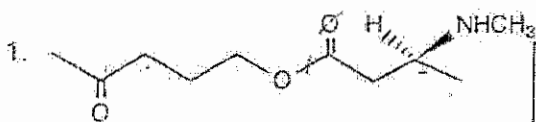


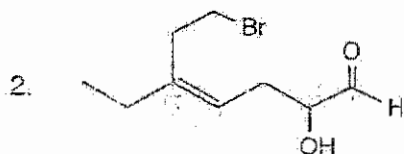
Key

A. Nomenclature: (15 points, 5 points each)

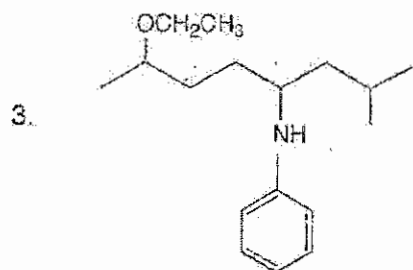
Please provide an acceptable name for each of the following compounds. Be sure to note stereochemistry where appropriate.



(S)-(4-oxopentyl)-3-methylaminobutanoate



(4Z)-7-bromo-5-ethyl-2-hydroxyhept-4-enal

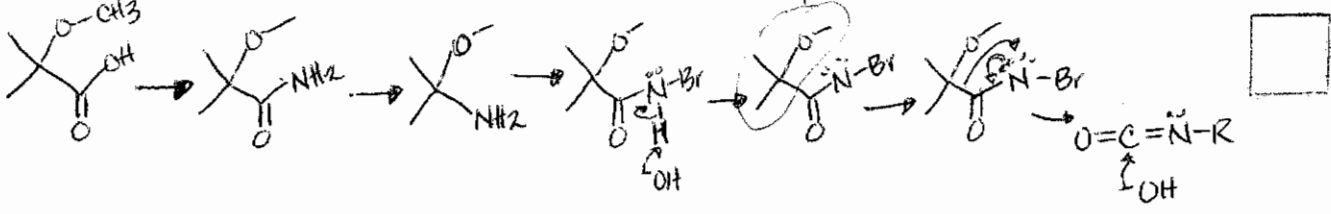
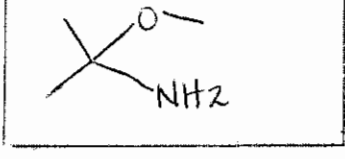
