

PRINTED
FIRST NAME _____PRINTED
LAST NAME _____ASU ID or
Posting ID _____Person on your **LEFT** (or **Aisle**)Person on your **RIGHT** (or **Aisle**)

- **PRINT YOUR NAME ON EACH PAGE!**
- **READ THE DIRECTIONS CAREFULLY!**
- **USE BLANK PAGES AS SCRATCH PAPER**
work on blank pages will not be graded...
- **WRITE CLEARLY!**
- **MOLECULAR MODELS ARE ALLOWED**
- **DO NOT USE RED INK**
- **DON'T CHEAT, USE COMMON SENSE!**

1 _____ /9 9 _____ /20.....

2 _____ /15.....

3 _____ /12.....

4 _____ /14.....

5 _____ /32.....

6 _____ /38.....

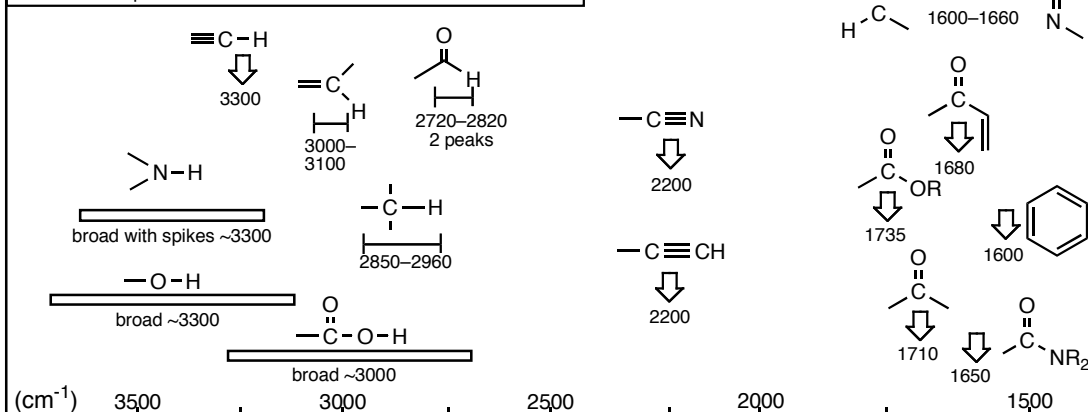
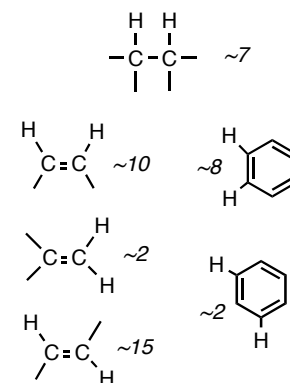
7 _____ /20.....

8 _____ /20.....

Extra Credit _____ /5 Total (incl Extra) _____ /180+5

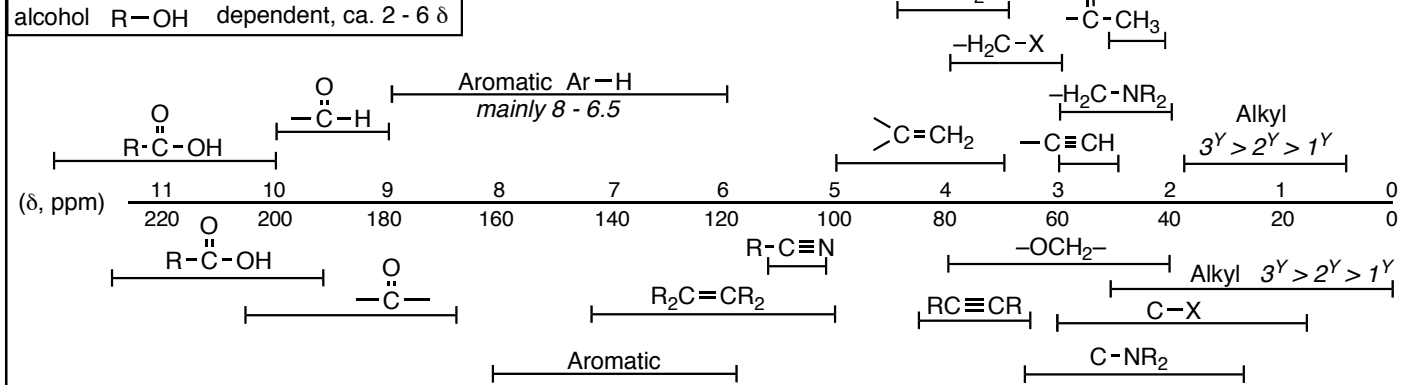
H													He													Interaction Energies, kcal/mol			
Li Be													B C N O F Ne													Eclipsing		Gauche	
Na Mg													Al Si P S Cl Ar													H/H	~1.0	Me/Me	~0.9
K Ca Sc Ti V Cr Mn Fe Co Ni Cu Zn													Ga Ge As Se Br Kr													H/Me	~1.4	Et/Me	~0.95
Rb Sr Y Zr Nb Mo Tc Ru Rh Pd Ag Cd													In Sn Sb Te I Xe													Me/Me	~2.6	i-Pr/Me	~1.1
Cs Ba Lu Hf Ta W Re Os Ir Pt Au Hg													Tl Pb Bi Po At Rn													Me/Et	~2.9	t-Bu/Me	~2.7

