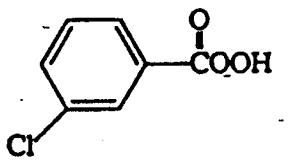
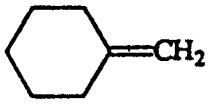
CHEM 118B WORKSHOP
PRACTICE FINAL
JIM HOLLISTER

PLEASE WRITE YOUR ANSWERS IN THE SPACES PROVIDED

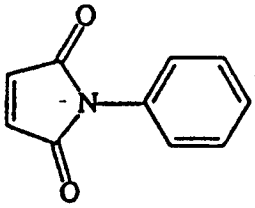
1. (40 points) Give the structure of the major organic product expected from each of the following reactions. Clearly indicate the product stereochemistry where applicable.

a. 

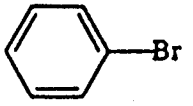
$\xrightarrow[2.\ H_2SO_4,\ H_2O]{1.\ \bigcirc}$ _____

b. 

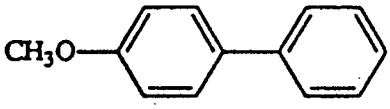
$\xrightarrow[H_2O]{Br_2}$ _____

c. 

$\xrightarrow[\text{heat}]{CH_2{=}C(OCH_3){-}CH{=}CH_2}$ _____

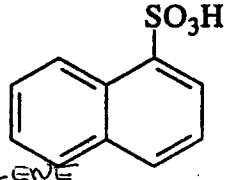
d. 

$\xrightarrow[AlCl_3]{\text{one mole } CH_3CH_2CH_2CH_2Cl}$ _____

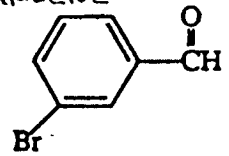
e. 

$\xrightarrow[H_2SO_4]{\text{one mole } HNO_3}$ _____

DID YOUR PROF, GO OVER NAPTHALENE RXNS?

f. 

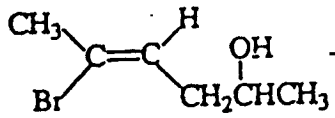
$\xrightarrow{Br_2,\ CCl_4,\text{heat}}$ _____

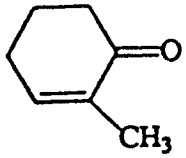
g. 

$\xrightarrow[NaOH,\ H_2O,\ \text{heat}]{CH_3CH_2\overset{O}{\overset{\|}{C}}H}$ _____

h. $ClCH_2\overset{O}{\overset{\|}{C}}H$ $\xrightarrow[2.\ NaOH]{1.\ (C_6H_5)_3P}$ $\xrightarrow{3.\ CH_3\overset{CH_3}{\overset{|}{C}}H\overset{O}{\overset{\|}{C}}H}$ _____

2. a. (8 points) Complete the IUPAC name given for each of the following compounds.