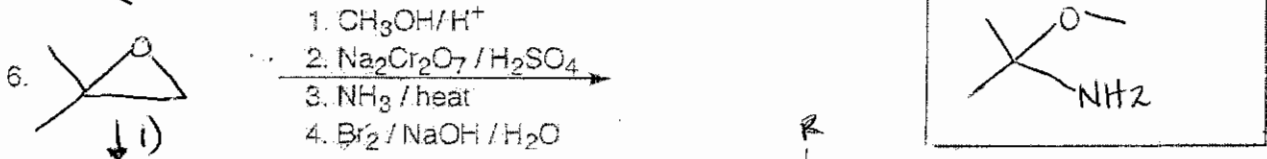
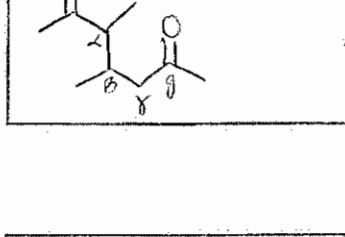
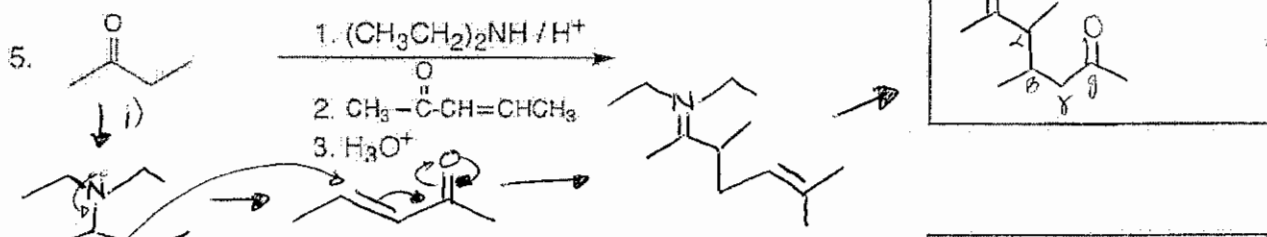
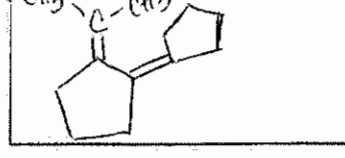
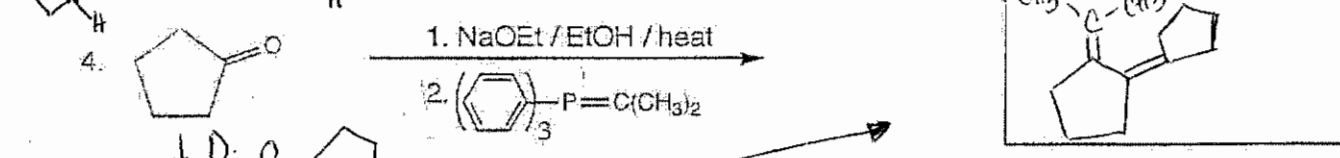
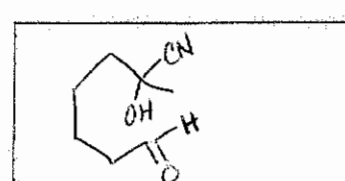
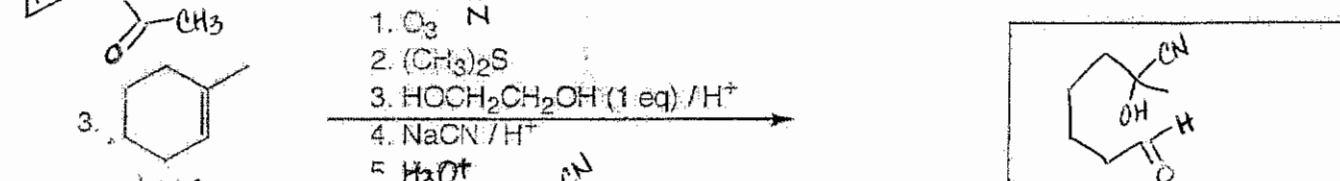
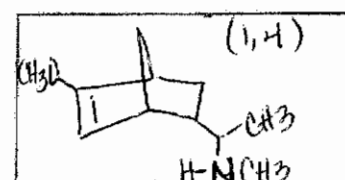
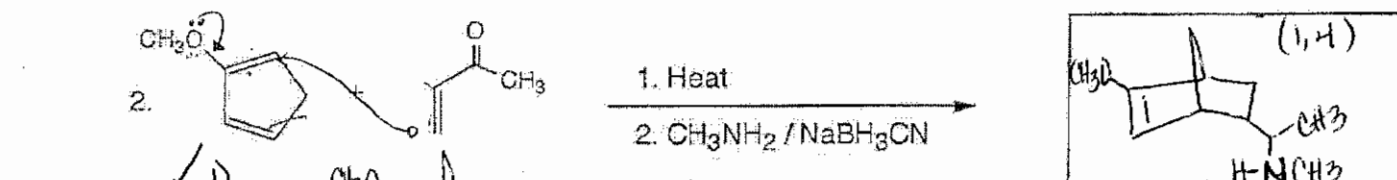
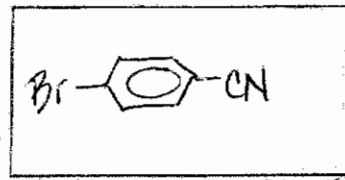
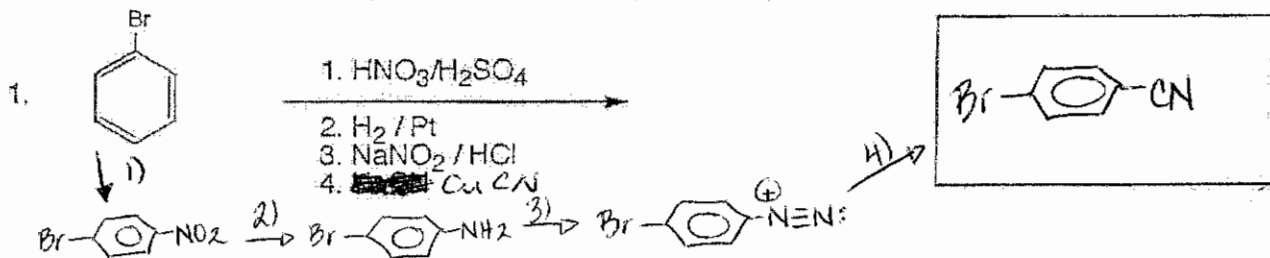


