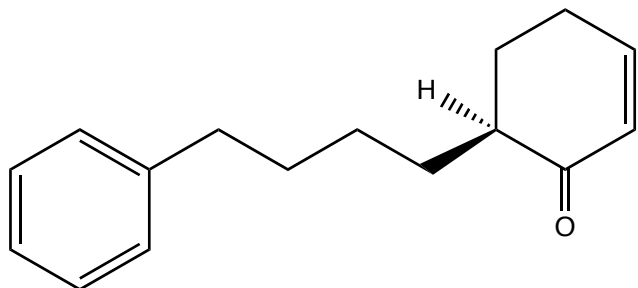
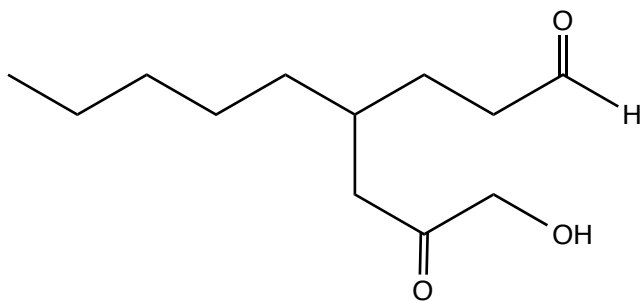
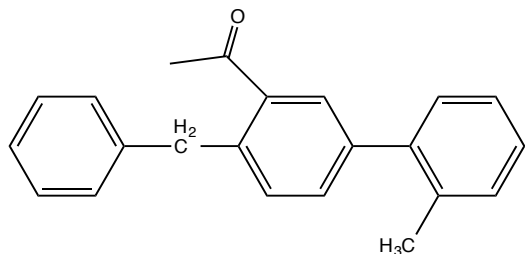


Spring 2015 Exam

A. Nomenclature (12 pts)

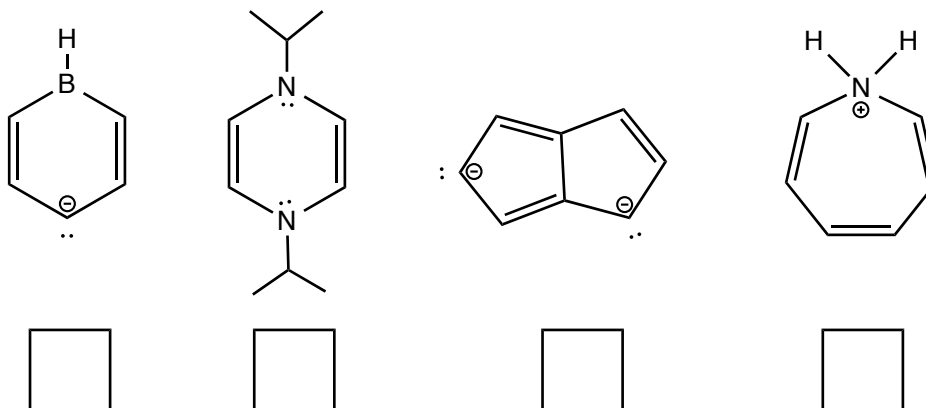
Give an acceptable IUPAC name for each of the following compounds. Be sure to indicate **stereochemistry** where appropriate.



