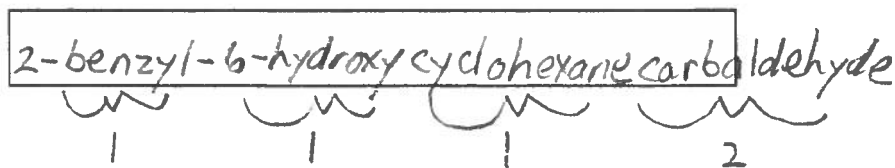
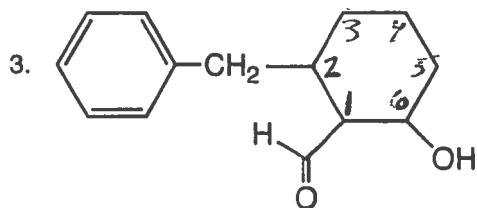
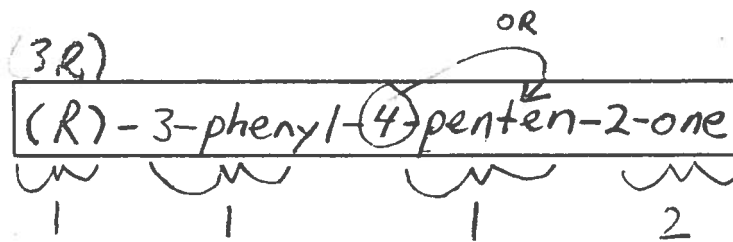
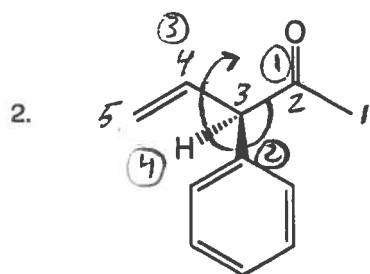
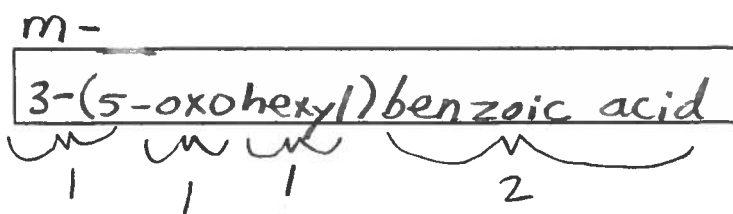
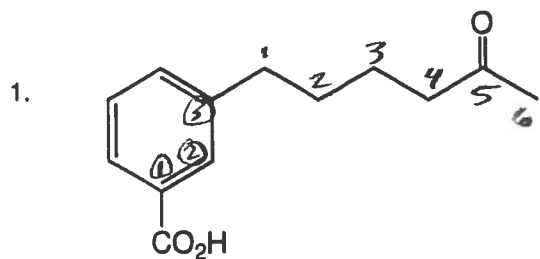


