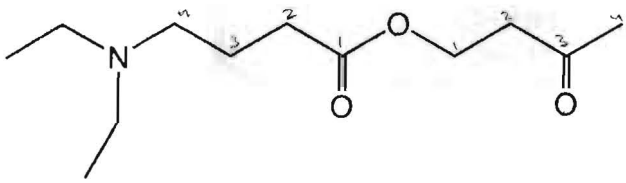
nenclature: (15 points)
an acceptable IUPAC name for each of the following compounds. Be sure to indicate the **ereochemistry** where appropriate.

1.



Stereo: None

Parent: 4-diethylaminobutanoate

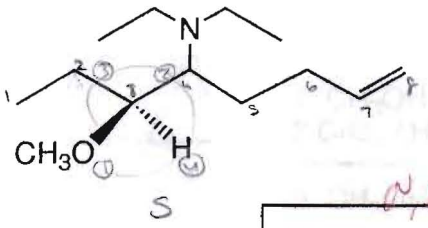
Subs: 3-oxobutyl

3-oxobutyl N,N-diethyl-4-amino butanoate

3-oxobutyl 4-diethylaminobutanoate

5/8

2.



Parent: 4-diethyloct-7-enamine

Stereo: 3S

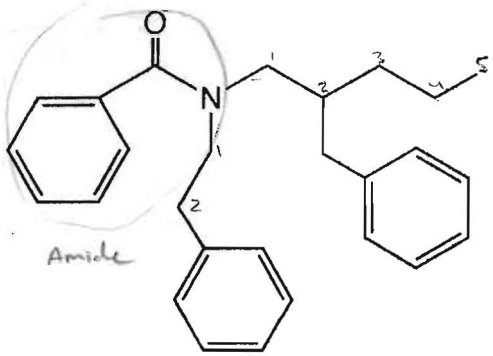
Subs: 3-methoxy

N,N-diethyl

(3S)-3-methoxy-4-~~diethyl~~ oct-7-enamine

4/8

3.



Parent: benzamide

Stereo: None

Subs: N-(2-benzylpentyl)
N-(2-phenylethyl)

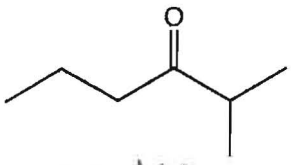
N-(2-benzylpentyl)-N-(2-phenylethyl)-benzamide

5/5

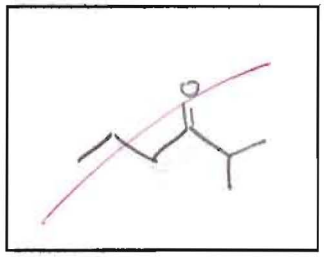
14

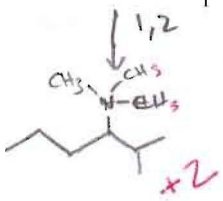
eactions: Total = 40 points, 8 points each
ease provide the reagents or major product in the answer box. Be sure your drawing indicates **stereochemistry** if applicable. Partial credit is awarded only when intermediate products in a multi-step reaction are shown below the reaction.

1.

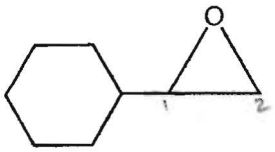


1. CH_3NH_2 / $NaBH_3CN$, then H_3O^+
2. CH_3I (xs)
3. Ag_2O / H_2O / Heat

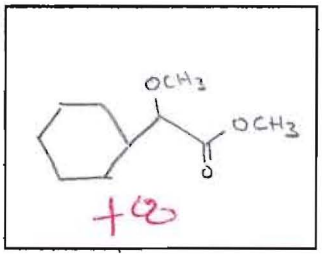


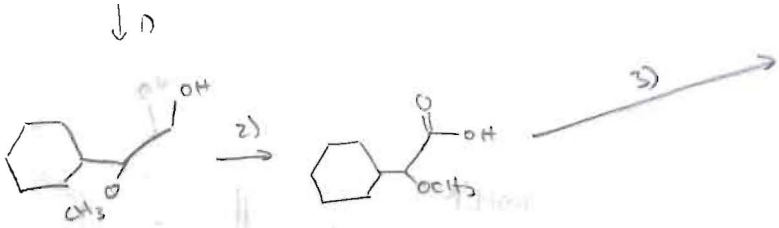


2.

