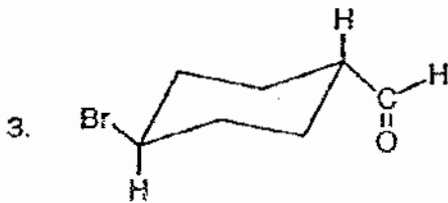
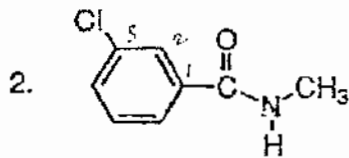
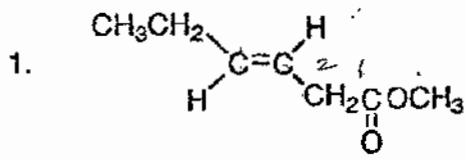


# Final D

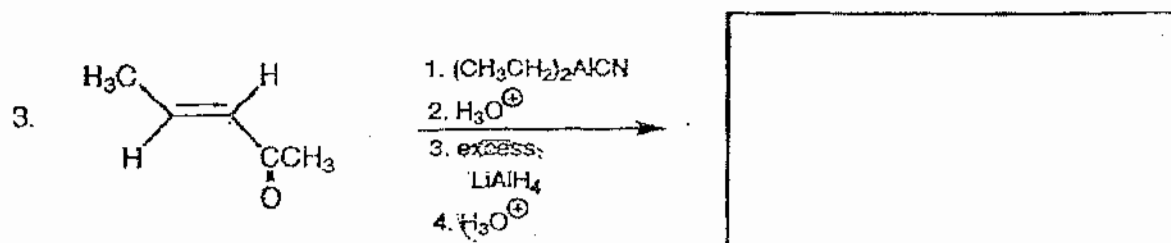
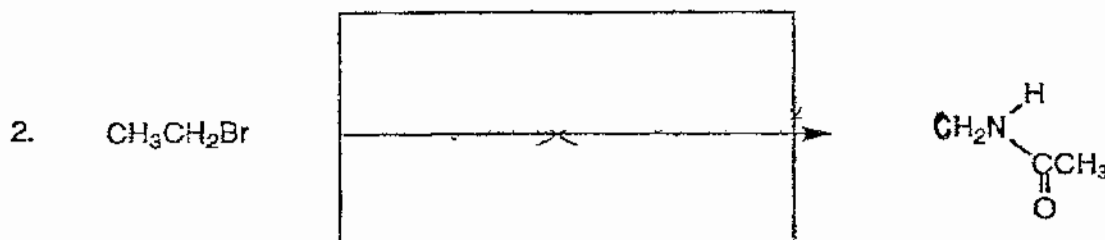
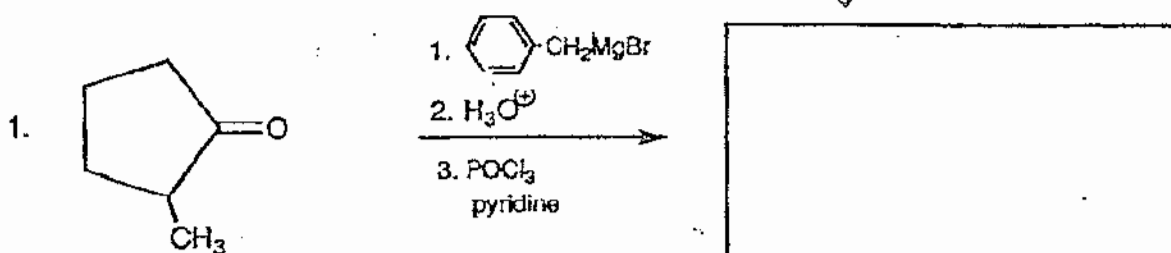
## A. Nomenclature (9 points)

