

COMPLETE THIS SECTION : Up to TWO POINTS will be removed for incorrect/missing information!

PRINTED FIRST NAME _____ PRINTED LAST NAME _____

Person on your LEFT (or Empty or Aisle) _____

Person on your RIGHT (or Empty or Aisle) _____

Class you are REGISTERED FOR (onground or hybrid) _____

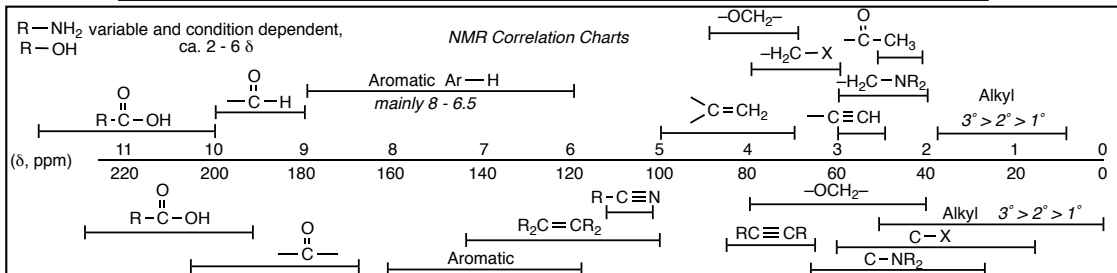
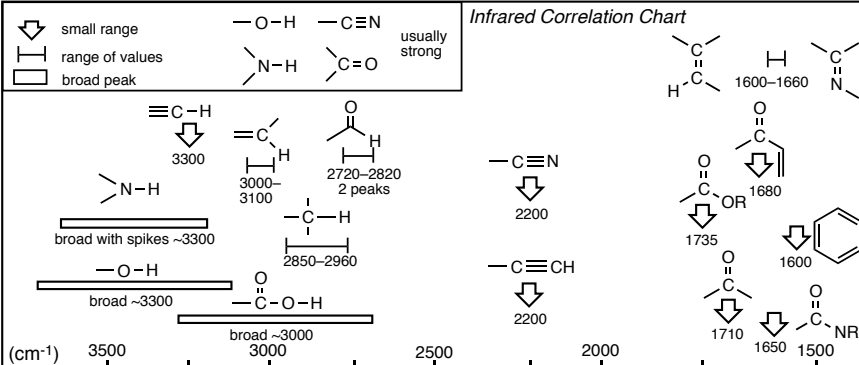
The room where most students will take the test for your class, i.e. LS A-191 for onground and PS H-152 for hybrid) _____

****YOU ARE NOT ALLOWED TO TAKE SPARE COPIES OF THIS EXAM FROM THE TESTING ROOM****

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

H																He															
Li Be														B C N O F		Ne															
Na Mg														Al Si P S Cl Ar																	
K Ca Sc Ti V Cr Mn Fe Co Ni Cu Zn														Ga Ge As Se Br Kr																	
Rb Sr Y Zr Nb Mo Tc Ru Rh Pd Ag Cd														In Sn Sb Te I Xe																	
Cs Ba Lu Hf Ta W Re Os Ir Pt Au Hg														Tl Pb Bi Po At Rn																	

Interaction Energies, kcal/mol			
Eclipsing		Gauche	
H/H	-1.0	Me/Me	-0.9
H/Me	-1.4	Et/Me	-0.95
Me/Me	-2.6	i-Pr/Me	-1.1
Et/Et	-3.1	t-Bu/Me	-2.7



**YOU MUST COMPLETE THIS PAGE WITH YOUR NAME
(EVEN THOUGH YOU ALREADY DID THIS ON THE COVER PAGE)
AND ALSO GIVE YOUR ASU OR POSTING ID NUMBER
WE NEED THIS NUMBER BECAUSE YOU WOULDN'T BELIEVE THE NUMBER OF
STUDENTS WHOSE NAMES WE CAN'T READ!**

PRINTED
FIRST NAME _____ *PRINTED*
LAST NAME _____ *ASU ID or*
Posting ID _____

Points by question

1 _____ / 13
2 _____ / 22
3 _____ / 40
4 _____ / 40
5 _____ / 40
5 _____ / 20

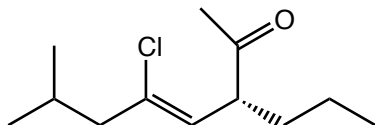
Points Removed for cover errors ____/2

Extra Credit ____/5

Total (incl Extra) _____/175+5

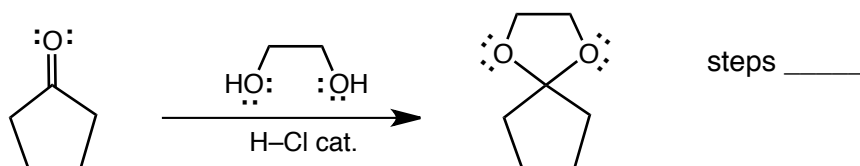
****YOU ARE NOT ALLOWED TO TAKE SPARE COPIES OF THIS EXAM FROM THE TESTING ROOM****

Question 1 (13 pts). Give the IUPAC name for the following compound. Be sure to use cis/trans, E/Z or R/S where appropriate.