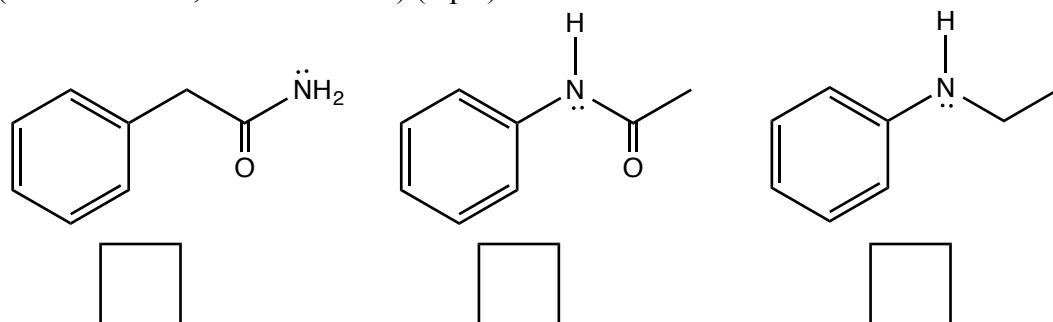
Spring 2015 Exam

B. Facts (18 pts)

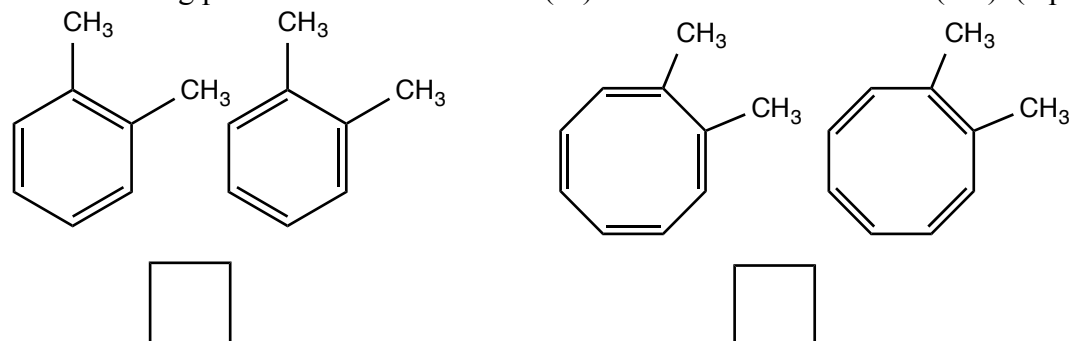
1. Label the molecules below as aromatic (AR), antiaromatic(AA), or nonaromatic (NA). Please assume all are planar (8 pts)



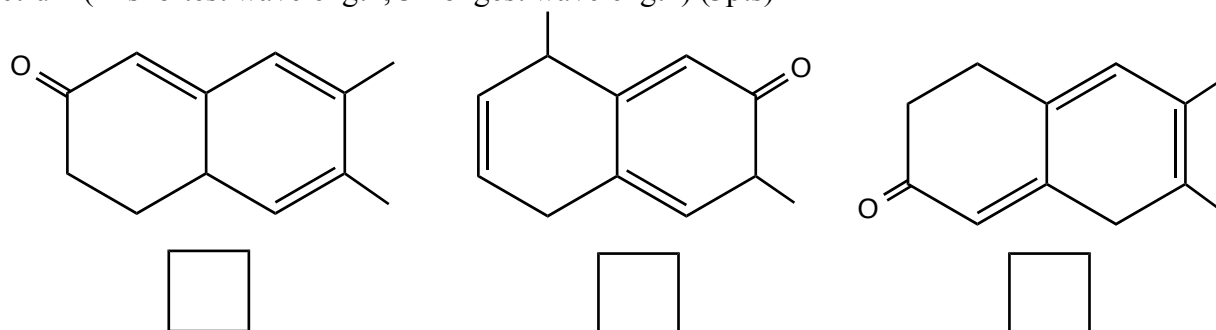
2. Rank the following substituted benzene compounds in order of increasing rate in a reaction with CH₃Cl and AlCl₃ (1=slowest rate, 3 = fastest rate) (3 pts)



3. Label the following pairs as structural isomers (SI) or resonance contributors (RC). (4 pts)



4. Rank the following compounds in order of increasing wavelength of the pi to pi* transition in the UV spectrum (1=shortest wavelength, 3=longest wavelength) (3pts)