i.  ____ – 5 – bromo – 4 – _____ – ___ – _____

ii.  ____ – methyl – ___ – _____

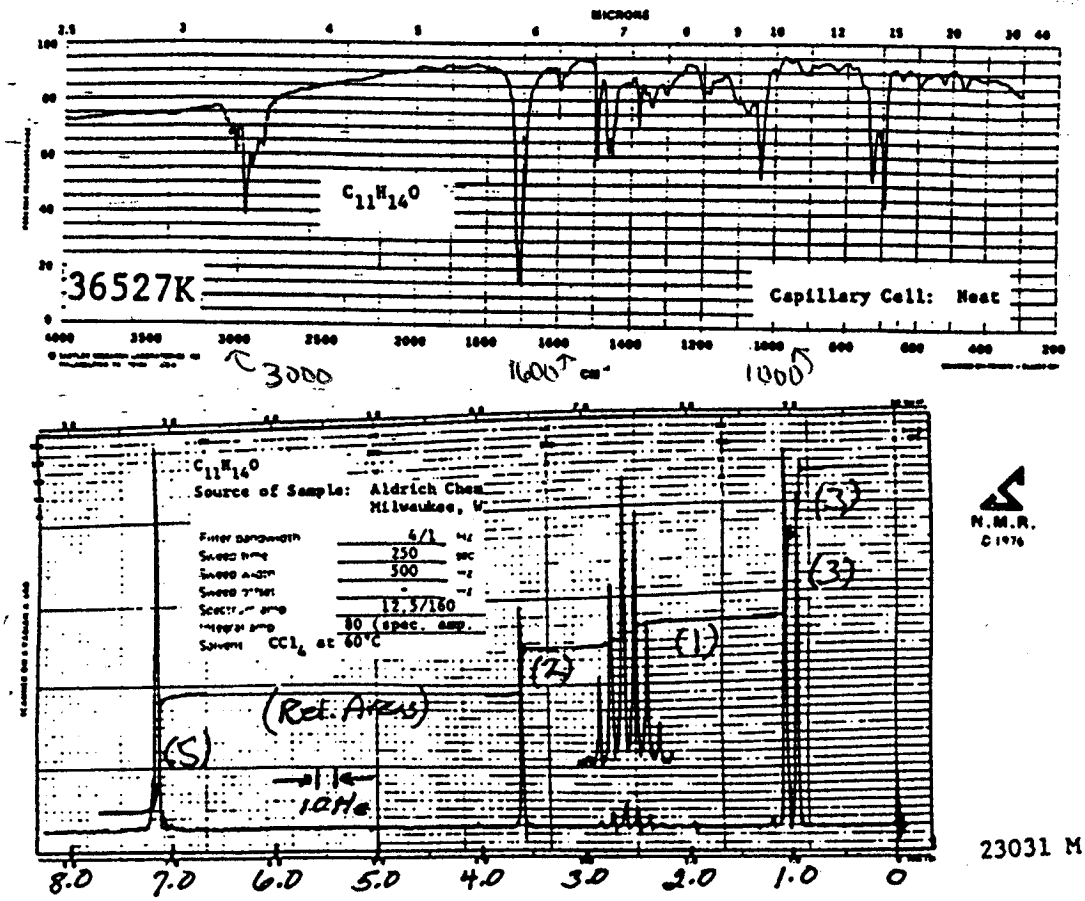
b. (12 points) Complete the structural formula for each of the following compounds.

1-bromo-2methyl-3-pentanone	3-hydroxy-4-methyl-pentanal	3,3-dimethyl-4-penten-2-one

3. **a.** (12 points) The stepwise mechanism for the acid-catalyzed reaction of ethanal (CH_3CHO) and two moles of methanol to give 1,1-dimethoxyethane involves six intermediates. The first and the sixth are the protonated ethanal and the protonated 1,1-dimethoxyethane, respectively. Draw the structures of the other four intermediates in the boxes below in the order requested. Be certain to show the positions and signs of all charges.

second	third	fourth	fifth

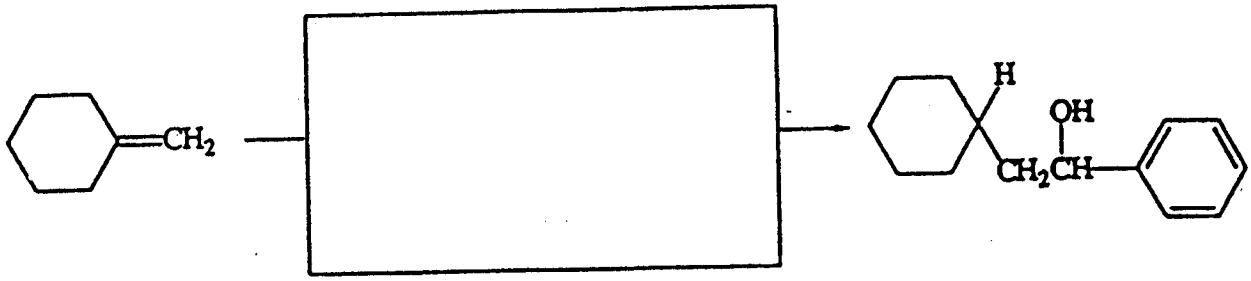
b. (8 points) Draw a possible structure in the box provided for the compound whose molecular formula, infrared spectrum and ^1H NMR spectrum are given below.