Sp. Alt. EXAM 2

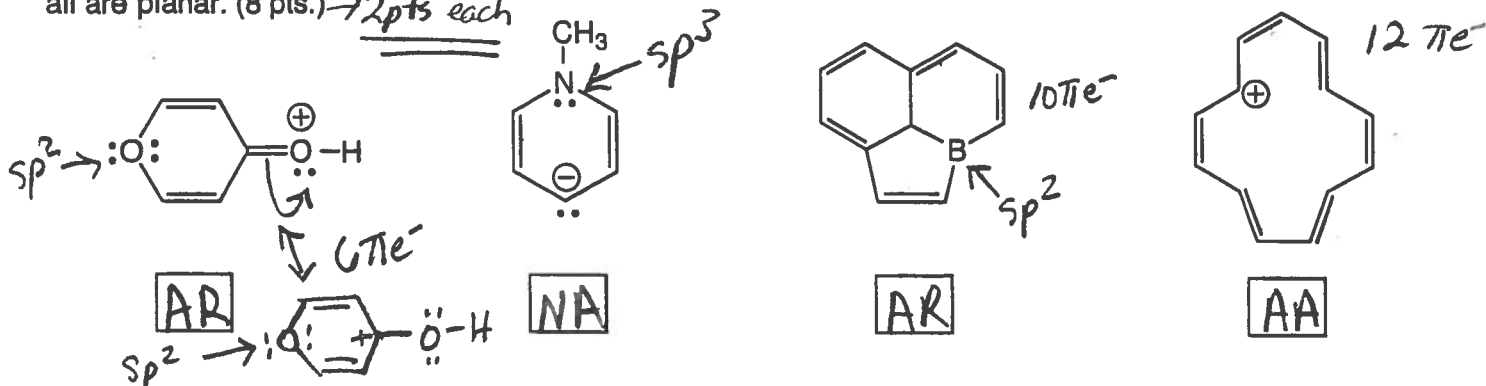
A. Nomenclature: (15 points) 5 pts each

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

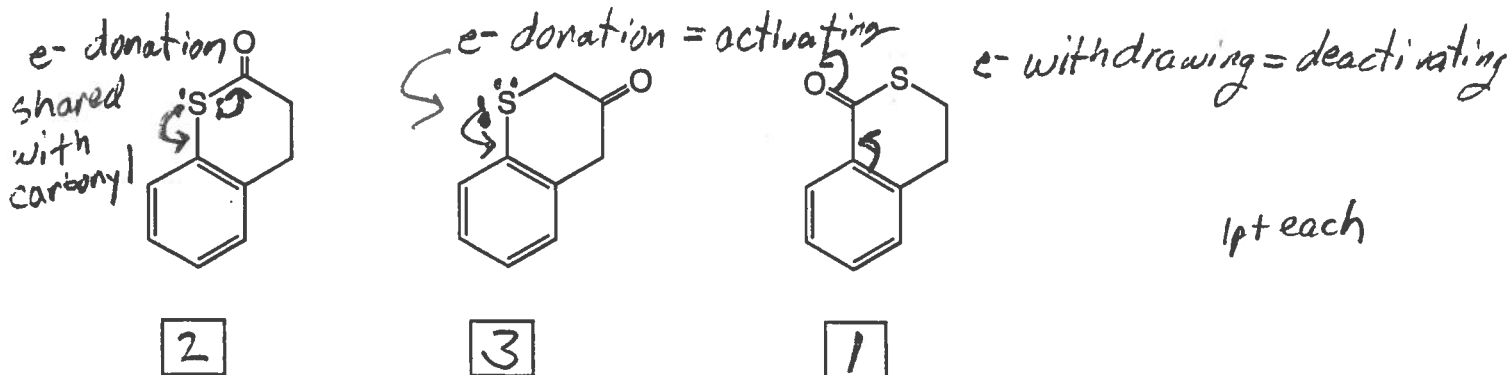


d. Facts: 17 points

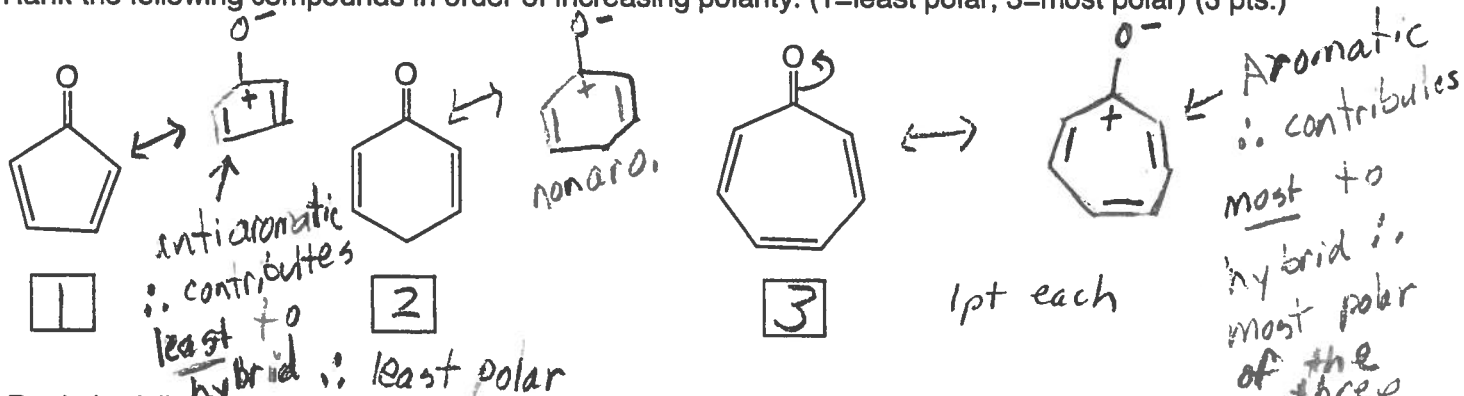
1. Label the molecules below as aromatic (AR), antiaromatic (AA), or nonaromatic (NA). Please assume all are planar. (8 pts.) → 2pts each



