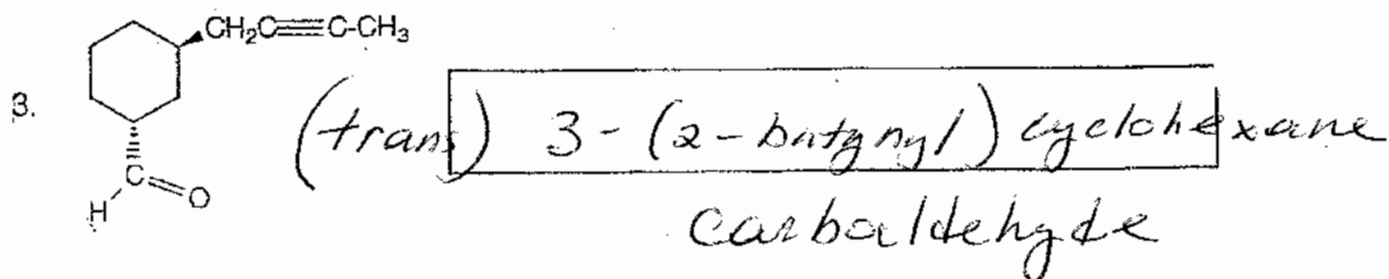
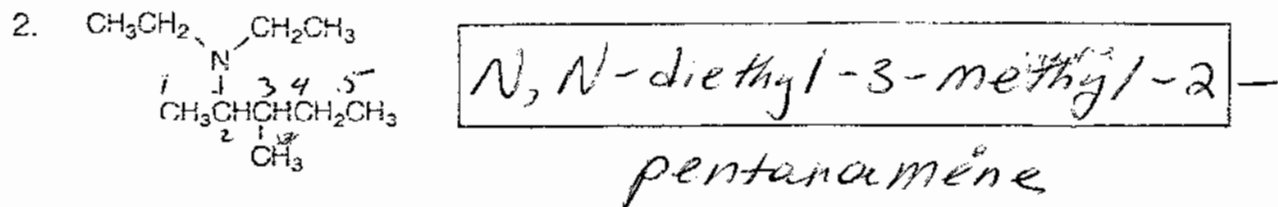
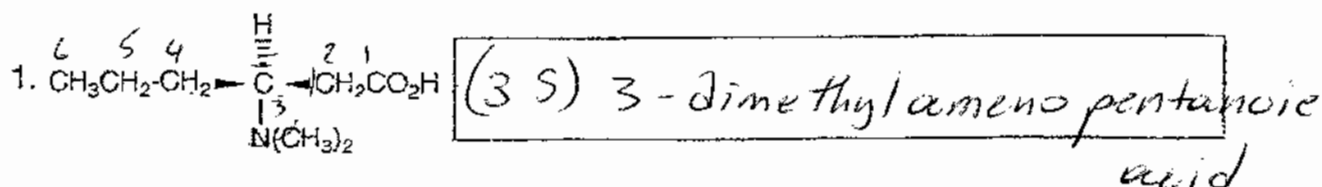