N-phenyl-7-ethoxy-2-methyl-4-octanamine



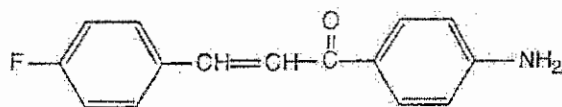
B. Reactions: Total = 40 points, 8 points each

Please provide the major product in the answer box for **FIVE** of the reactions. Write "omit" in the box of the reaction you choose to omit. Be sure your drawings indicate stereochemistry if applicable. Partial credit is awarded only when intermediate products are shown below the reaction.

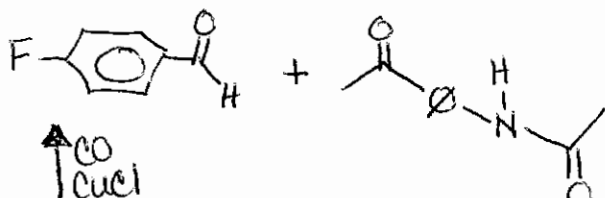


D. Synthesis: (15 points)

Synthesize the compound below using any of the following reagents: benzene and alkanes, alkenes, alkynes or alcohols of **three carbons or less**, any oxidizing or reducing agents, any peroxyacids, and any inorganic reagents. Please note: A starting material may not contain more than one functional group!



↑ then heat
-C₆H₅ / Δ



↑ CO
CuCl
AlCl₃
HCl



↑ HBF₄



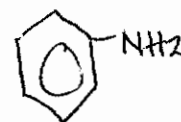
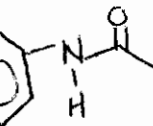
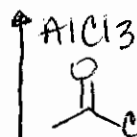
↑ NaNO₂/HCl