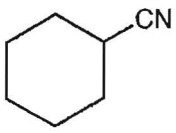


1. CH_3OH / H^+
2. CrO_3 / H_2SO_4 / H_2O /acetone/ 0°C
3. CH_3OH / H^+

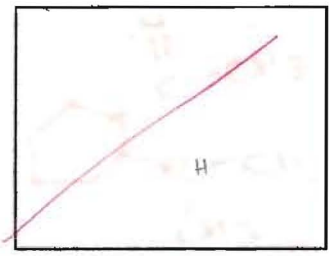


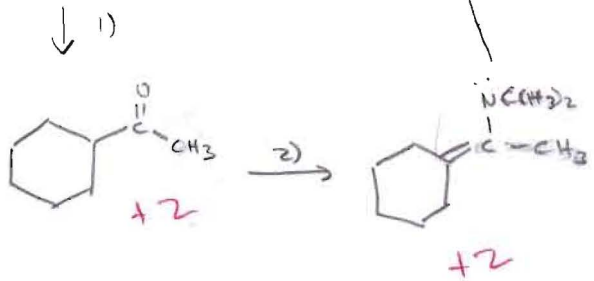


3.



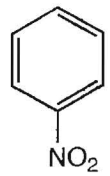
1. CH_3MgBr, then H_3O^+
2. $(CH_3)_2NH$ / H^+
3. $CH_3-CH=CH-CO_2CH_3$
4. H_3O^+ / Heat



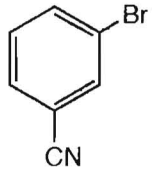


14

4.

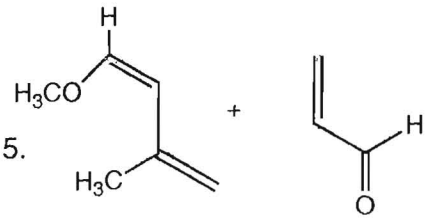


1) $FeBr_3$, Br_2
2) Zn / HCl
3) $NaNO_2$ / HCl
4) CuCN



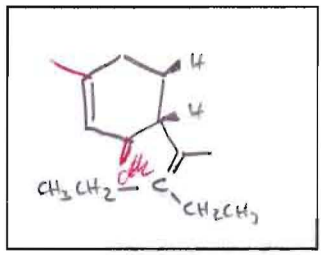
8

5.

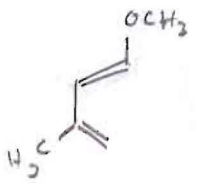


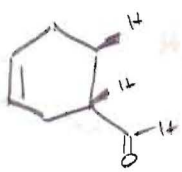
1.Heat

2. $\left(\text{C}_6\text{H}_5\right)_3\text{P}{=}\text{C}(\text{CH}_2\text{CH}_3)_2$