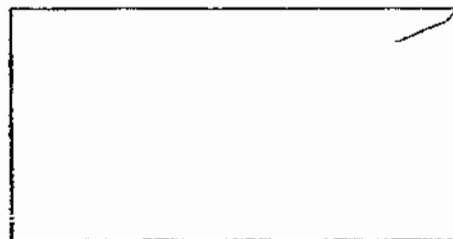
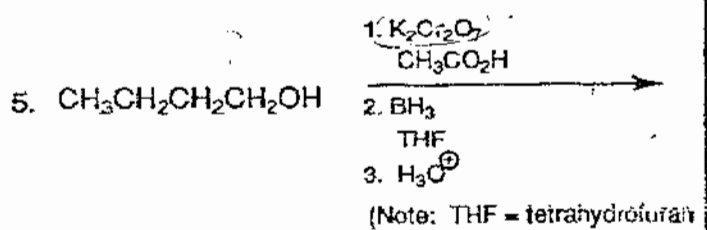
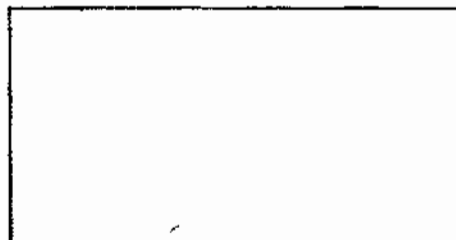
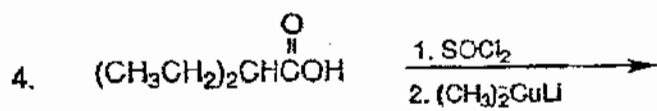
Please provide an acceptable IUPAC name for the following compounds.



3. Reactions (7 points each, total: 35 points)

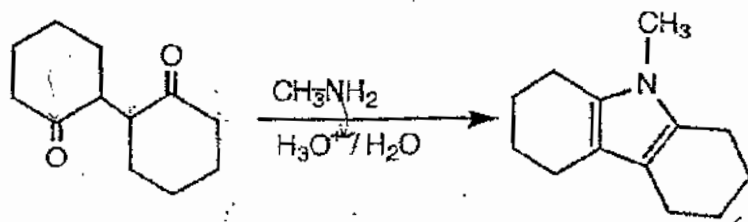
Please give the major product, or necessary reagents, or starting material for each of the following reactions in the box provided. Be sure your drawing indicates the relative orientation of the substituents (i.e., stereochemistry) in the molecule.





**C. MECHANISM : (18 points)**

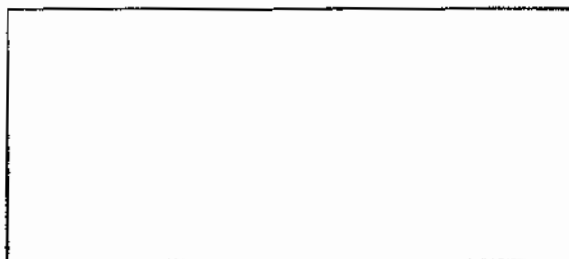
Provide a detailed step-by-step mechanism for the transformation below. Draw all intermediates and show movement of all electrons with "curved arrows".

