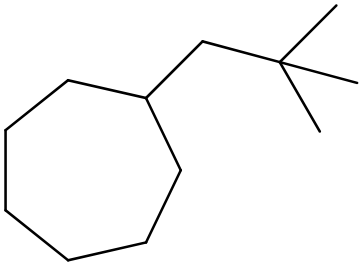
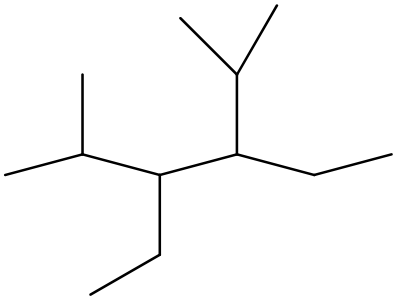
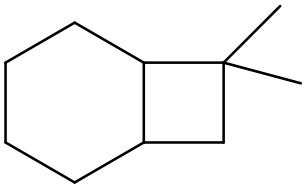
Organic 211 Test # 1 September 10, 2013

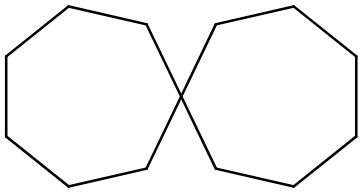
Name”_____

1) Give the names of the following molecules. (4 pts. each)

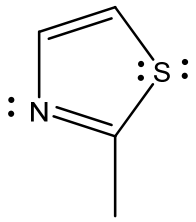
a) 

b) 

c) 

d) 

2) a) Draw the other resonance forms of the compound below. sp hybridization is not found in rings this size. Indicate formal charges of -1, 0 or +1. (4 pts.)

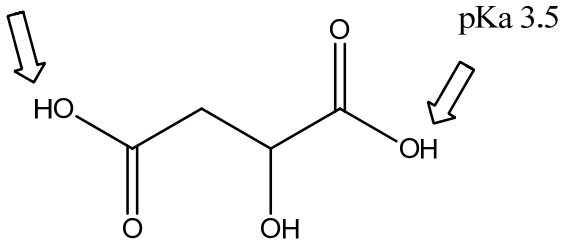


b) Draw a circle around the most significant resonance contributor.(2 pts.)

c) Explain why the resonance contributor you circled in part b is the most significant resonance contributor. (3 pts.)

3) Malic Acid is given below and used for this question. pKa's are indicated for the carboxylic acids. (4 pts. each)

pKa 5.5



a) Explain why the proton on the right is more acidic.

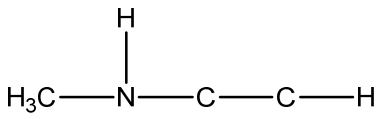
b) Draw what the major form of malic acid will look like at a pH of 6.4.

4) A molecule has a molecular formula of CH_2N_4. It will be used for the rest of this question. (4 pts. each.)

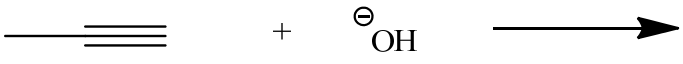
a) Draw compound A that contains no atoms with a formal charge and contains a ring of 4 atoms.

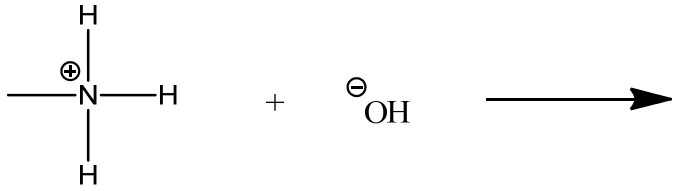
b) Draw compound B that contains no sp hybridized atom, no atoms with a formal charge and no ring.

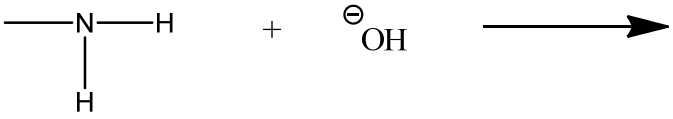
5) Compound C, C_3H_5N, is best shown as a set of two resonance contributors, one better than the other. Draw both of them below. Include formal charges of +1,-1, or 0 where appropriate. (5 pts.)



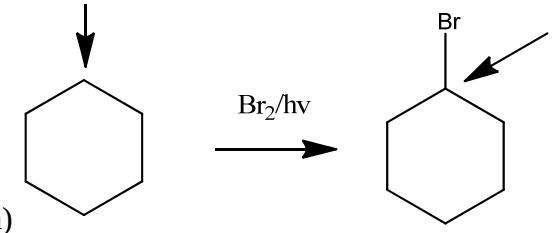
6) For the following reactions, draw the product(s) of the reactions. Indicate if no reaction is possible. For reactions that do form products, indicate if the Keq > 1 or Keq < 1. (3 pts. each)

a) 

b) 

c) 

7) Indicate if the reactions are oxidation, reductions or neither. (2 pts. each)

a) 

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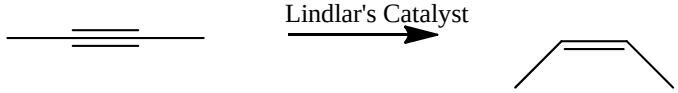
b) 

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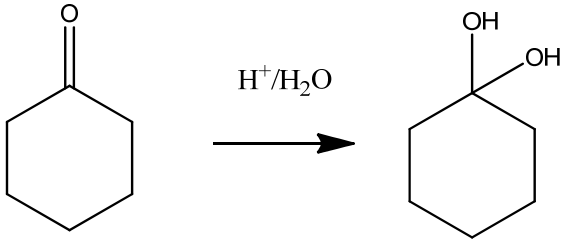
c) 

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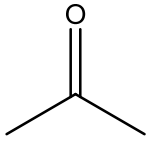
8) Match the compounds to the boiling point by drawing a line from the compound to the boiling point. (5 pts.)

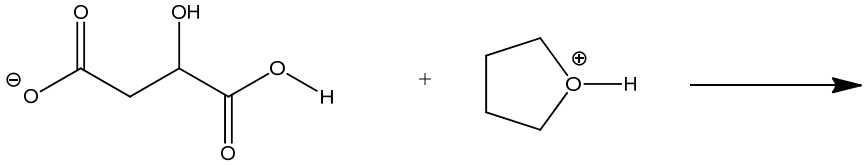


Acetone,	117 ^{o}C
Methanol CH_3OH	50.5 ^{o}C
Ethanol CH_3CH_2OH	79 ^{o}C
Propanol $CH_3CH_2CH_2OH$	64.7 ^{o}C
Butanol $CH_3CH_2CH_2CH_2OH$	97.5 ^{o}C

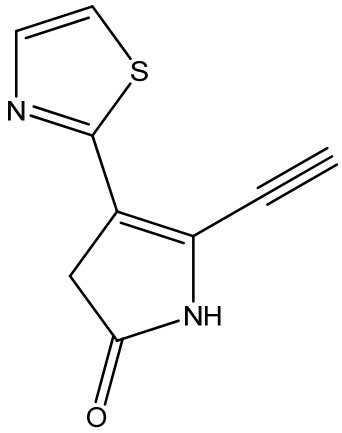
9) Draw 3 molecules that have the molecular formula of $C_7H_6O_2$ that DO NOT have a pKa of 4.5. (5 pts.)

10) Give the electronic configuration of iodine. (4 pts.)

11) Draw arrows to show the acid/base reaction below. (4 pts.)



12) Use the molecule below to answer this question.



a) Put a box around the sp atoms in the molecule. (2 pts.)
b) Circle the sp^3 atoms in the molecule. (2 pts.)
c) Put a triangle around the sp^2 atoms in the molecule. (2 pts.)
d) Put a rectangle around the shortest bond in the molecule. (2 pts.)
e) Draw an arrow to any protons with a pKa less than 10 in the molecule. (2 pts.)
f) Identify at least three functional groups in the molecule. (3 pts.)

13) Indicate on the electrostatic potential map on the last page the location of the negative and positive charge in the molecule shown. (4 pts.)

14) Free Question: Give something you studied that was not asked on this test. (4 pts.)