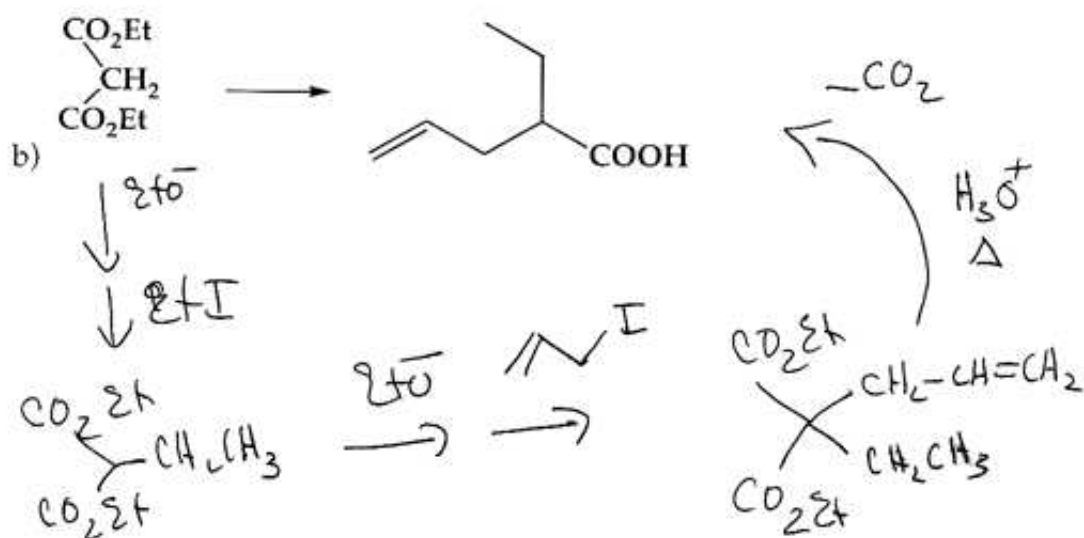
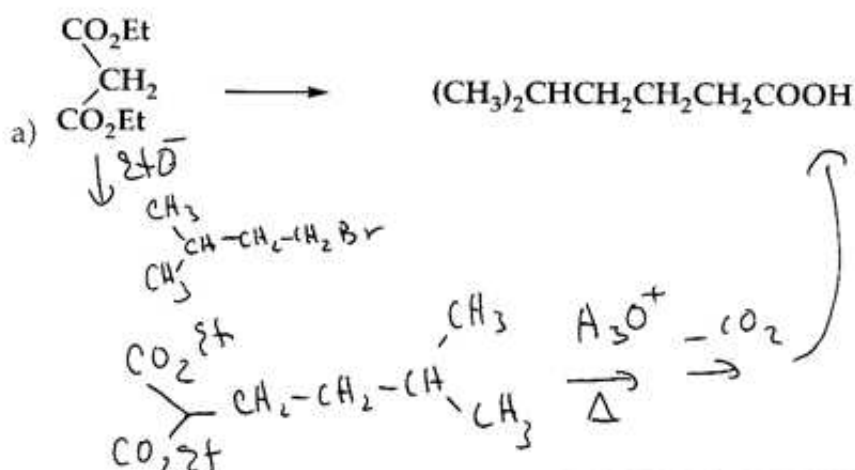


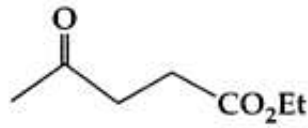
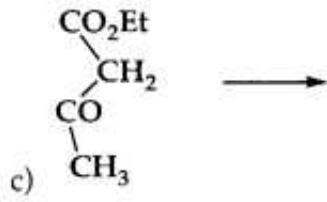
## Chemistry 3371-100

Organic Chemistry/Dr. Barney Ellison

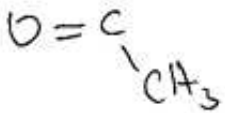
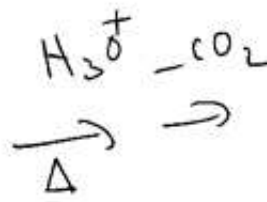
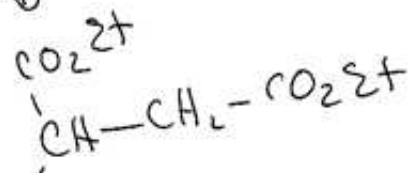
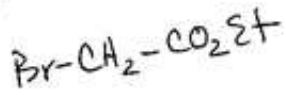
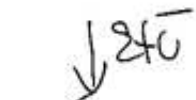
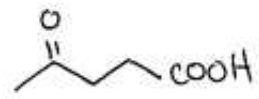
Thursday: April 15<sup>th</sup> @ 7:00pm → 9:00/3<sup>rd</sup> Exam/Hellems 201Name: Key (please print)