Final E  
Final Exam

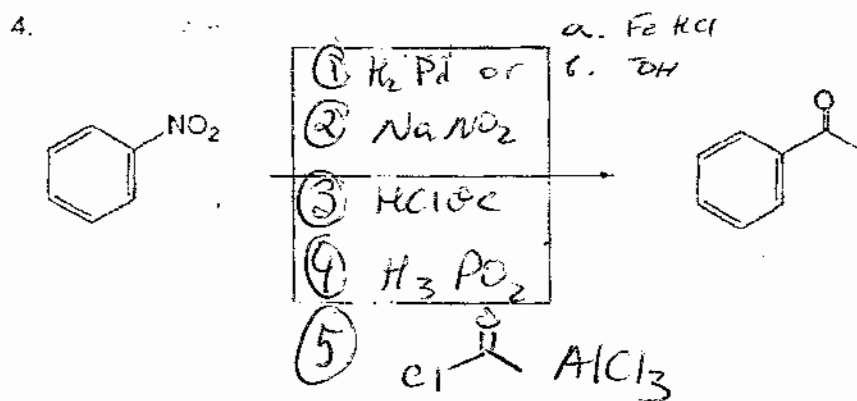
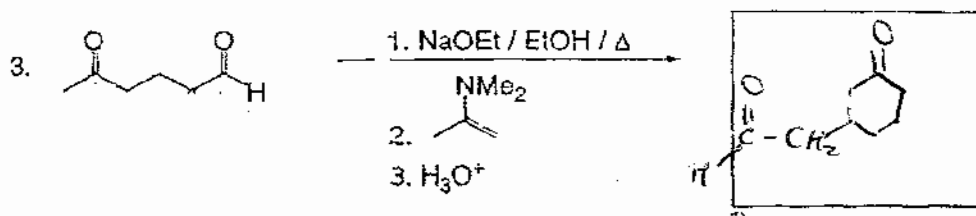
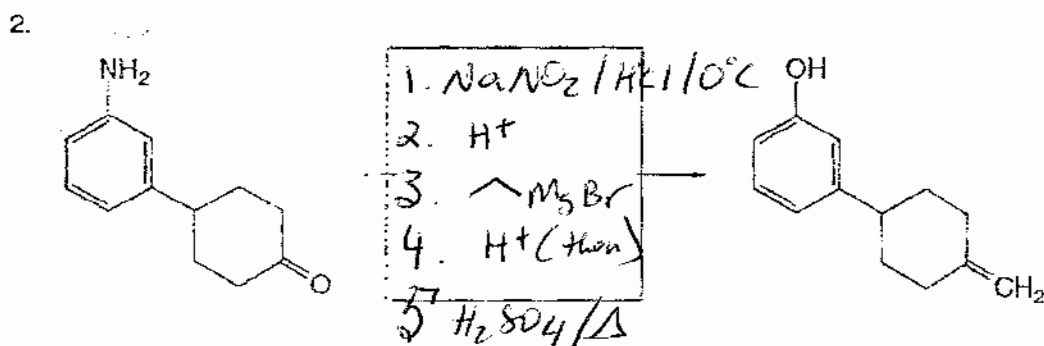
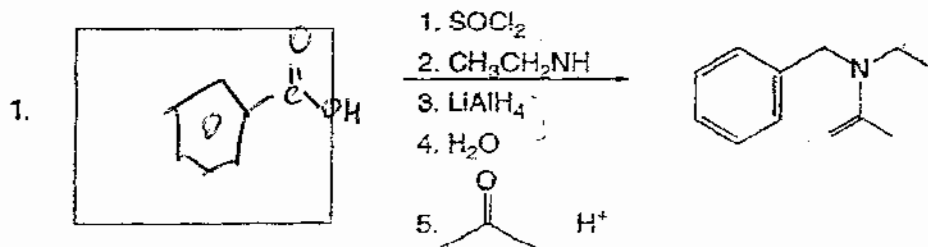
A. Nomenclature: Total = 9 points, 3 points each

Please provide an acceptable name for each of the following compounds, noting stereochemistry where appropriate.

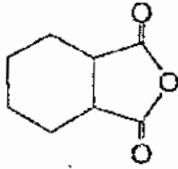


**B. Reactions (7 points each problem; 49 points total)**

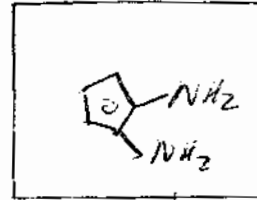
Please provide the major product, or necessary reagents, or starting material in the box provided below. Be sure your drawing indicates stereochemistry if applicable.



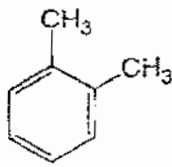
5.



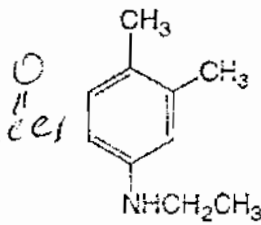
1.  $\text{H}_3\text{O}^+$
2.  $\text{SOCl}_2$  (xs)
3.  $\text{NH}_3$  (xs)
4.  $\text{Cl}_2$  (xs) /  $\text{NaOH}$  /  $\text{H}_2\text{O}$



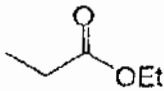
6.



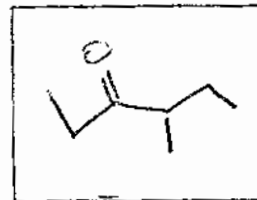
1.  $\text{HNO}_3 / \text{H}_2\text{SO}_4$
2.  $\text{H}_2 / \text{Pd}$
3.  ~~$\text{CH}_3\text{COCl}$~~   $\text{CH}_3\text{COCl}$
4.  $\text{LiAlH}_4$
5.  $\text{H}_2\text{O}$



7.

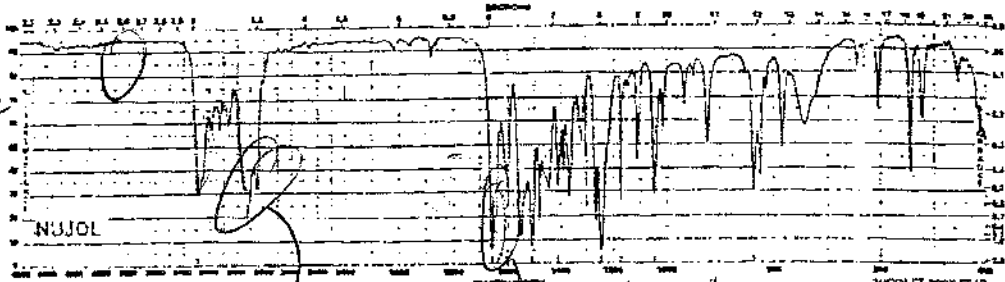


1.  $\text{NaOEt} / \text{EtOH}$
2.  $\text{H}_3\text{O}^+$
3.  $\text{NaOEt} / \text{EtOH}$
4.  $\text{EtBr}$
5.  $\text{H}_3\text{O}^+ / \Delta$



**C. Spectroscopy: 10 points total**

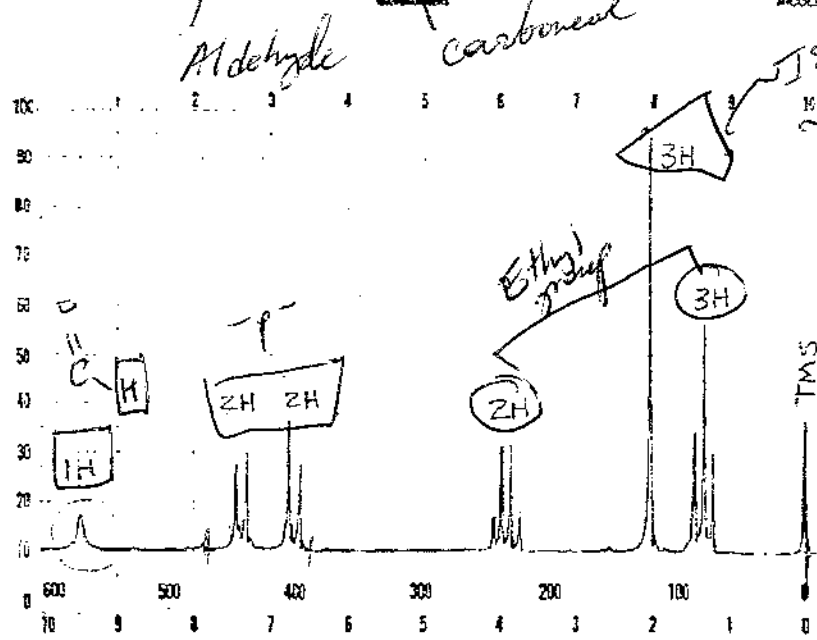
The spectra below were recorded on a compound whose molecular formula is  $C_{10}H_{13}NO_2$ . Please draw the structure of the substance in the box provided below.



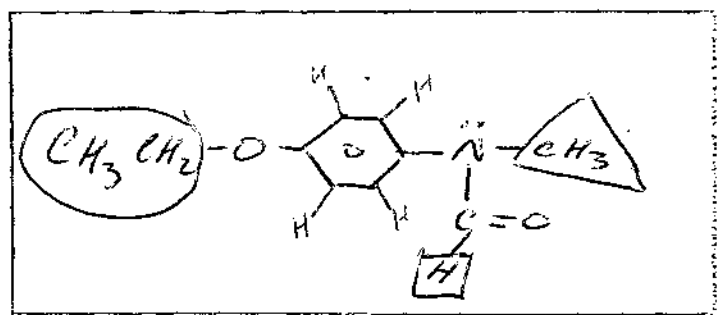
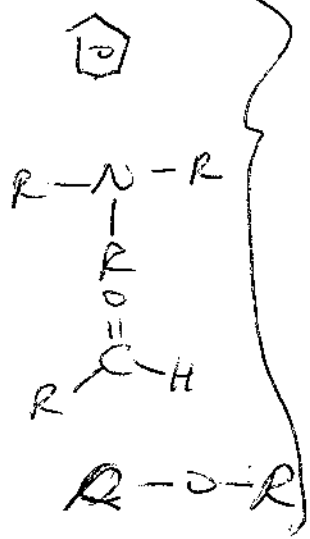
$$\frac{22 - 13 + 1}{2} = 5$$

5 degrees of freedom

Groups involved before we even look at NMR



2 O's  
one  $C=O$   
NO OH - bc



Look and compare products to reactants

D. Mechanism: (16 pts total)

1. Provide a clear mechanism for the following reaction. Use curved arrow notation to indicate "electron flow". Show all intermediates and all formal charges. (10 points)

