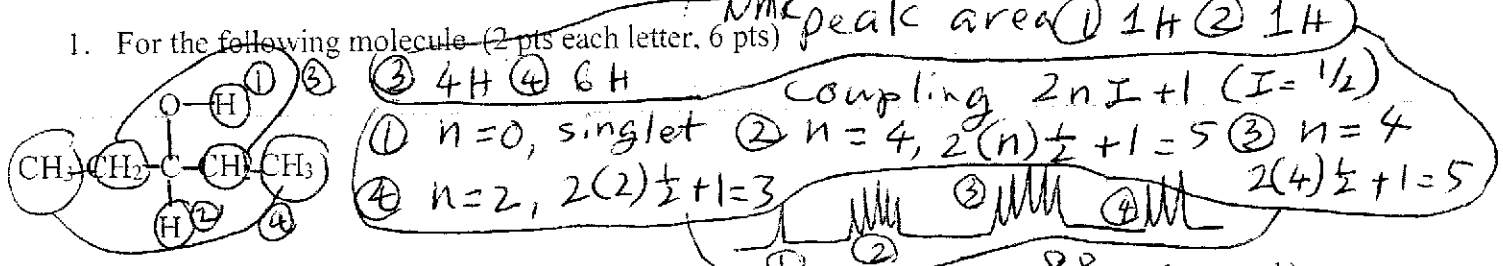


Sign Name Key Print Name \_\_\_\_\_

not on quiz - should be able to do

Please show work on all questions for partial credit even on questions which do not specify. (25 pts)



a) What is the molecular ion peak value for the molecule shown above 88 (show work)

$5(12) + 12(1) + 16 = 88$  (math - 1) (atomic # - 1)

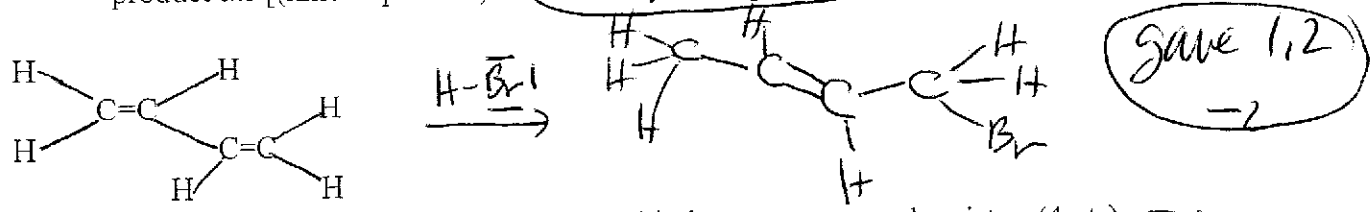
b) Give one IR peak from the IR chart specifying what structure gives that peak and the peak wavenumbers.

Functional group part is o-H alcohol giving IR peak 3400-3650  
c=O alcohol giving IR peak 1050-1150 cm<sup>-1</sup>

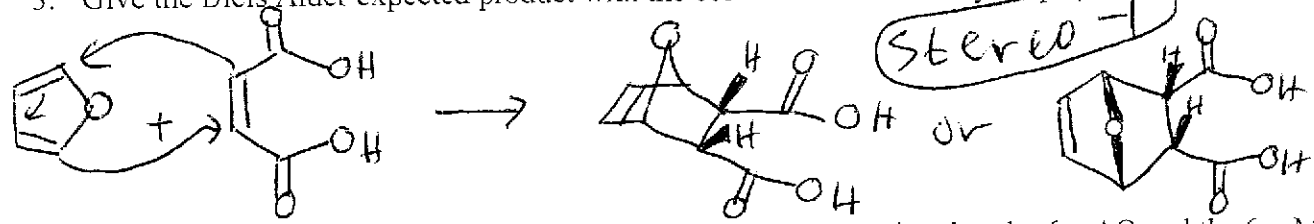
c) How many **proton** NMR peaks do you expect to see? [(1) (2) (3) (4) (5) (6)] circle one.