4

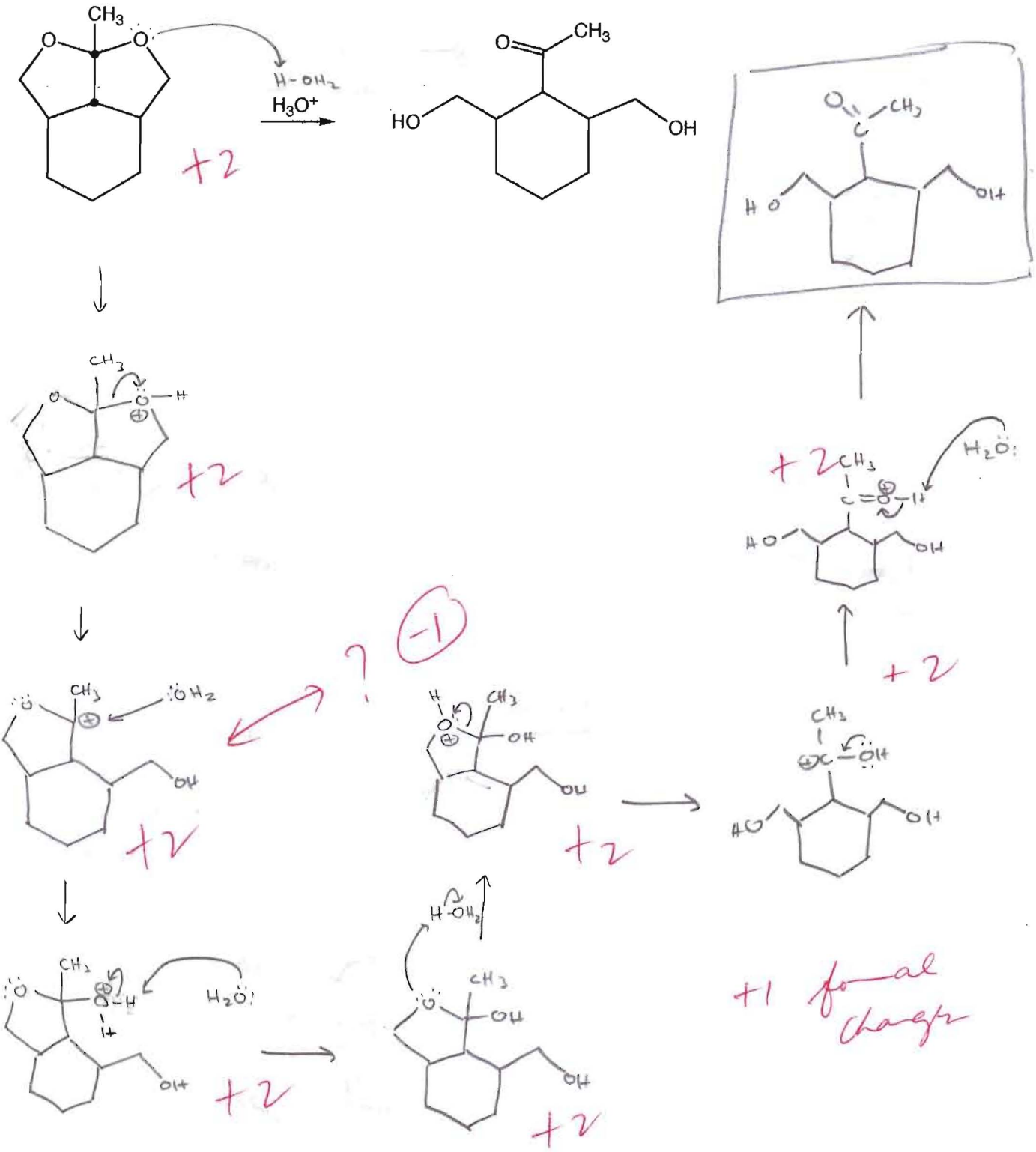




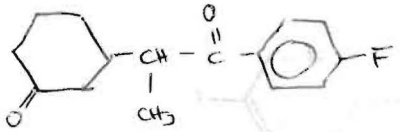
12

echanism: (15 points)

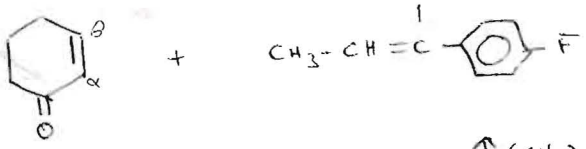
ovide a clear mechanism to explain the formation of the product. Use curved arrows to indicate "electron low". Remember to show only one step at a time. **Show all intermediates and all formal charges. When more than one resonance contributor may be drawn, be sure to draw the most stable contributor.**