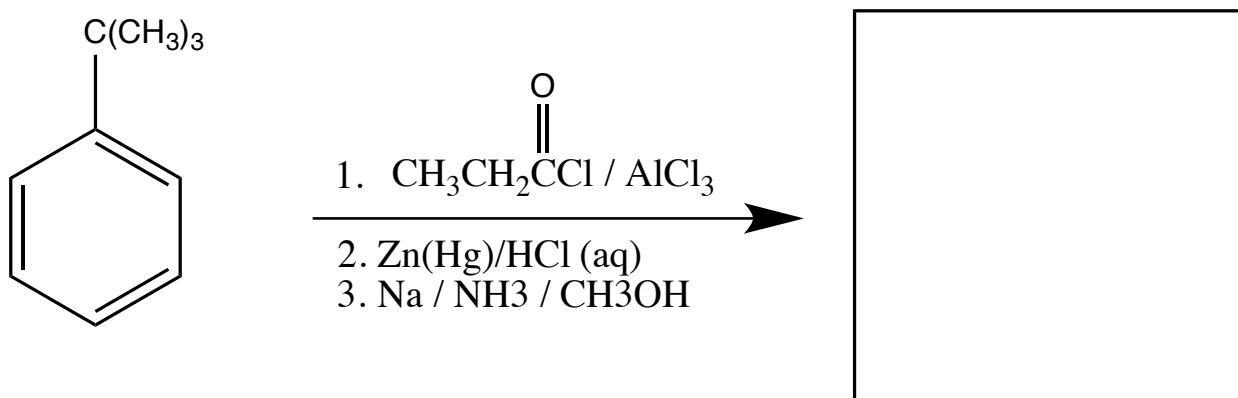
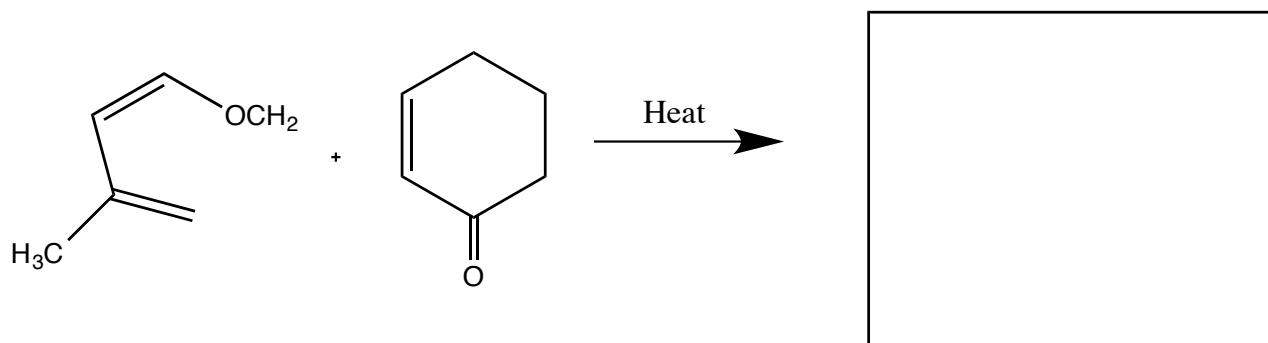
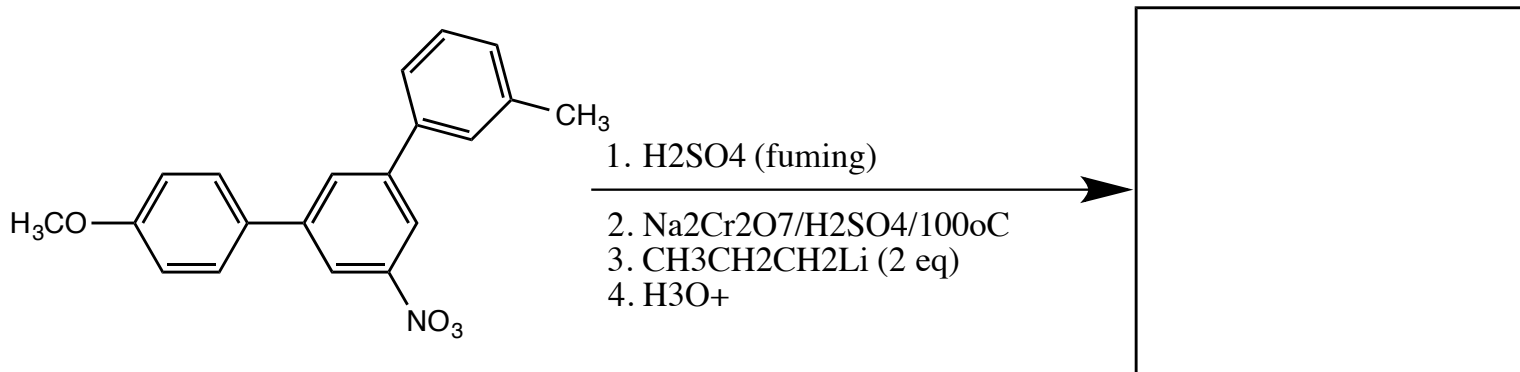