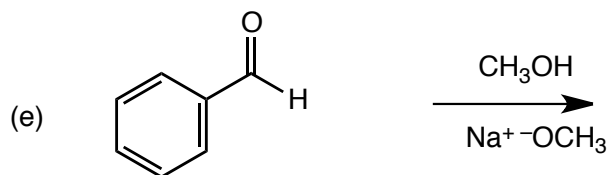
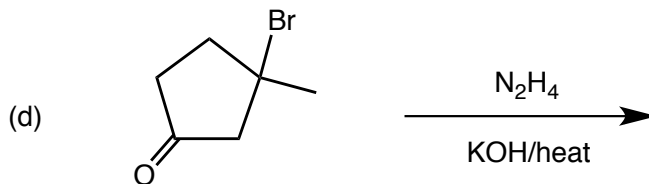
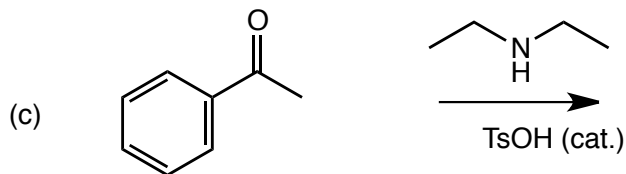
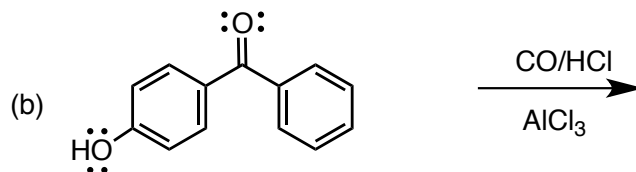
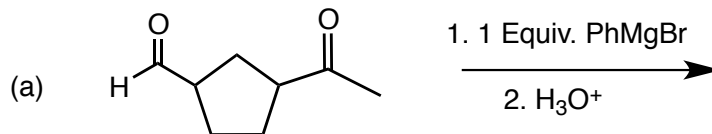


Question 2 (22 pts.) Give a arrow-pushing mechanism for the following reaction, indicate the Lewis and Bronsted acids/bases for each intermolecular step (LB, LB, BB, BA)

- Show all resonance contributors for the intermediates
- Show where all protons come from and go to (no $+H^+/-H^+$)
- Give the number of steps in your mechanism



Question 3 (40 pts.) Provide the missing major organic products or reagents/conditions as appropriate, you can IGNORE stereochemistry in these problems



Extra credit question (5 pts). β -carotene is synthesized using which reaction?

Clemmenson

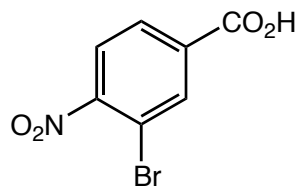
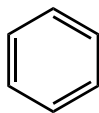
Grignard

Wittig

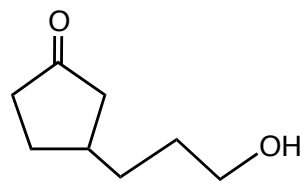
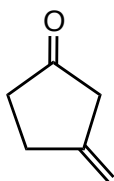
Aldol

Question 4 (40 pts.) 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. If other isomers are formed at any step then you need to indicate this but you do not need to draw their structures.

a)

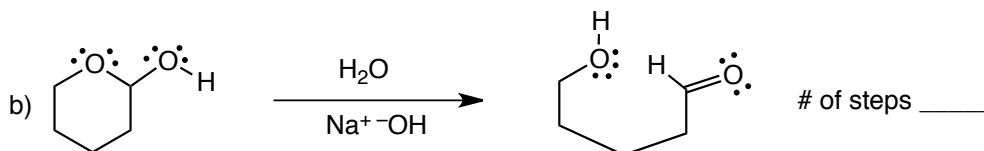
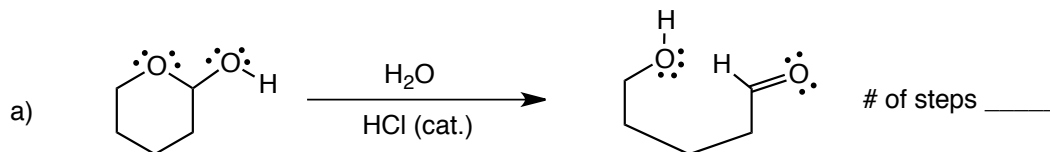


b)



Question 5 (40 pts.) Give a complete arrow-pushing mechanism for the following reactions, indicate the Lewis and Bronsted acids/bases for each intermolecular step (LB, LB, BB, BA)

- Show all resonance contributors for the intermediates
- Show where all protons come from and go to (no $+H^+/-H^+$)
- Give the number of steps in your mechanism



Question 6 (20 pts). Rank the following reactions in order of increasing rate. Give a BRIEF explanation that includes the terms Lewis acidity/basicity **OR** nucleophilicity/electrophilicity (almost all points for the explanation, not getting the order correct)

