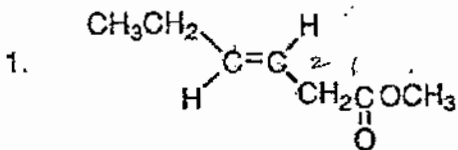


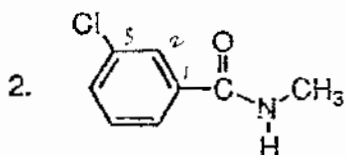
# Final D

## A. Nomenclature (9 points)

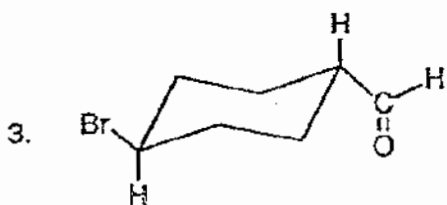
Please provide an acceptable IUPAC name for the following compounds.



methyl (3E)-3-hexenoate



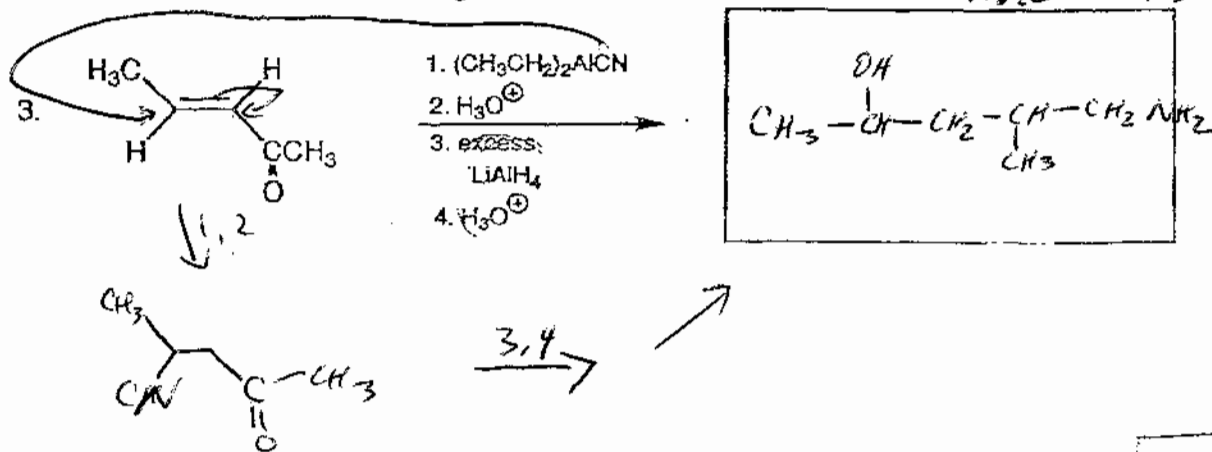
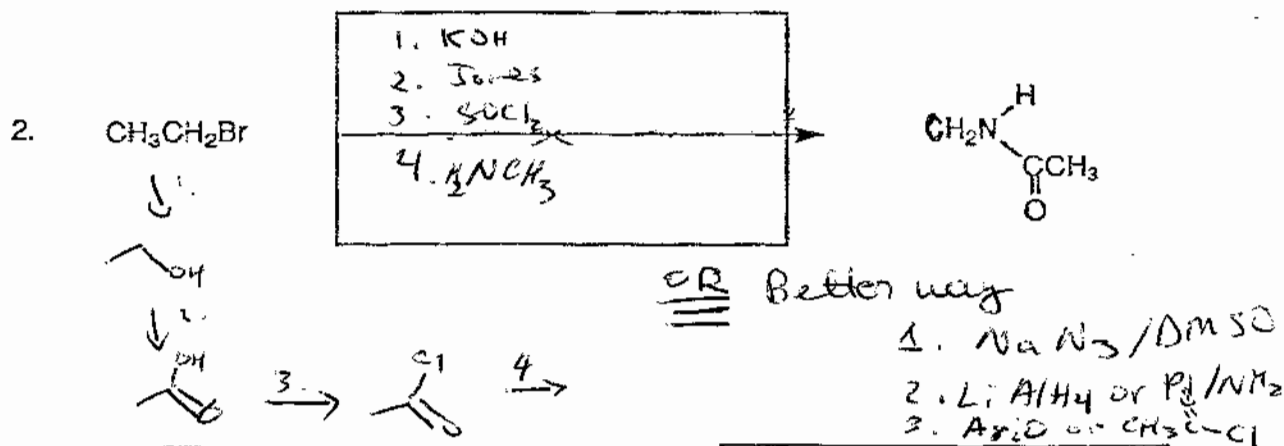
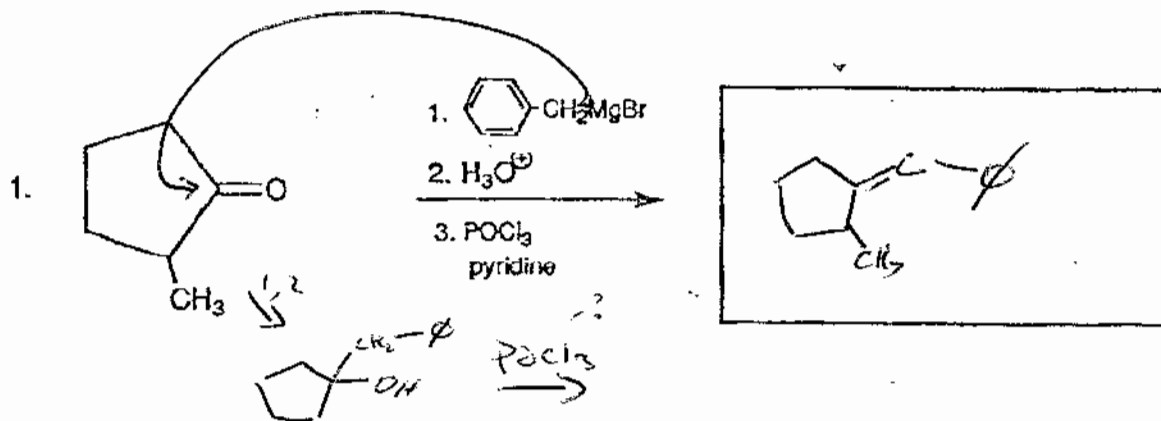
3-chloro-N-methylbenzamide

