

Second Exam

Name (PRINT) _____

Last, First

Chemistry 3332

Signature _____

March 24, 2006

ID# _____

Please circle class time.

Dr. Bean's 10:00 AM

Dr. Bean's 1:00 PM

Page #	Score	
1. 12 pts.		
2. 15 pts.		
3. 18 pts.		
4. 18 pts.		
5. 13 pts.		
6. 12 pts.		
7. 12 pts.		

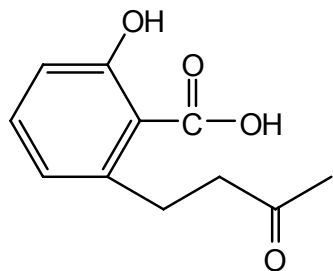
TOTAL _____

Note: Present your student ID when you return the exam booklet

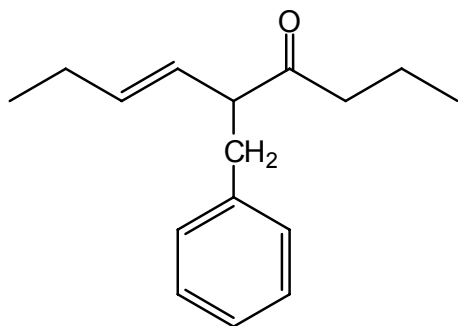
A. Nomenclature: (12 points)

Give an acceptable IUPAC name for each of the following compounds. Be sure to indicate the **stereochemistry** where appropriate.

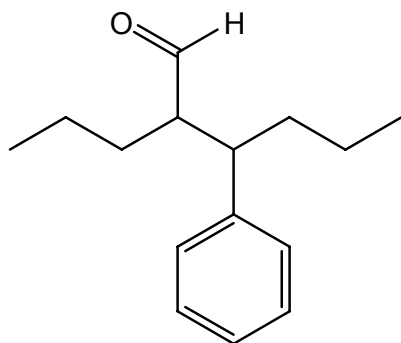
1.



2.

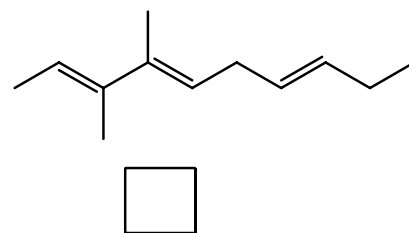
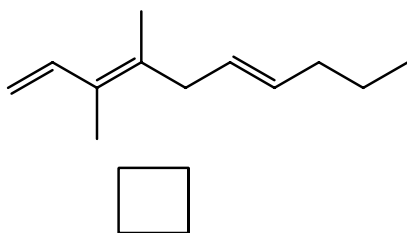
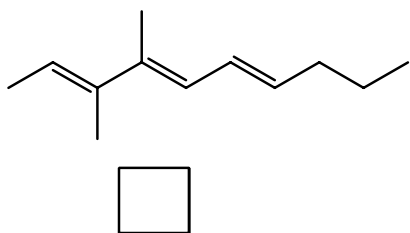


3.

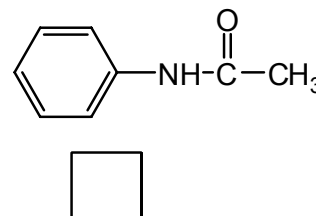
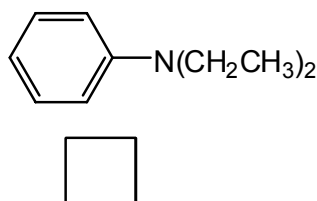
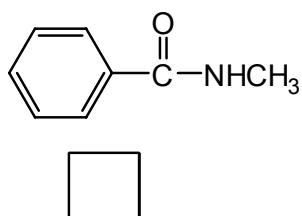


B. Facts: (15 points total)

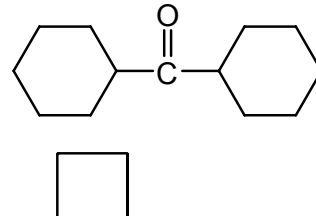
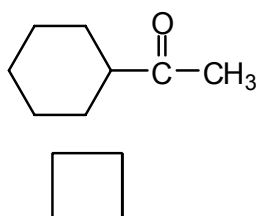
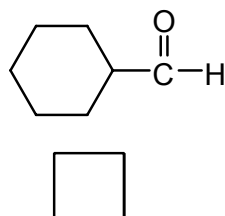
1. Place the compounds in increasing order of λ_{\max} (wavelength) for the π to π^* transition observed in the UV spectrum. (shortest wavelength = 1, longest wavelength = 3) (3 pts.)



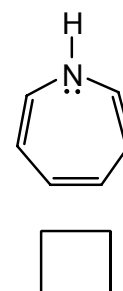
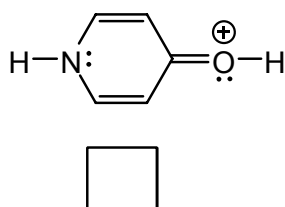
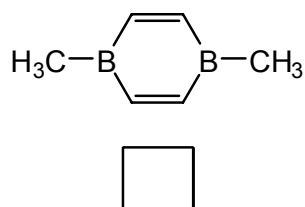
2. Place the compounds in order of increasing reaction rate with bromine in an electrophilic aromatic substitution reaction. (1 = slowest rate, 3 = fastest rate) (3 pts.)