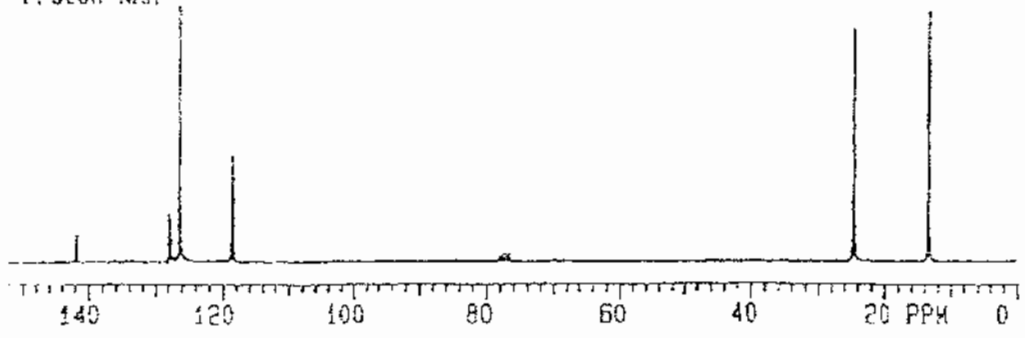
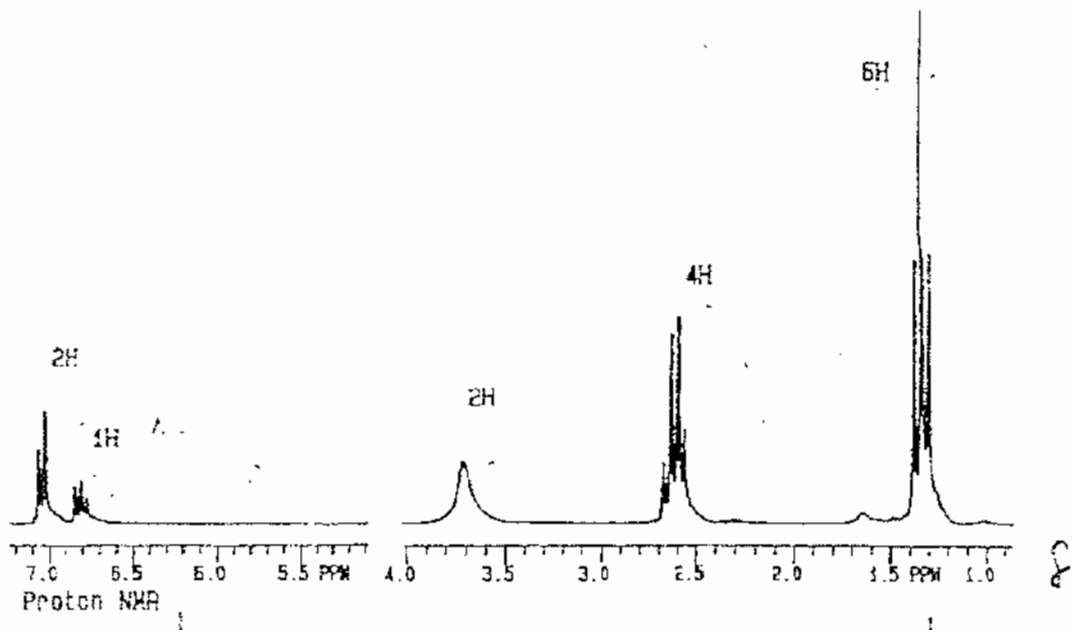
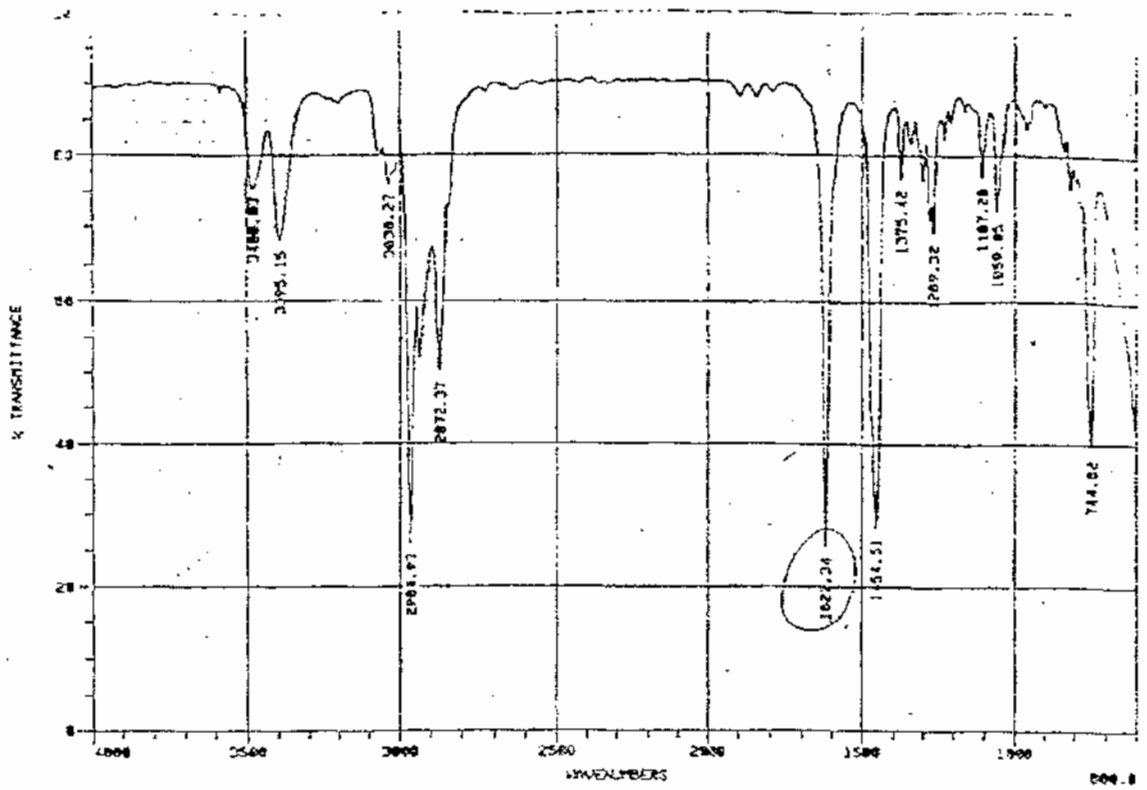