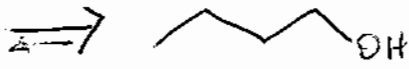
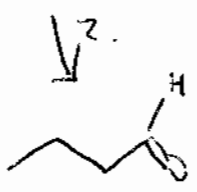
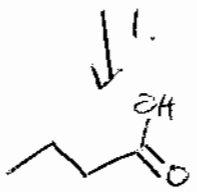
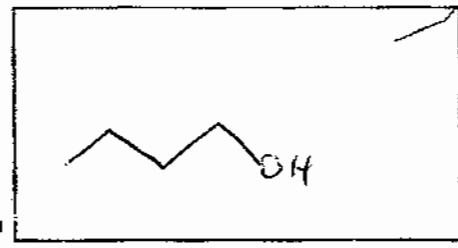
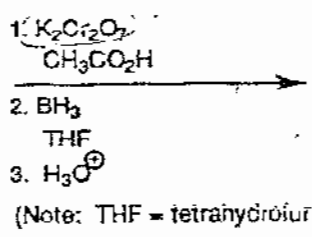
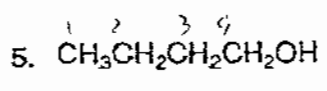
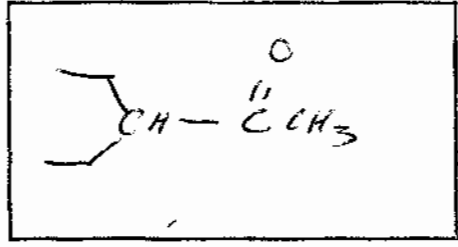
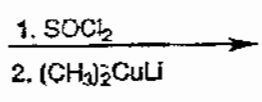
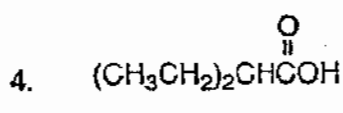