3. Place the compounds in order of increasing reactivity in a nucleophilic addition reaction. (1 = least reactive, 3 = most reactive) (3 pts.)



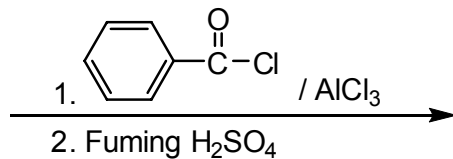
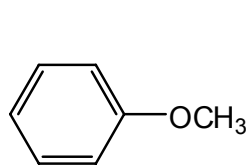
4. Label the compounds as aromatic (AR), antiaromatic (AA), or nonaromatic (NA). (You may assume all are planar.) (6 pts.)



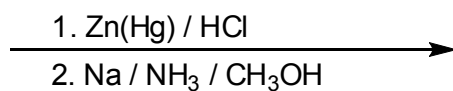
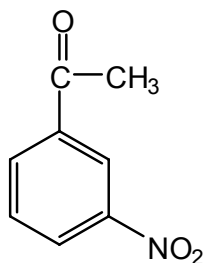
C. Reactions: Total = 36 points, 6 points each

Please provide the major product or the reagents in the answer box. Be sure your drawing indicates **stereochemistry** if applicable. Partial credit is awarded only when intermediate products in a multi-step reaction are shown below the reaction.

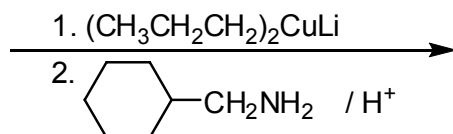
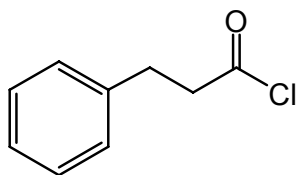
1.



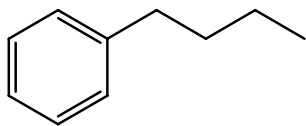
2.



3.



4.



1. Br_2 / light
 2. Mg / ether
 3. $\text{CH}_3\text{CH}_2\text{CN}$, then H_3O^+



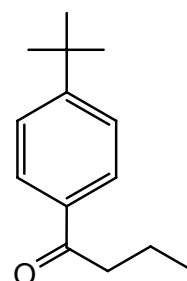
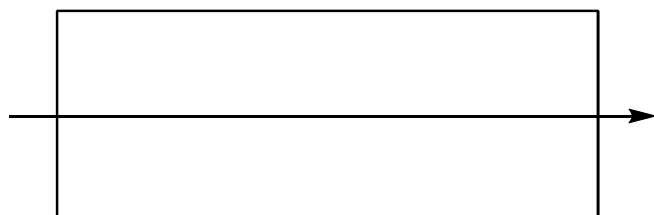
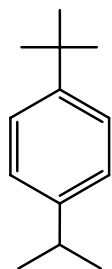
5.



1. O_3
 2. $(\text{CH}_3)_2\text{S}$
 3. NaCN / H^+ or HCN / CN^-

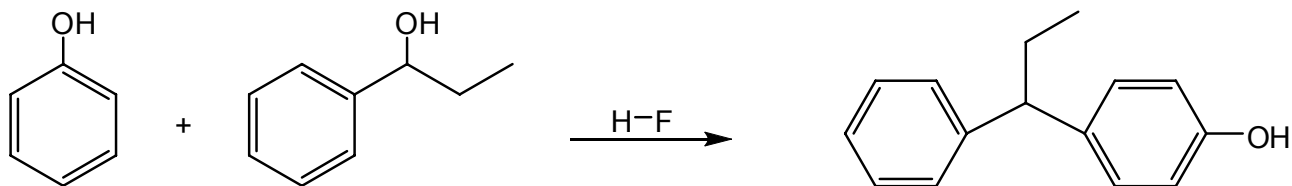


6.



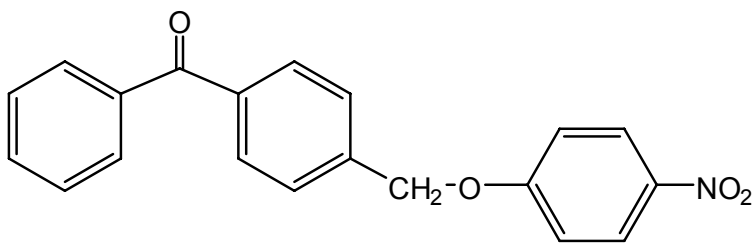
D. Mechanisms: (13 points)

Provide a clear mechanism to explain the formation of the product. Use curved arrows to indicate “electron flow”. Remember to show only one step at a time. **Show all intermediates and all formal charges.** **When more than one resonance contributor may be drawn, be sure to draw the most stable contributor.**



E. Synthesis: 12 Points

Synthesize the molecule below using any of the following reagents: benzene, any **stable, one carbon** molecule, any inorganic reagents, any oxidizing or reducing agents, and any peroxyacids.



F. Spectroscopy: 12 Points

A compound with the formula $C_9H_{18}O$ exhibits the IR, 1H NMR and proton decoupled ^{13}C NMR spectra shown below. Please identify this compound and draw the structure in the box provided below.