7

D. Spectroscopy (10 points)

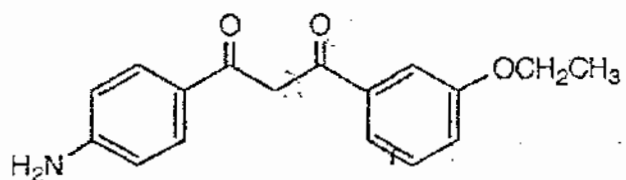
Molecule A whose formula is  $C_{10}H_{15}N$  has the following IR,  $^1H$  NMR and  $^{13}C$  NMR spectra (see next page "A"). In the  $^1H$  NMR spectrum the numbers above (near) the signals refer to the relative proton integration ratios. Please give the structure of A in the box provided.





**E. Synthesis : (18 points)**

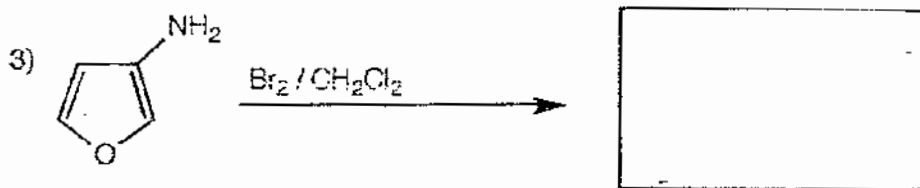
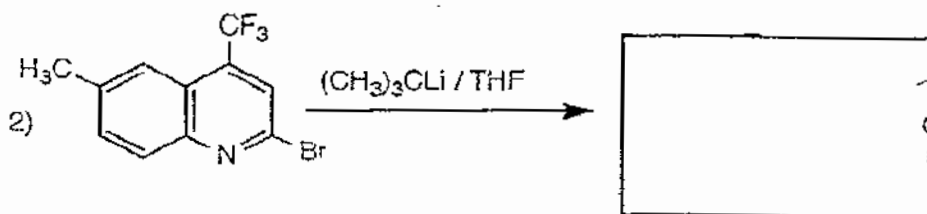
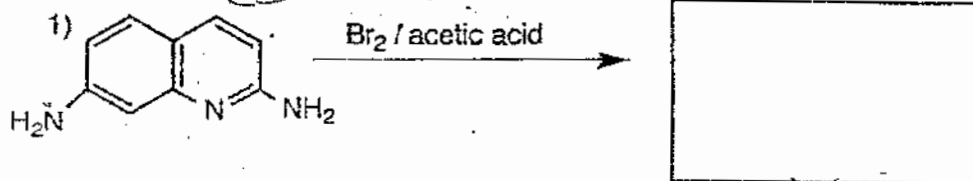
Starting with benzene, any one or two carbon alcohol, and any inorganic reagents, synthesize the following compound:



**F. Professor's Pot Luck : (10 points)**

The following section contains three questions, each worth 10 points. The questions may or may not contain multiple parts. Answer **one** question only! Omit the other two. Only **one** question will be graded. If you attempt more than one, be sure to **mark out** the question you do not want graded. Otherwise, the first question answered will be graded and the second question will be ignored.

F1. A. Give the major product for each of the following reactions (3 pts. each):



B. Of the three starting materials above, which is the most reactive in electrophilic aromatic substitution reactions? Place your answer in the box provided. (1 pt.)





F-2. Special Question (10 points)

Unlike mammalian cells, bacteria can utilize D-amino acids. Since natural amino acids have the L-configuration bacteria must convert the L-amino acids to their enantiomers. This process is accomplished with the aid of a biological cofactor (catalyst) called pyridoxyl 5'-phosphate (PLP) and is acid catalyzed. An abbreviated structure of PLP is given as **1** below. Please draw a detailed, step-by-step mechanism for the interconversion of one enantiomer of alanine to another using **1** in water.