trans-4-bromocyclohexane  
carbaldehyde

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

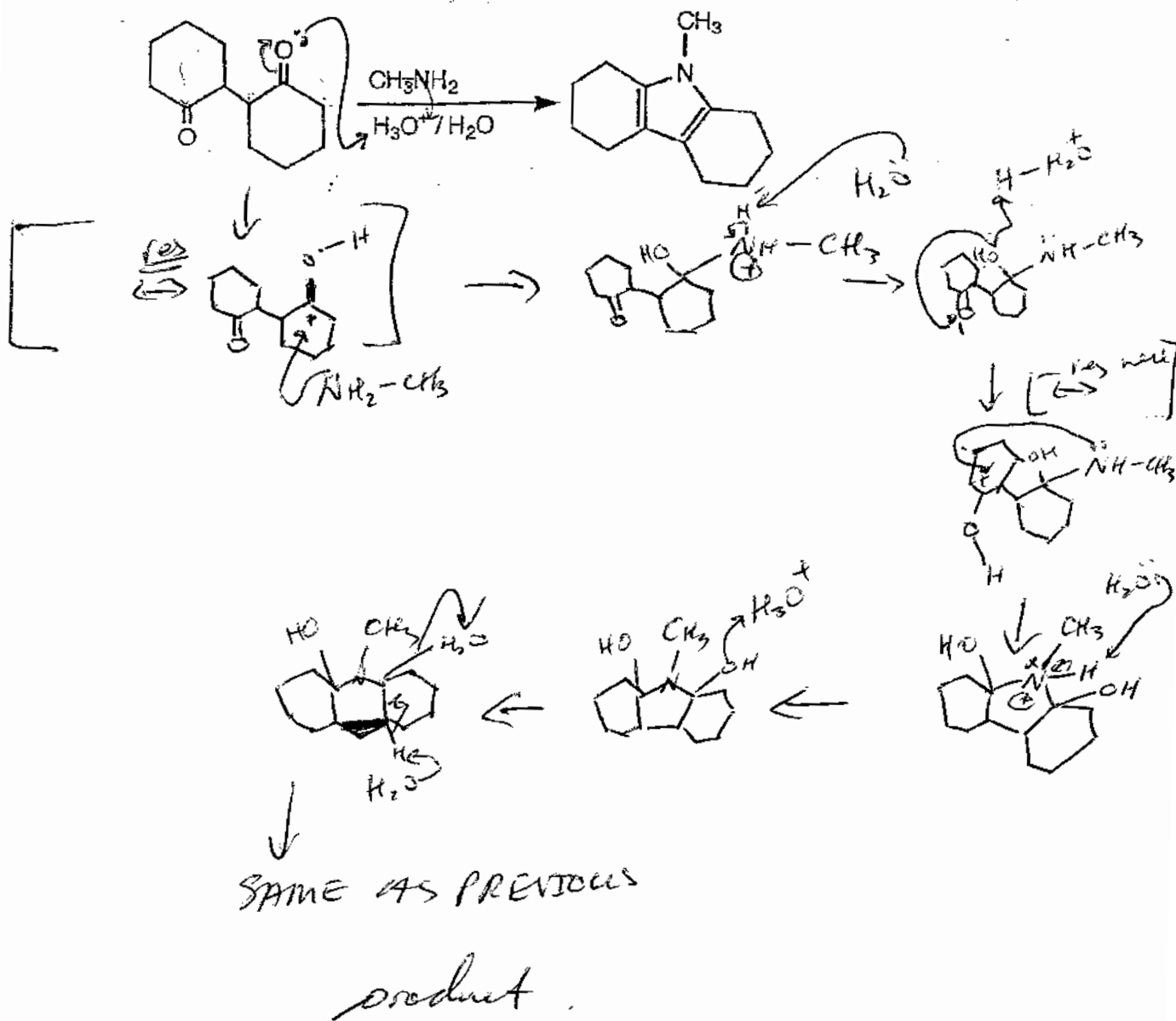
Please give the major product, or necessary reagents, or starting material for each of the following reactions in the box provided. Be sure your drawing indicates the relative orientation of the substituents (i.e., stereochemistry) in the molecule.





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

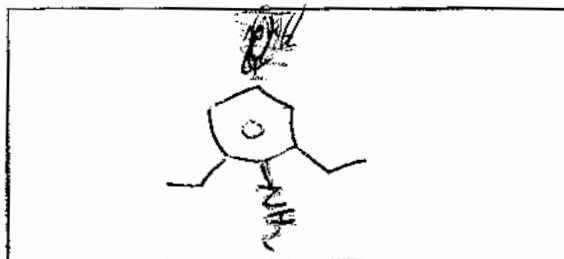
Provide a detailed step-by-step mechanism for the transformation below. Draw all intermediates and show movement of all electrons with "curved arrows".



E

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:

