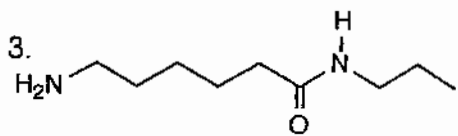
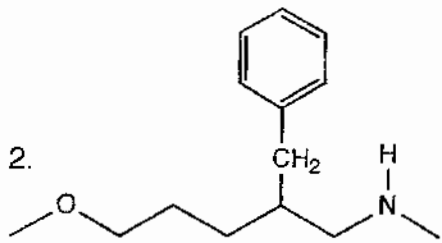
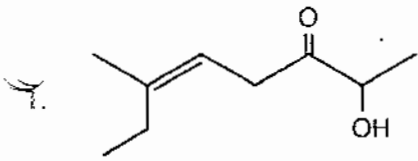


A. Nomenclature: Total = 12 points, 4 points each

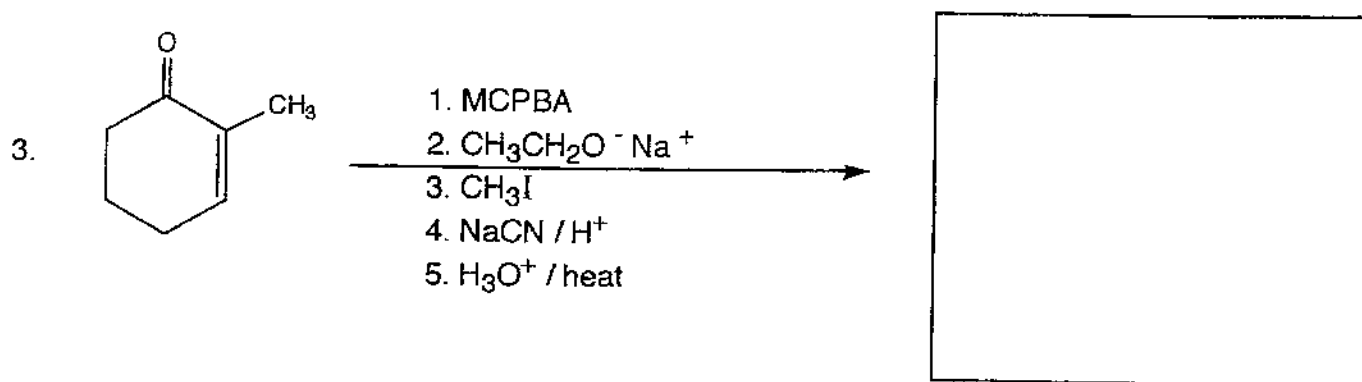
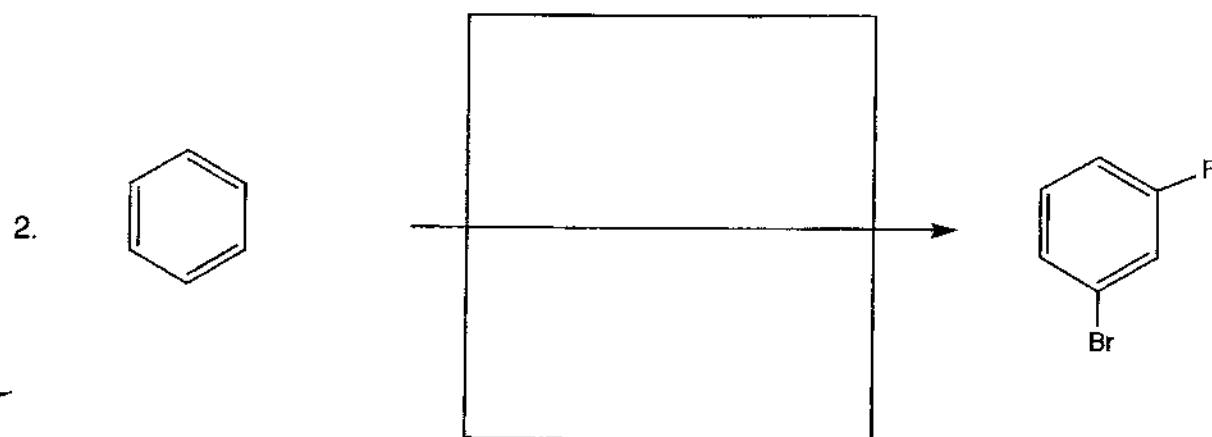
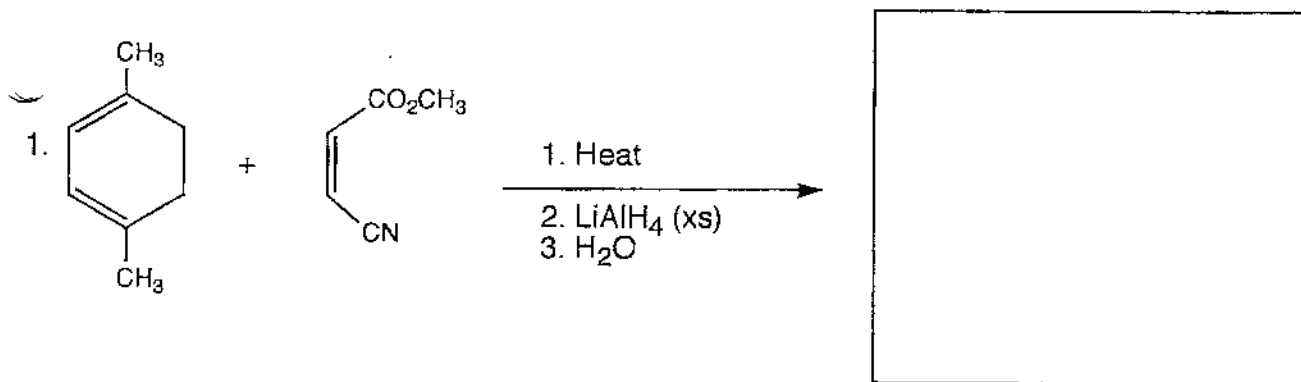
Bean-Cai-4
Chem 3332