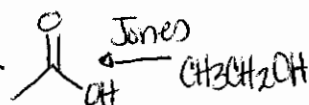
↑ Pt/H₂



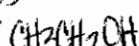
↑ HNO₃
H₂SO₄



← already synthesized



↑ Jones

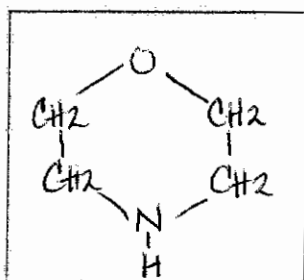


← SOCl₂

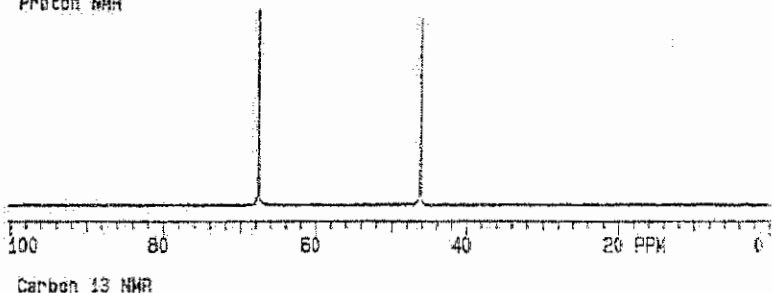
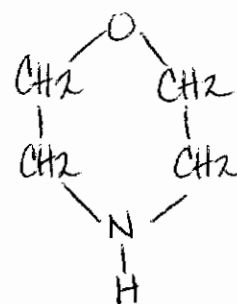
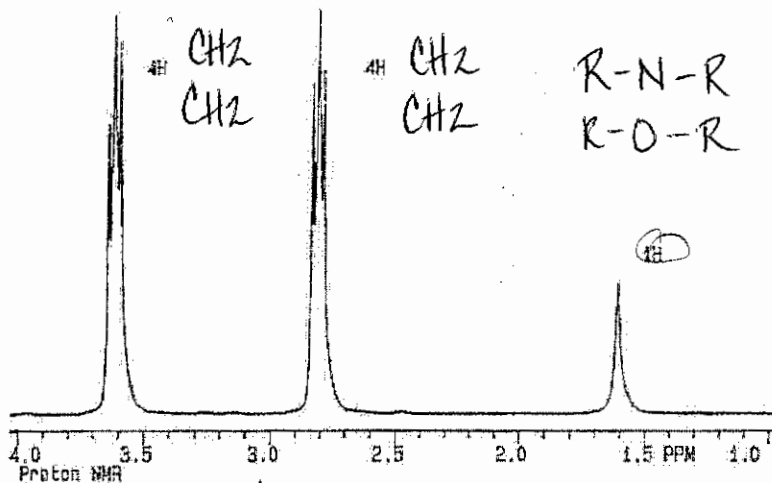
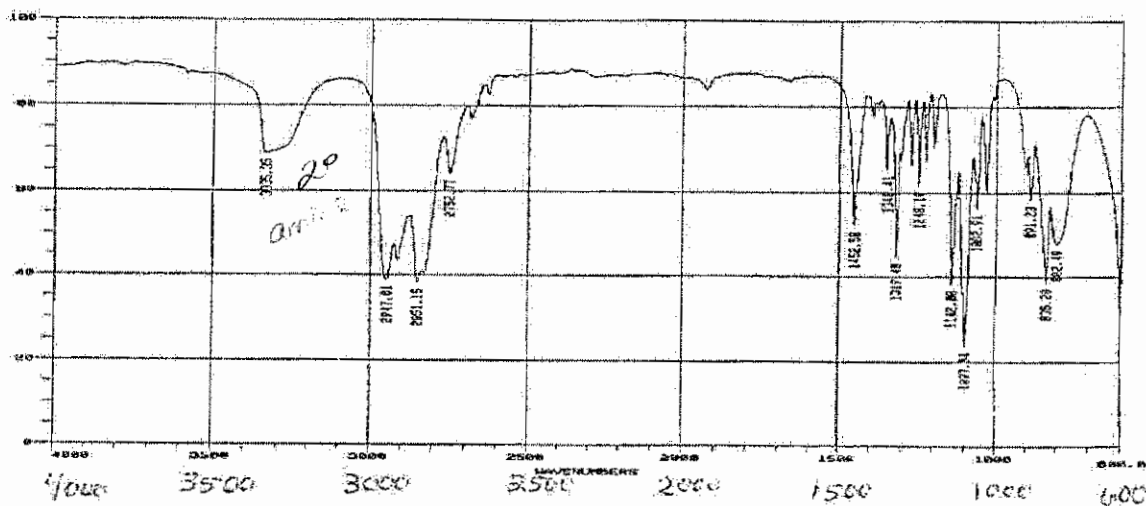
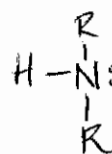


E Spectroscopy: 15 Points

A compound with the formula C_4H_9NO exhibits the IR, 1H NMR, and proton-decoupled ^{13}C NMR shown on the following page. Please identify this compound and draw the structure in the box provided below.



UN# = 7



57



Bonus Question: 10 points

Below are the IR, ^1H NMR, and proton-decoupled ^{13}C NMR spectra of a compound of unknown formula. The singlet at 1.3 ppm in the ^1H NMR spectrum is D_2O exchangeable. Propose a structure for this compound. Only answers in the box will be graded.