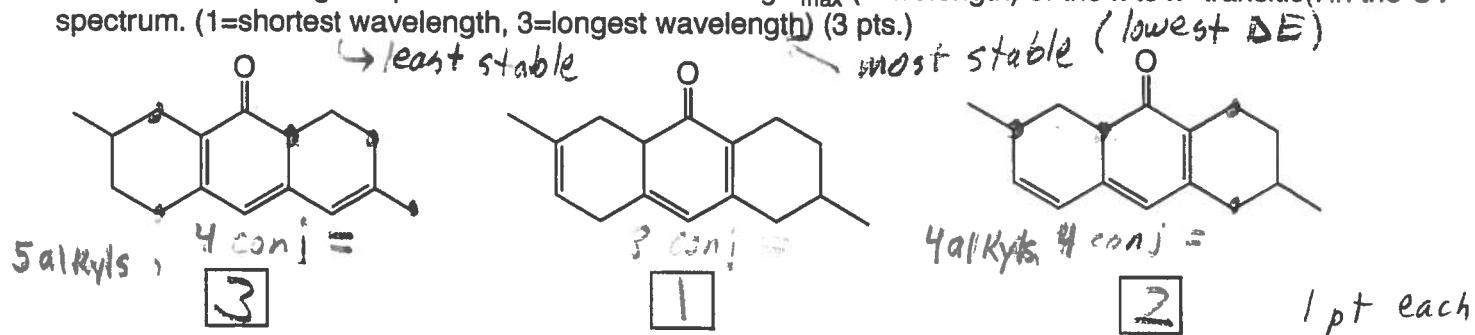
2. Rank the following substituted benzene compounds in order of increasing reactivity by electrophilic aromatic substitution with $\text{Br}_2/\text{FeBr}_3$. (1=least reactive, 3=most reactive) (3 pts.)



3. Rank the following compounds in order of increasing polarity. (1=least polar, 3=most polar) (3 pts.)

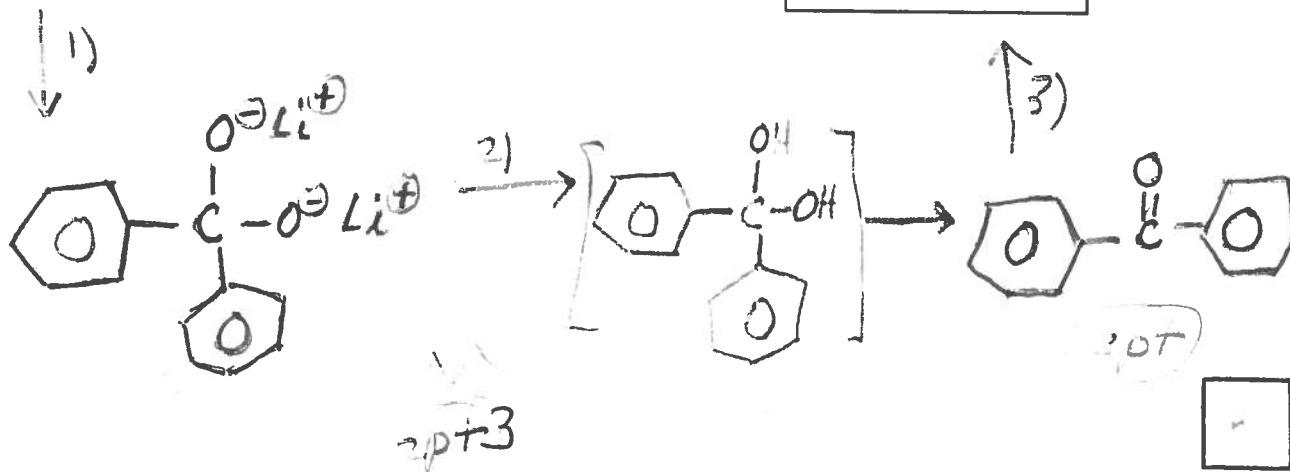
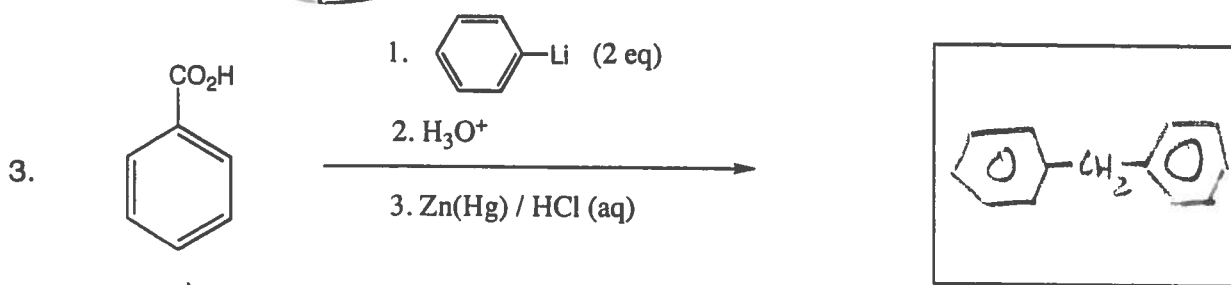
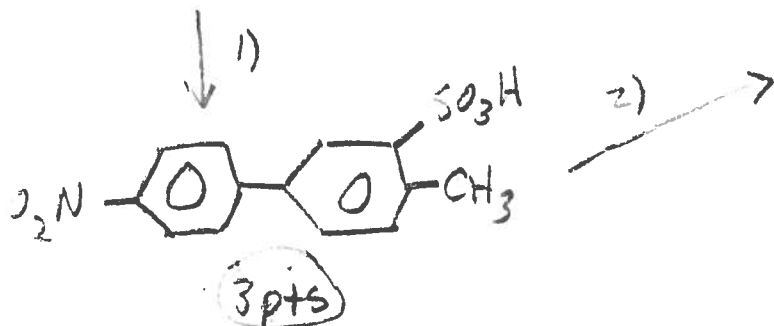
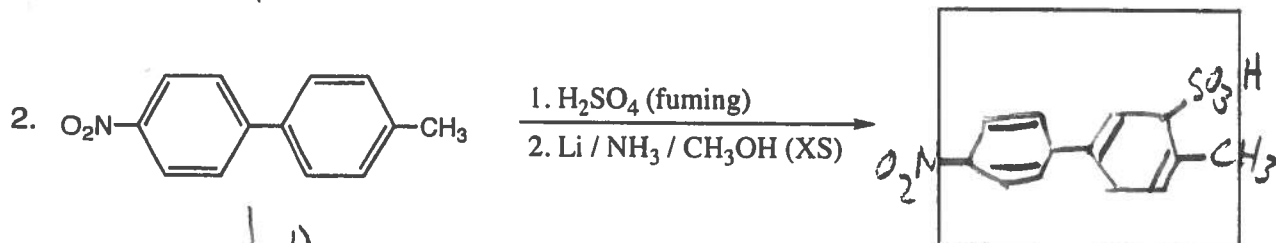
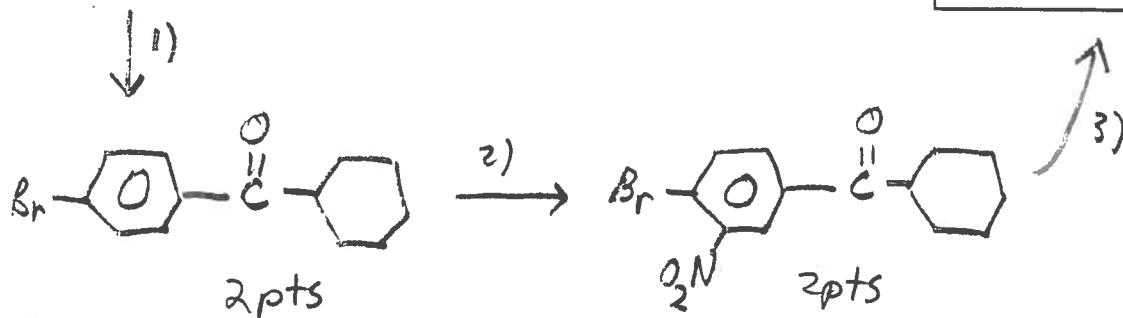
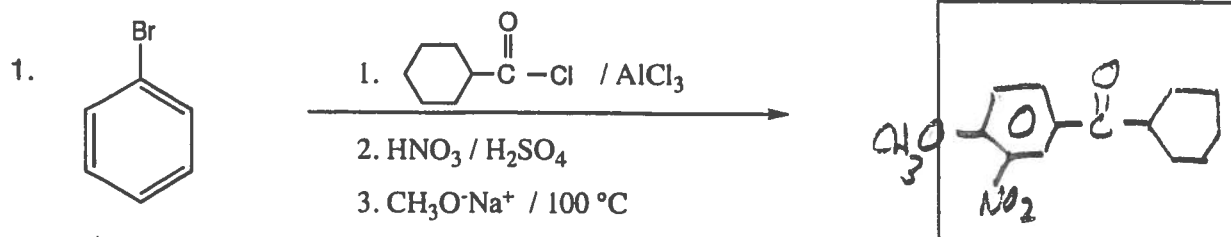


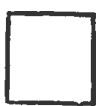
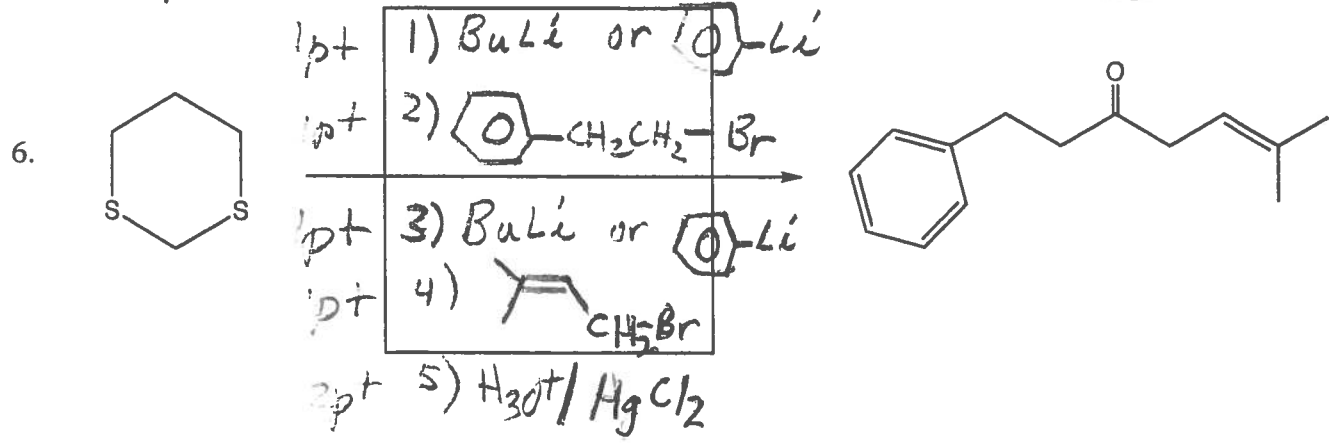
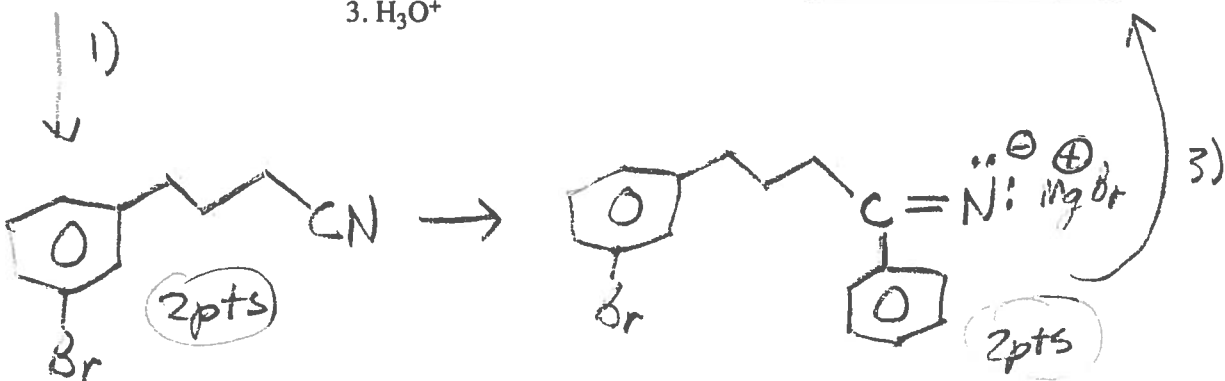
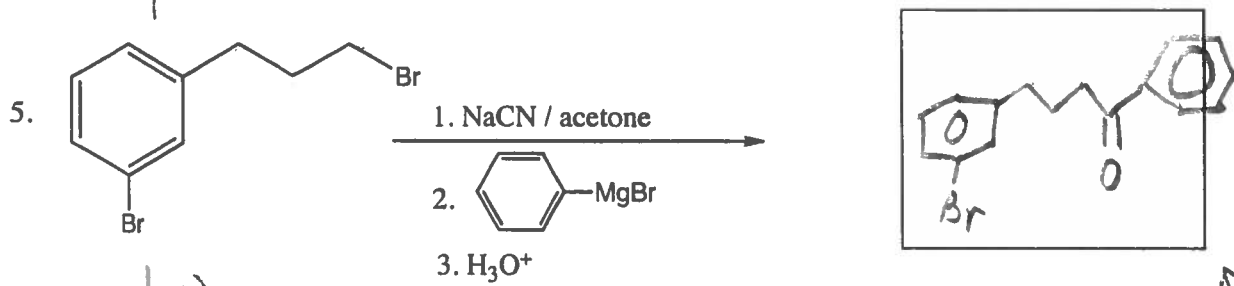
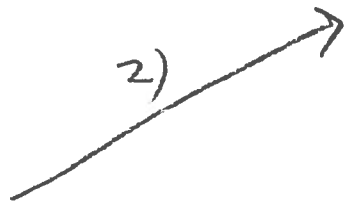
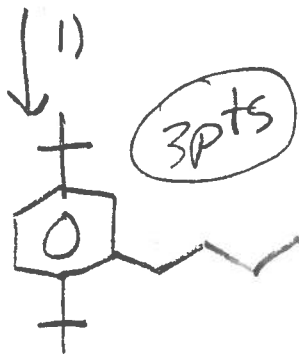
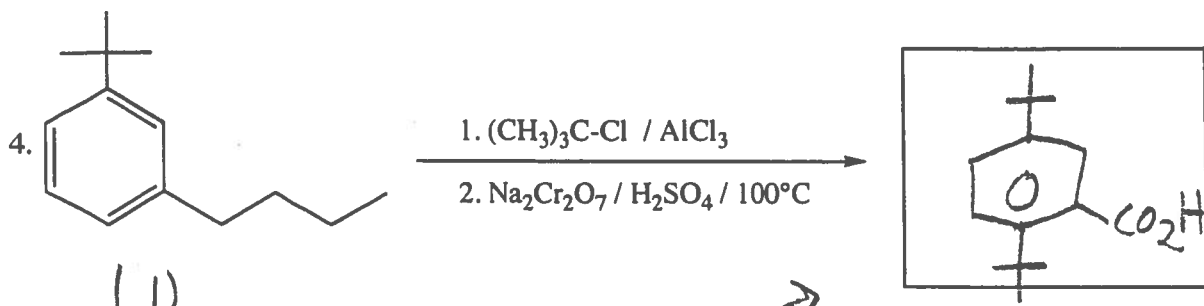
4. Rank the following compounds in order of increasing λ_{max} (wavelength) of the $\pi \rightarrow \pi^*$ transition in the UV spectrum. (1=shortest wavelength, 3=longest wavelength) (3 pts.)



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

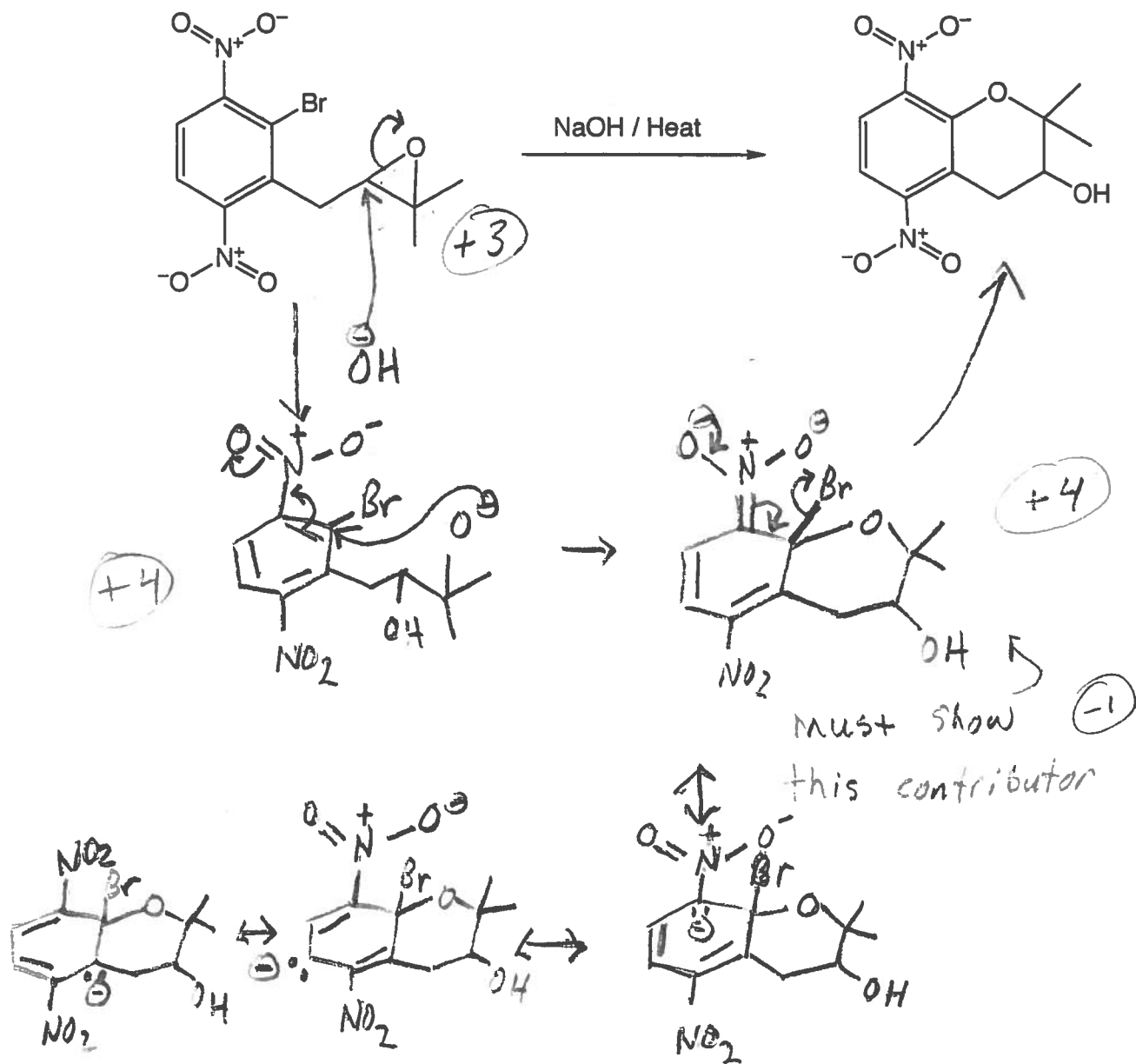
Please provide the reagents or major product in the answer box. Indicate **stereochemistry** if applicable. Partial credit is awarded only when intermediate products in a multi-step reaction are shown below the reaction.





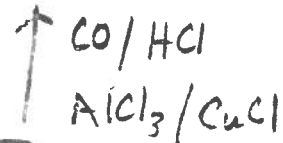
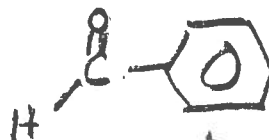
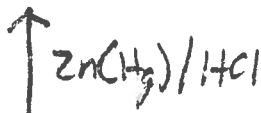
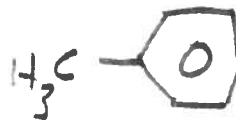
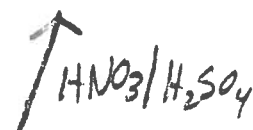
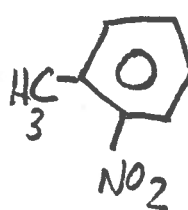
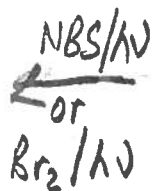
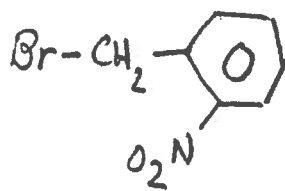
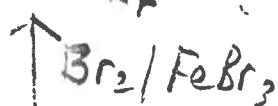
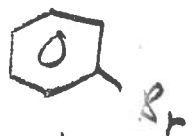
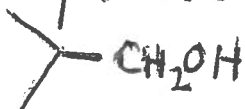
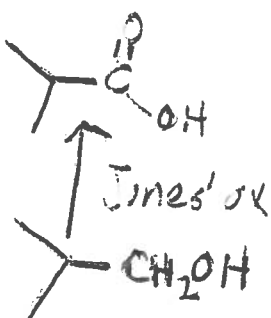
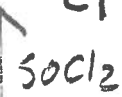
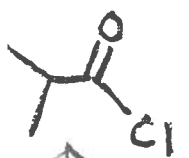
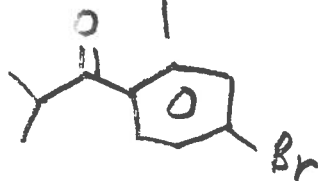
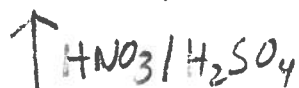
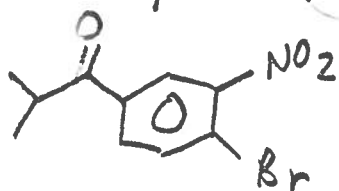
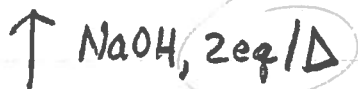
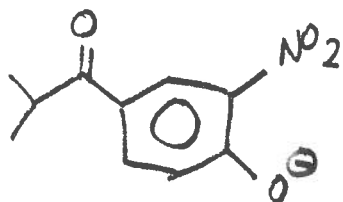
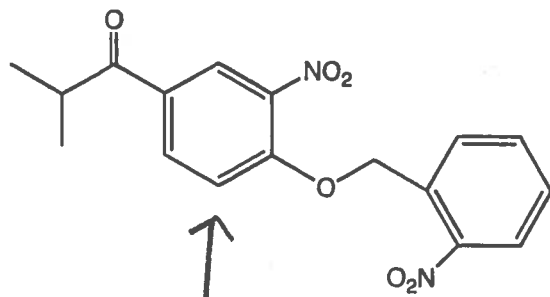
D. Mechanism: (11 points)

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



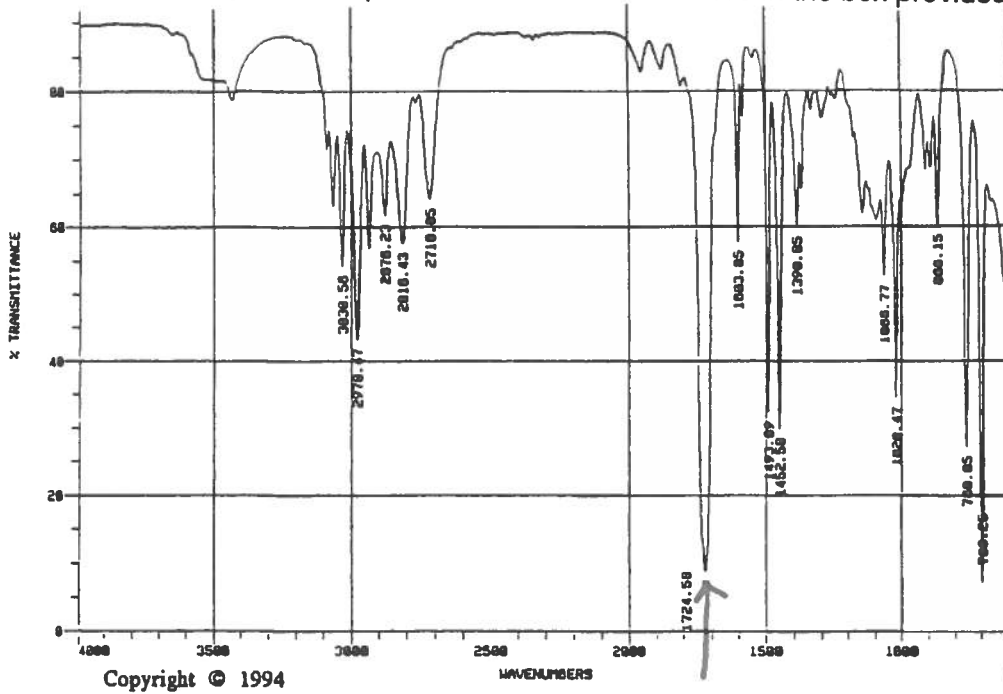
E. Synthesis: 11 Points

Synthesize the molecule below using **benzene**, alcohols of four carbons or less, any inorganic reagents, any oxidizing or reducing agents, and any peroxyacids.



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.



*Coupling with the proton at 9.7 ppm is not observed due to a very small coupling constant.

C=O NOT conjugated 3H