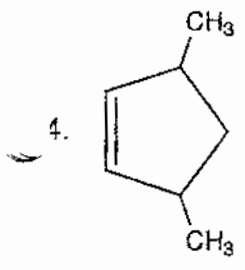
Give an acceptable name for each of the compounds below.



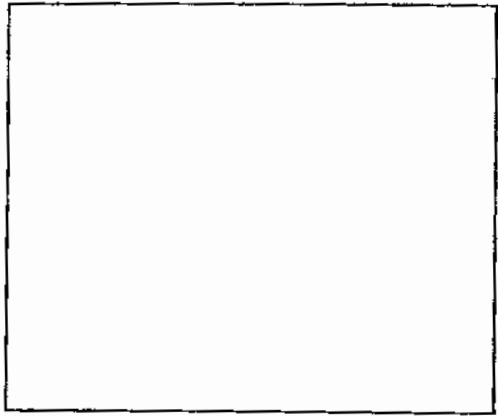
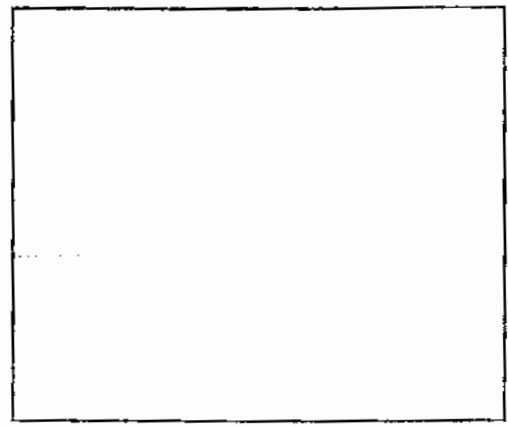
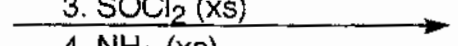
B. Reactions: Total = 40 points, 8 points each

Please provide the starting material, major product or necessary reagents in the answer box. Be sure your drawing indicates stereochemistry if applicable. Partial credit is awarded only when intermediate products are shown below the reaction.

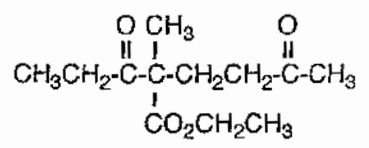




1. $\text{KMnO}_4 / ^-\text{OH} / \text{heat}$
2. H^+
3. SOCl_2 (xs)
4. NH_3 (xs)
5. $\text{Br}_2 / ^-\text{OH} / \text{H}_2\text{O}$ (xs)

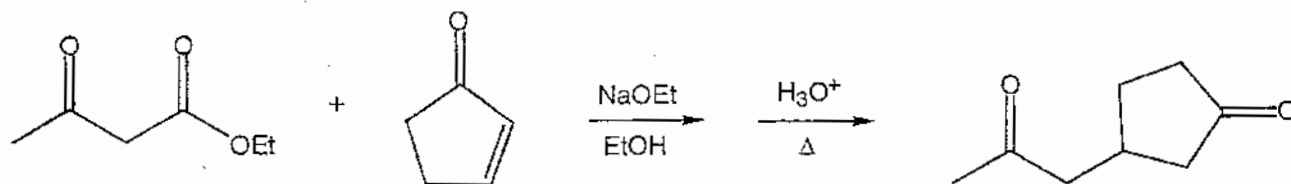


1. $\text{CH}_3\text{CH}_2\text{O}^- \text{Na}^+ / \text{EtOH}$
2. H_3O^+
3. $\text{CH}_3\text{CH}_2\text{O}^- \text{Na}^+ / \text{EtOH}$
4. $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}=\text{CH}_2$