Infrared Correlation Chart

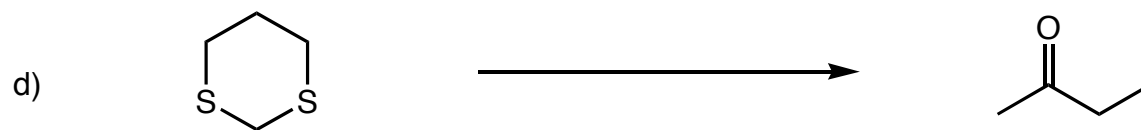
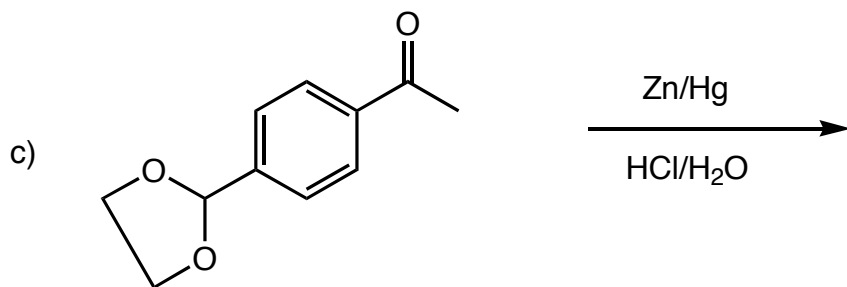
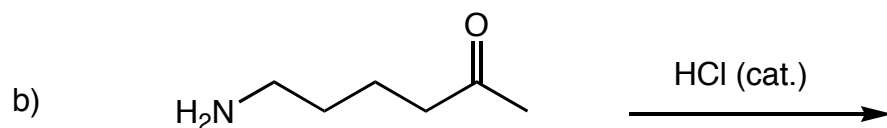
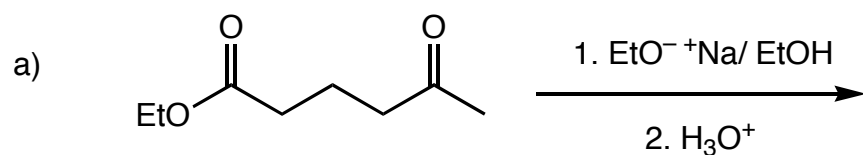
Approximate Coupling Constants, J (Hz), for ¹H NMR Spectra

amine R-NH₂ variable and condition dependent, ca. 2 - 6 δ
alcohol R-OH

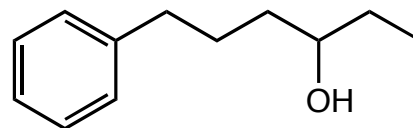
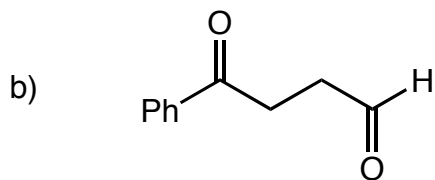
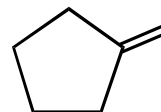
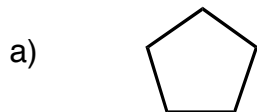
NMR Correlation Charts



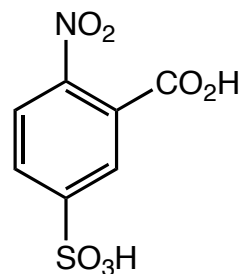
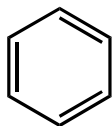
Question 5 (32 pts.) provide the reaction products or reagents/conditions as required



Question 6 (38 pts.) In each case, synthesize the (target) molecules on the right from the starting molecules the left. this can not be done in one reaction. Give reagents and conditions and the intermediate molecules at each step. Do not show any mechanisms or transient intermediates.



Question 7 (20 pts.) Synthesize the (target) molecule on the right from the starting molecule the left. this can not be done in one reaction. Give reagents and conditions and the intermediate molecules at each step. Do not show any mechanisms or transient intermediates.



Extra credit question (5 pts). A photochemical 2 + 2 cycloaddition reaction occurs in

DNA

Hemoglobin

Vitamin C

peroxidase

from weekly work #12

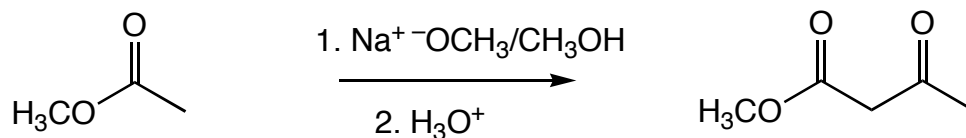
Question 8 (20 pts.) Give a complete arrow-pushing mechanism for the following reaction

Show exactly where each proton comes from and goes to.

Add non-bonding electrons and hydrogen atoms as necessary

Indicate the lewis acid/base for each INTERmolecular step (LB or LA) and whether they are also Brønsted bases/acids (LB/BB or LA/BA)

SHOW ALL RESONANCE STRUCTURES OF THE INTERMEDIATES



Question 9 (20 pts.) Give a complete arrow-pushing mechanism for the following reaction.

Show exactly where each proton comes from and goes to.

Add non-bonding electrons and hydrogen atoms as necessary

Indicate the lewis acid/base for each INTERmolecular step (LB or LA) and whether they are also Brønsted bases/acids (LB/BB or LA/BA)

SHOW ALL RESONANCE CONTRIBUTORS OF THE INTERMEDIATES