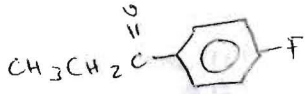
14



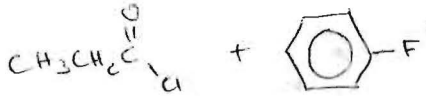
↑ then H_3O^+



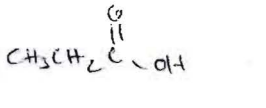
↑ $(CH_3)_2NH$ / H^+

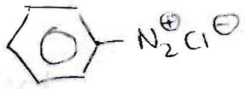


↑ $AlCl_3$

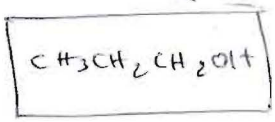


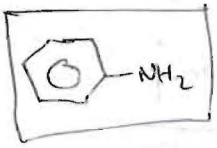
↑ $SOCl_2$ ~~$SOCl_2$~~ ↑ HBF_4 / Δ





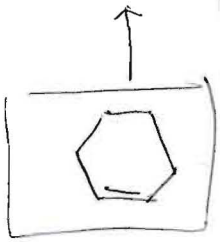
↑ Jones ox ↑ $NaNO_2$ HCl

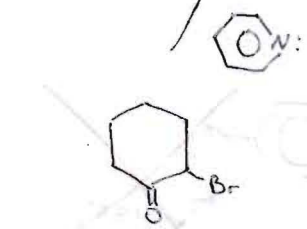




↑ Br_2 / CH_3CO_2H

↑ Jones





pectroscopy: 15 Points

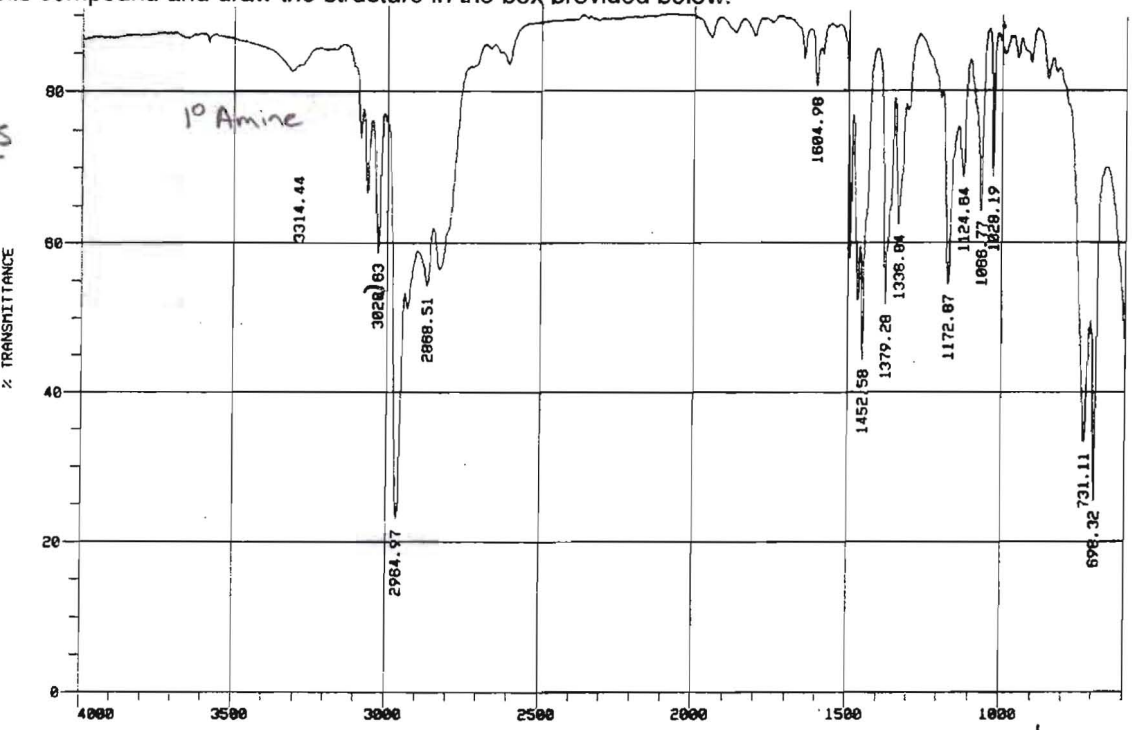
compound with the formula $C_{10}H_{15}N$ exhibits the IR, ^1H NMR and proton decoupled ^{13}C NMR spectra shown below. Please identify this compound and draw the structure in the box provided below.