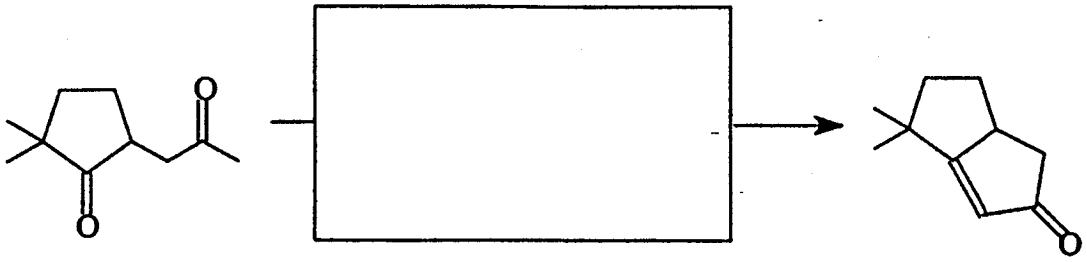
$C_{11}H_{14}O$

4. (24 points) Show how you could carry out the following transformations in high yields by indicating the reagents and any special solvents or reaction conditions needed in the boxes. You may use any other common organic compounds as starting materials and reagents. Also, you may use any necessary solvents and inorganic reagents. If more than one step is required you must number these as 1., 2., 3., etc. It is not necessary to show structures of intermediates or to discuss the reaction mechanisms.

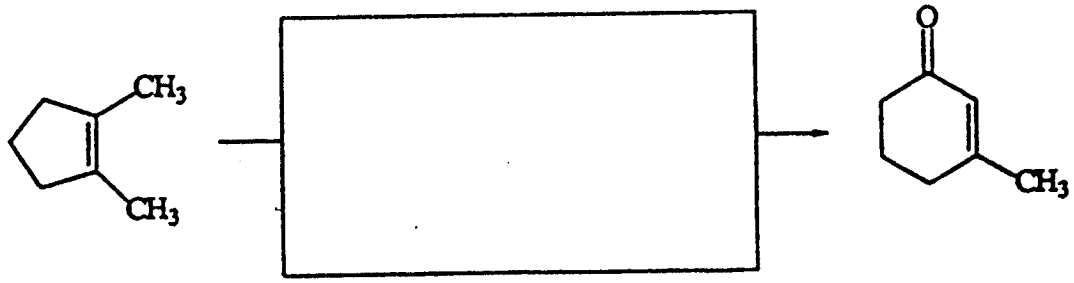
a.



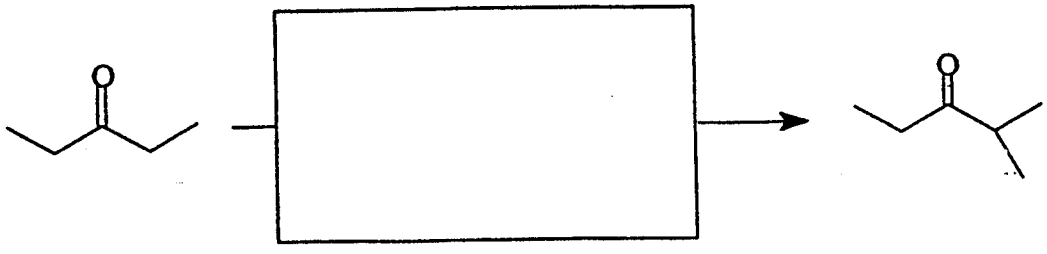
b.



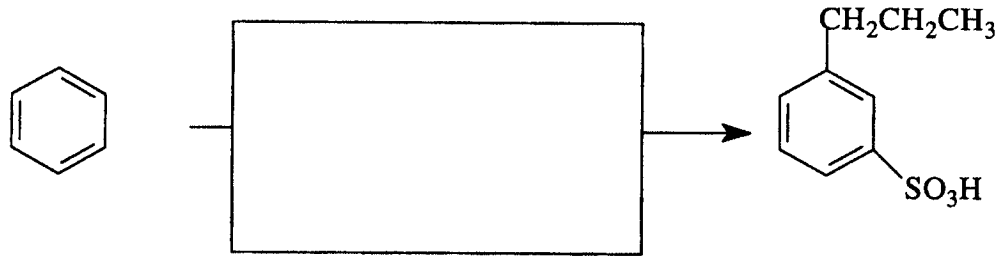
c.



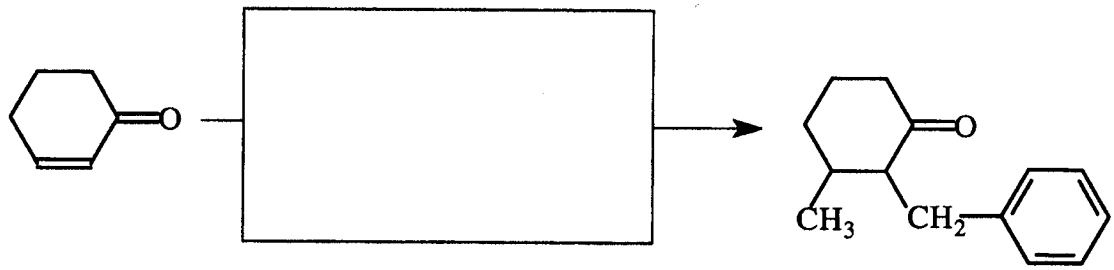
d.



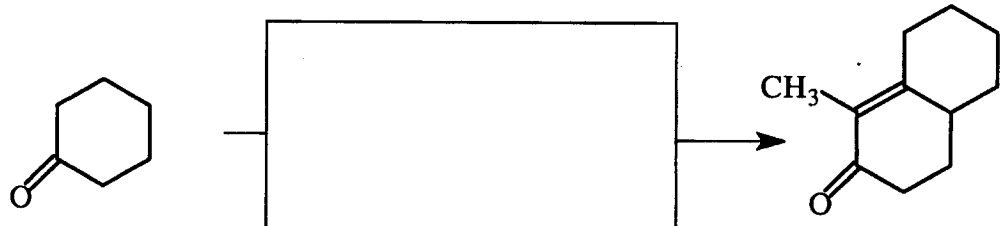
e.



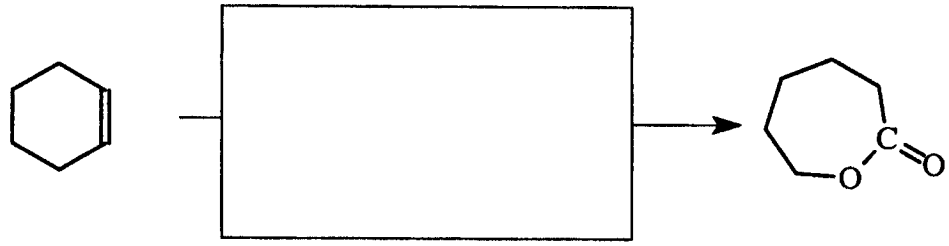
f.



g.



h.



5. Show the mechanism for the base ($^-$OD) catalyzed replacement of a single alpha-hydrogen in propanone by deuterium from D_2O.