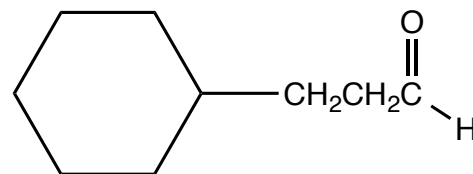
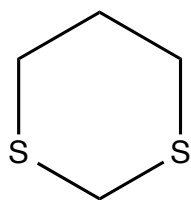
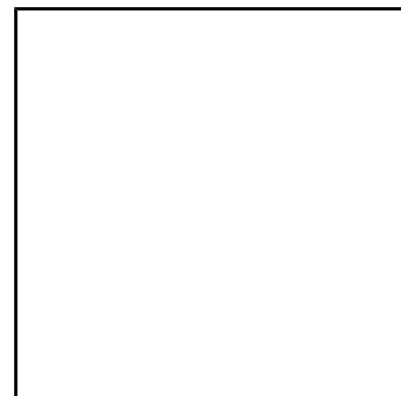
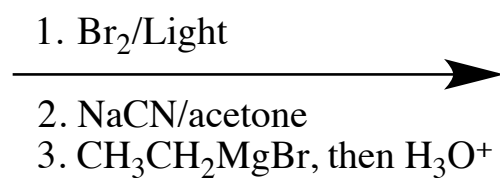
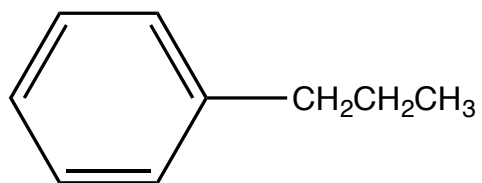
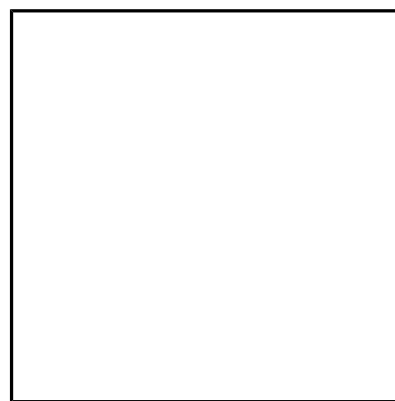
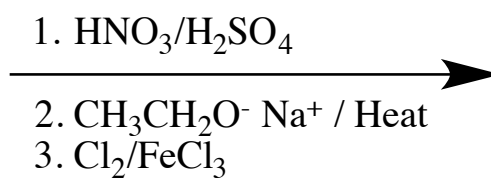
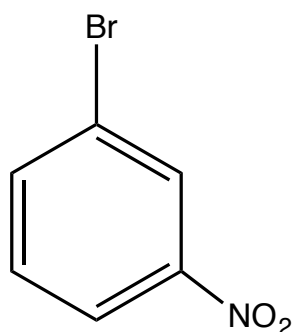
Spring 2015 Exam

C. Reaction: (Total = 36 pts, 6 pts each)

Please provide the reagents or the major product in the answer box. Indicate **stereochemistry** if applicable.

Partial credit is awarded only when intermediate products in a multi-step reaction are shown below the reaction.

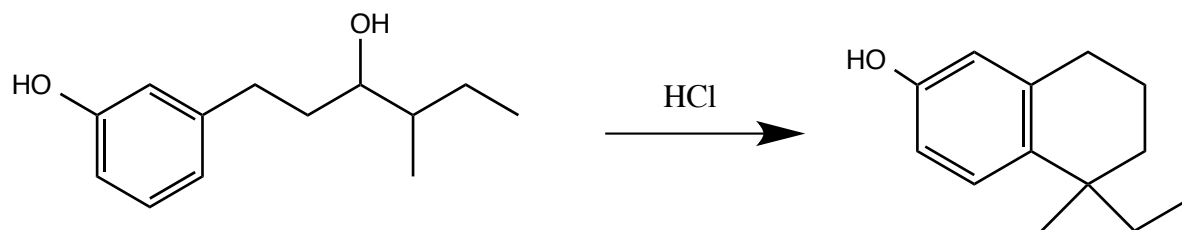




Spring 2015 Exam

D. Mechanism (12 pts)

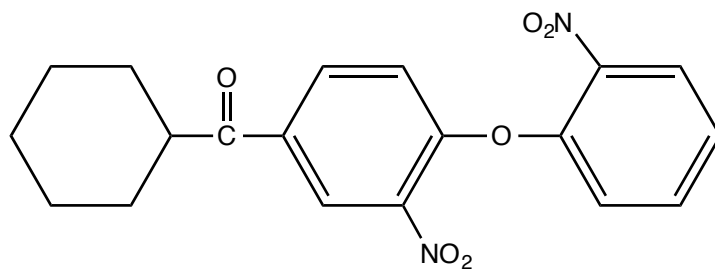
Provide a clear mechanism to explain the formation of the product. Use curved arrows to indicate "electron flow". **Show all intermediate and all formal charges. When more than one resonance contributor may be drawn, be sure to draw the most stable contributor.**