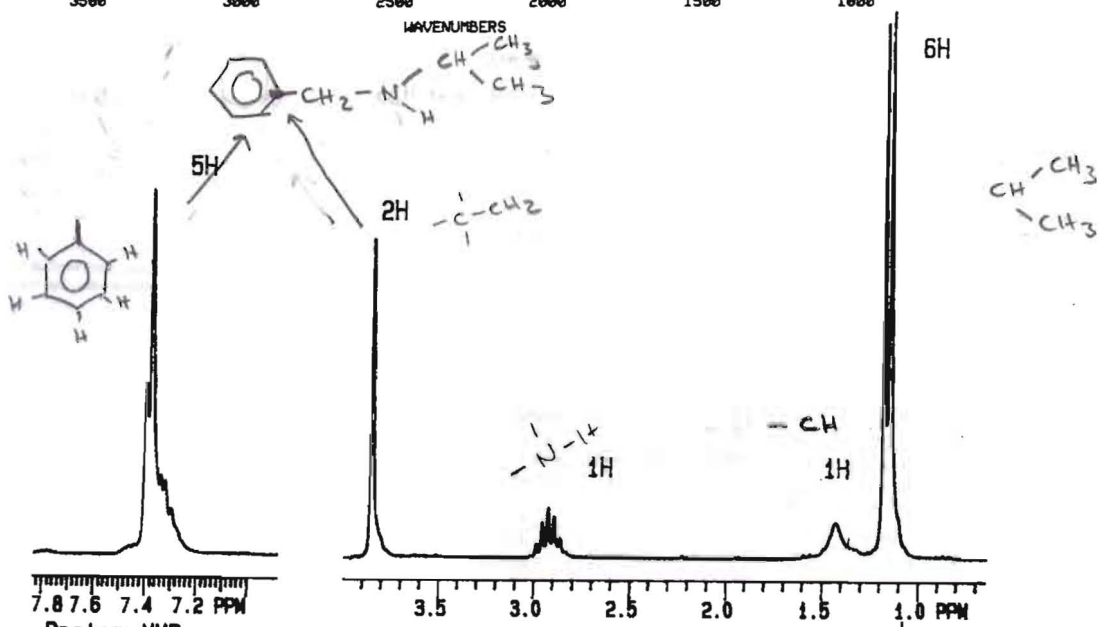
$$\frac{(10.5\times2)+2-15}{2}$$

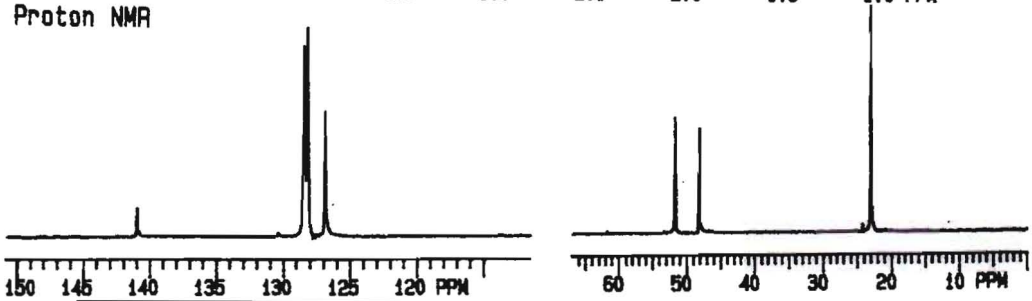
$$\frac{21+2-15}{2}$$

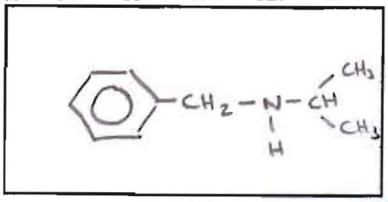
$$\frac{23-15}{2}$$

$$\text{IN} = \frac{8}{2} = 4$$









15