wrong # - 1 wrong # 1 2 pt

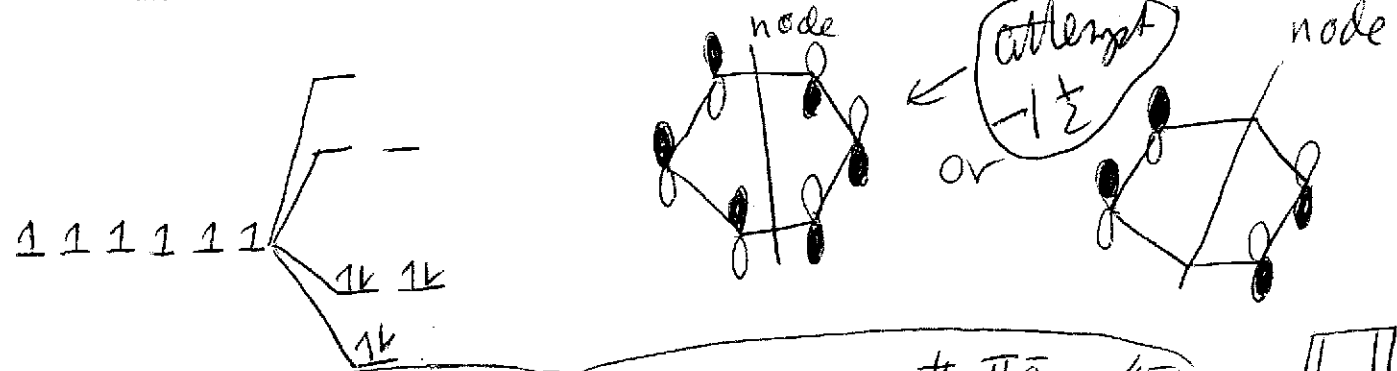
2. a) For the following reaction, show the Saytzeff's rule product. (6 pts) b) Is the Saytzeff's rule product the [(kinetic product) or (thermodynamic product)] (circle one). (2 pts)



3. Give the Diels Alder expected product with the correct stereochemistry. (4 pts)



4. For the molecule benzene, (a) draw the expected MO diagram showing the 6 p AO and the 6  $\pi$  MO and the correct energy of the MO (3 pts) (b) fill your MO drawing with 6  $\pi$  electrons (1 pt) (c) Draw the p atomic orbitals involved in the MO for one of the MOs with one nodes (3 pts) (7 pts total)



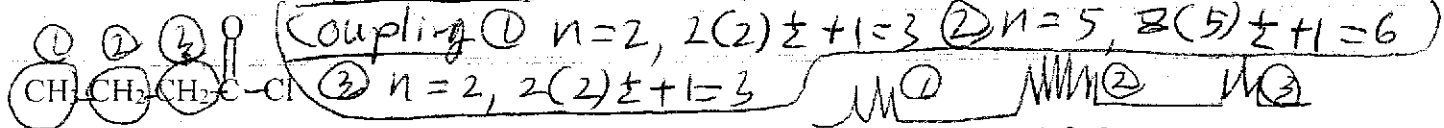
wrong molecule - 1  $n = 1/2$   $\leftarrow \# \pi e = 4e$  attempt - 1  
 Extra Credit (2 pts) Apply Hückel Rule equation of  $4n+2 = \# \pi$  electrons, to cyclobutadiene. Show work.  
 $4n+2 = 4e$  not aromatic

Sign Name Key

Print Name not on quiz be able to do

Please show work on all questions for partial credit even on questions which do not specify. (25 pts) (color)

1. For the following molecule (2 pts each letter, 6 pts)



a) What is the molecular ion peak value for the molecule shown above 106 (show work)

$4(12) + 7(1) + 16 + 35 = 106$

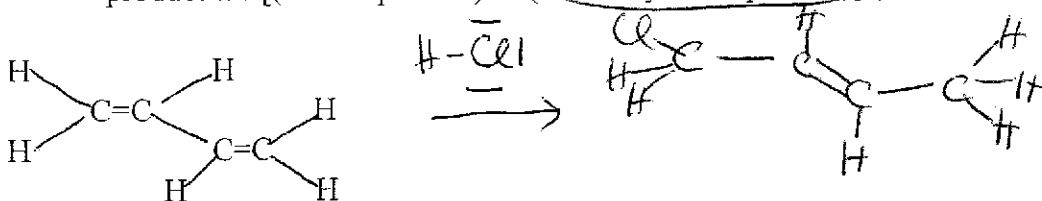
math - 1/2 atomic # - 1

b) Give one IR peak from the IR chart specifying what structure gives that peak and the peak wavenumbers.

Functional group part is C=O giving IR peak 1670-1780  $\text{cm}^{-1}$

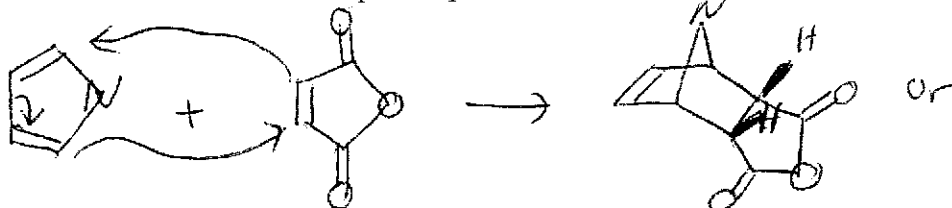
c) How many **proton** NMR peaks do you expect to see? [(1) (2) ③ (4) (5) (6)] circle one 2 pt

2. a) For the following reaction, show the Saytzeff's rule product. (6 pts) b) Is the Saytzeff's rule product the [(kinetic product) or (thermodynamic product)] (circle one). (2 pts)



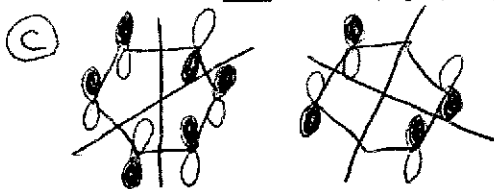
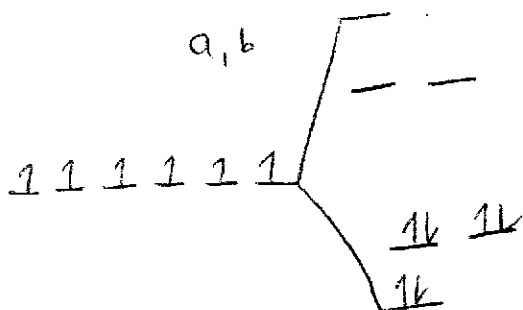
stable alkene  
gave 1,2 - 2 pt

3. Give the Diels Alder expected product with the correct stereochemistry. (4 pts)



stereo - 1

4. For the molecule benzene, (a) draw the expected MO diagram showing the 6 p AO and the 6  $\pi$  MO and the correct energy of the MO (3 pts) (b) fill your MO drawing with 6  $\pi$  electrons (1 pt) (c) Draw the p atomic orbitals involved in the MO for one of the MOs with **two** nodes (3 pts) (7 pts total)



attempt - 1/2

wrong molecule - 1 attempt - 1

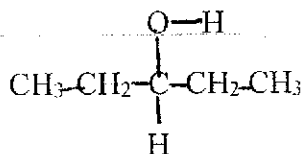
$4n+2 = 8 \rightarrow n = \frac{6}{4}$  NOT aromatic
   
 $8 \pi e$

Extra Credit: (2 pts) Apply Hückel Rule equation of  $4n+2 = \# \pi$  electrons, to cyclooctatetraene. Show work.

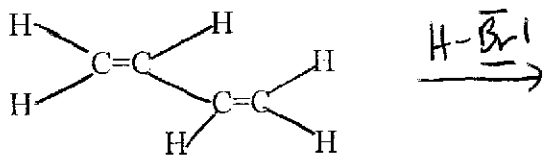
Sign Name \_\_\_\_\_ Print Name \_\_\_\_\_

Please show work on all questions for partial credit even on questions which do not specify. (25 pts)

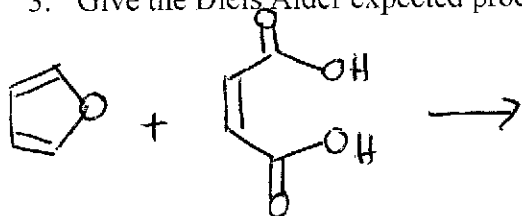
1. For the following molecule (2 pts each letter, 6 pts)



- a) What is the molecular ion peak value for the molecule shown above \_\_\_\_\_ (show work)
- b) Give one IR peak from the IR chart specifying what structure gives that peak and the peak wavenumbers.  
 Functional group part is \_\_\_\_\_ giving IR peak \_\_\_\_\_  $\text{cm}^{-1}$
- c) How many **proton** NMR peaks do you expect to see? [(1) (2) (3) (4) (5) (6)] circle one.
2. a) For the following reaction, show the Saytzeff's rule product. (6 pts) b) Is the Saytzeff's rule product the [(kinetic product) or (thermodynamic product)] (circle one). (2 pts)



3. Give the Diels Alder expected product with the correct stereochemistry. (4 pts)



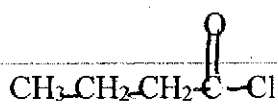
4. For the molecule benzene, (a) draw the expected MO diagram showing the 6 p AO and the 6  $\pi$  MO and the correct energy of the MO (3 pts) (b) fill your MO drawing with 6  $\pi$  electrons (1 pt) (c) Draw the p atomic orbitals involved in the MO for one of the MOs with **one** nodes (3 pts) (7 pts total)

**Extra Credit:** (2 pts) Apply Huckel Rule equation of  $4n+2 = \# \pi$  electrons, to **cyclobutadiene**. Show work.

Sign Name \_\_\_\_\_ Print Name \_\_\_\_\_

Please show work on all questions for partial credit even on questions which do not specify. (25 pts) (color)

1. For the following molecule (2 pts each letter, 6 pts)



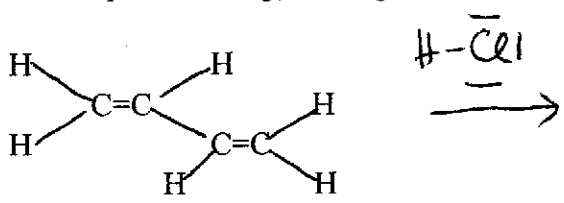
a) What is the molecular ion peak value for the molecule shown above \_\_\_\_\_ (show work)

b) Give one IR peak from the IR chart specifying what structure gives that peak and the peak wavenumbers.

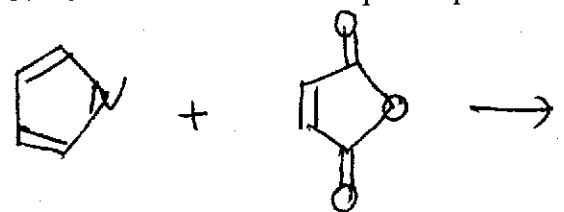
Functional group part is \_\_\_\_\_ giving IR peak \_\_\_\_\_  $\text{cm}^{-1}$

c) How many **proton** NMR peaks do you expect to see? [(1) (2) (3)(4)(5)(6)] circle one.

2. a) For the following reaction, show the Saytzeff's rule product. (6 pts) b) Is the Saytzeff's rule product the [(kinetic product) or (thermodynamic product)] (circle one). (2 pts)



3. Give the Diels Alder expected product with the correct stereochemistry. (4 pts)



4. For the molecule benzene, (a) draw the expected MO diagram showing the 6 p AO and the 6  $\pi$  MO and the correct energy of the MO (3 pts) (b) fill your MO drawing with 6  $\pi$  electrons (1 pt) (c) Draw the p atomic orbitals involved in the MO for one of the MOs with **two** nodes (3 pts) (7 pts total)

Extra Credit: (2 pts) Apply Huckel Rule equation of  $4n+2 = \# \pi$  electrons, to **cyclooctatetraene**. Show work.