Spring 2015 Exam

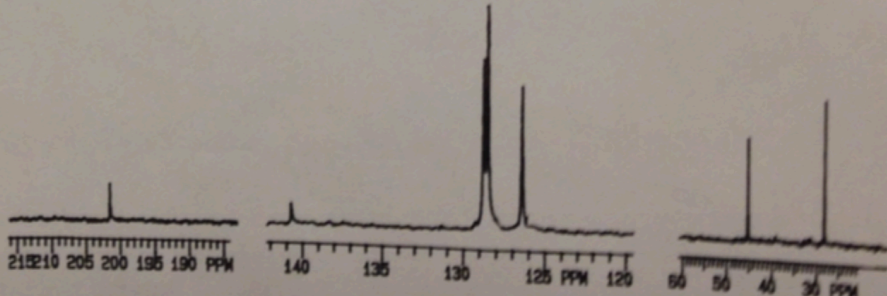
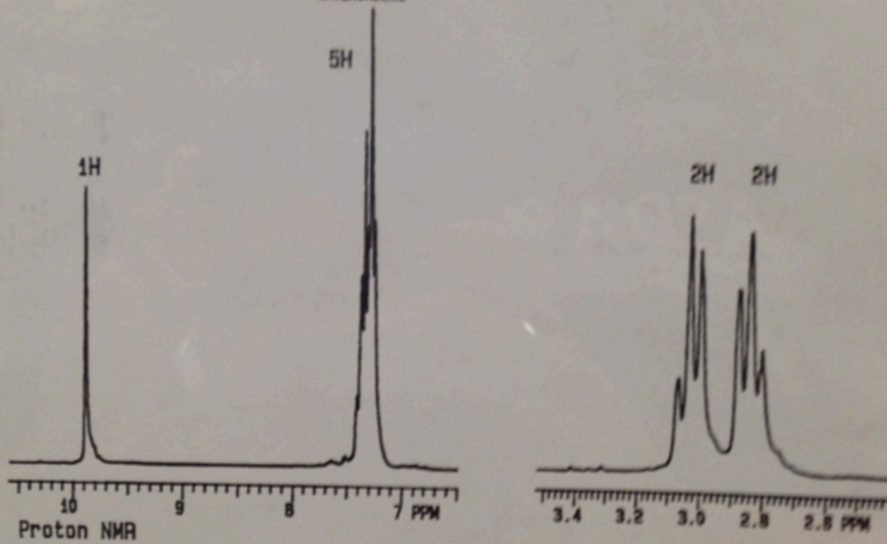
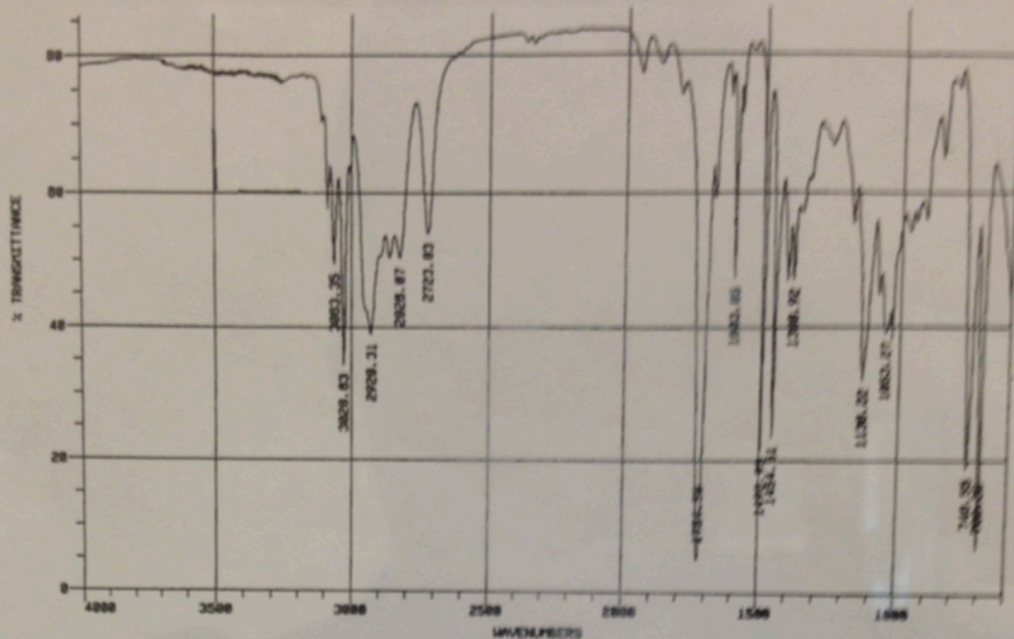
E. Synthesis (12 pts)

Synthesize the molecule below using **benzene, cyclohexane, methanol**, any inorganic reagents, and any oxidizing or reducing agents.



F. Spectroscopy: 10 Points

A compound with the formula $C_9H_{10}O$ 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.



Partial credit:

