups: (4 pt)

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



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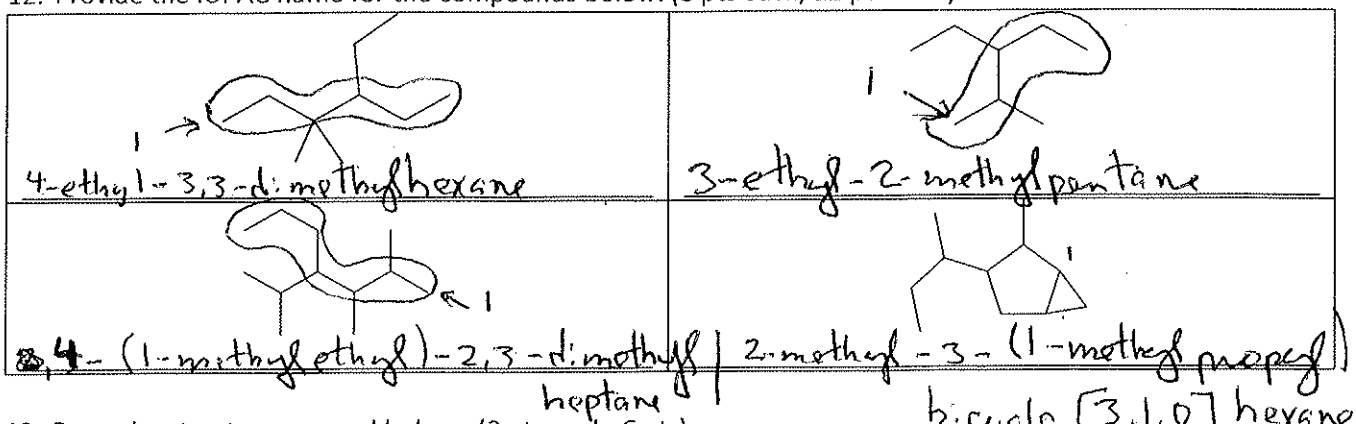
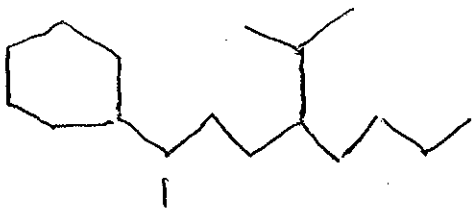
12. Provide the IUPAC name for the compounds below: (3 pts each, 12 pts total)



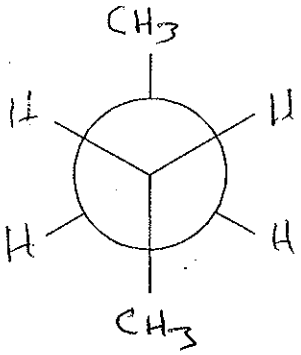
13. Draw the structures named below: (3 pts each, 6 pts)

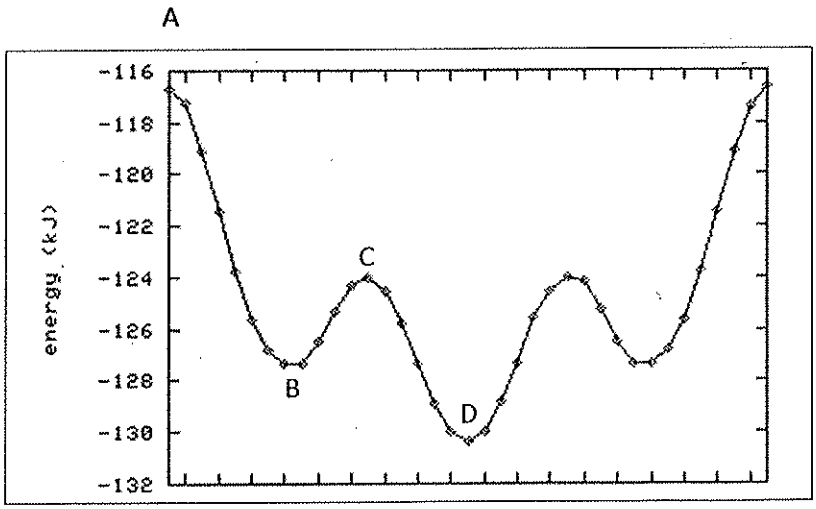
1-cyclohexyl-4-(1methylethyl)octane



3-isopropylbicyclo[3.2.0]heptane

14. For a-c, answer the following questions using the energy diagram below (right). The plastic models are available if you choose. (5 pts total)
    a) ID the position where the butane structure is anti D
    b) ID the position where the butane structure is gauche B
    c) Which position are the methyls on C2 and C3 of butane eclipsing each other? A
    d) Using the Newman projection template below (left), draw the structure associated with an anti butane configuration. (2 pt)





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