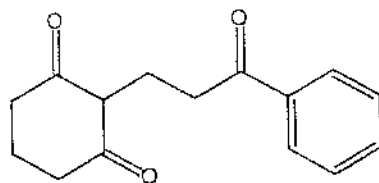
C. Mechanism: (18 points)

Provide reasonable mechanisms for the reaction below. Use curved arrows to indicate "electron flow". Show all intermediates and all formal charges. If there is more than one resonance structure, you must show the "best" (i.e., lowest energy) structure.



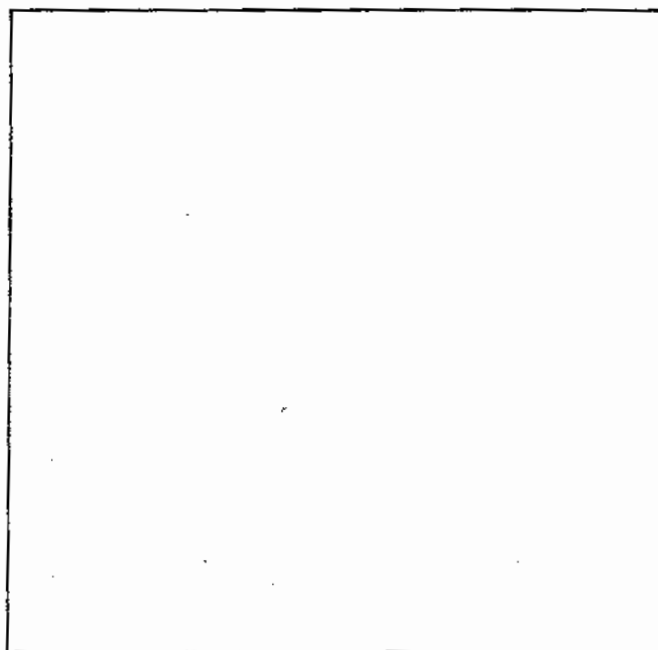
D. Synthesis: (18 points)

Synthesize the molecule below using any of the following reagents: alkanes, alkenes, alkynes, or alcohols of two **carbons or less**, benzene, any inorganic reagents, any oxidizing or reducing agents, and any peroxyacids.



E. Spectroscopy: (12 Points)

A compound with the formula $C_{10}H_{12}O_3$ exhibits the IR, 1H NMR, and proton-decoupled ^{13}C NMR spectra shown on the following page. Please identify this compound and draw the structure in the box provided below.

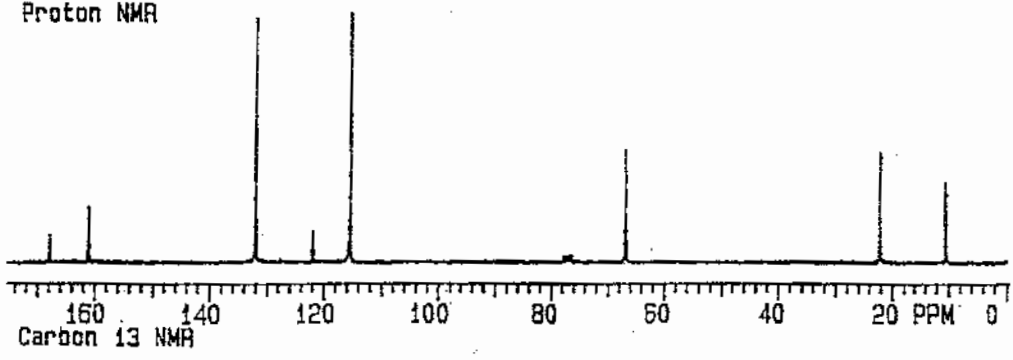
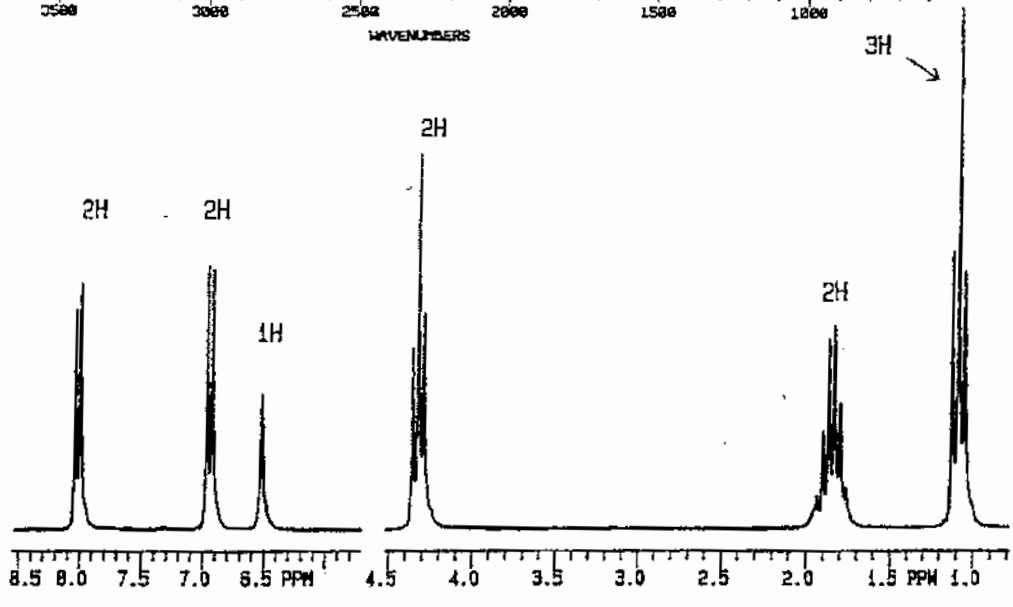
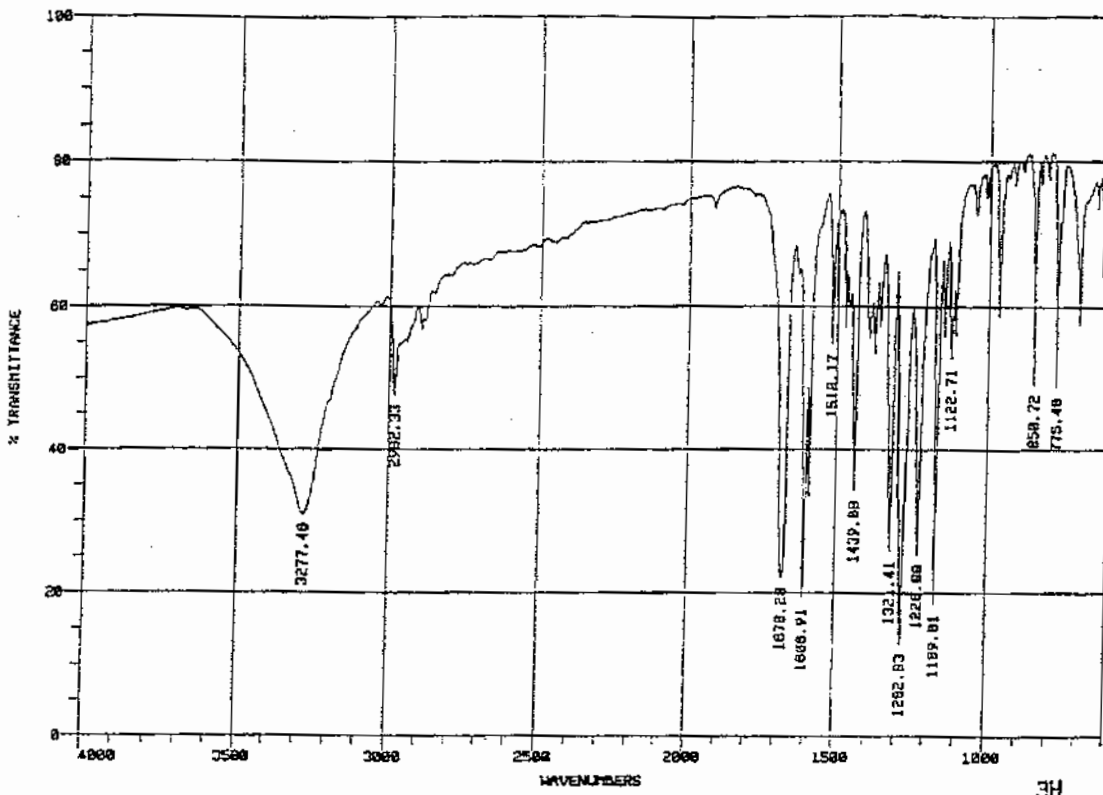


MF C₁₀H₁₂O₃

MW 180

%C 66.7

%H 6.7



7