1. (15 pts) Use either the malonic ester synthesis or acetoacetic ester synthesis to prepare the following

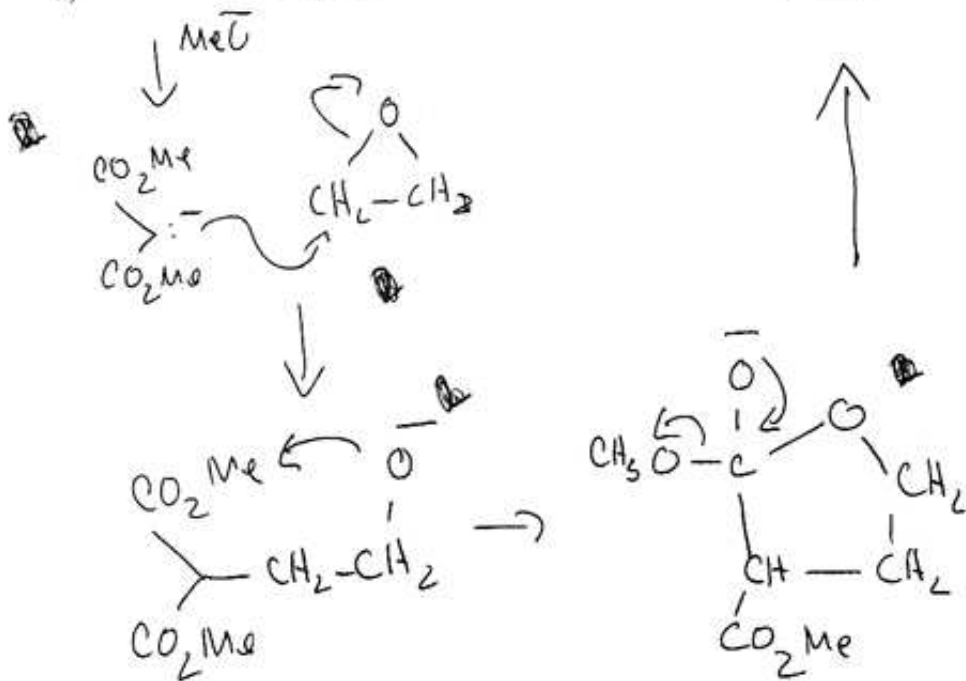
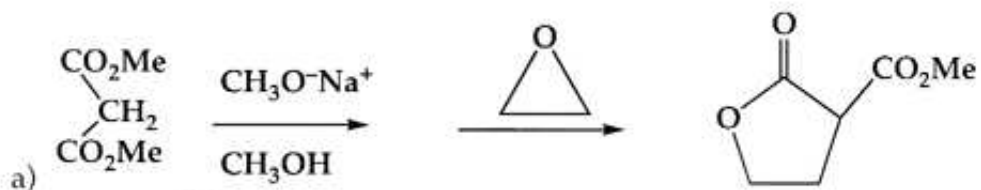


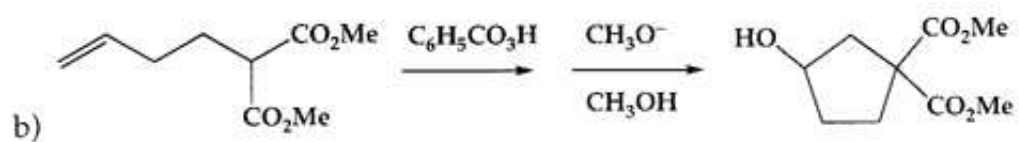


or likely

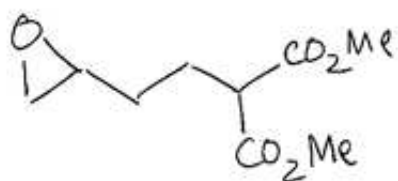


2. (10 pts) Propose a mechanism for the following reactions.





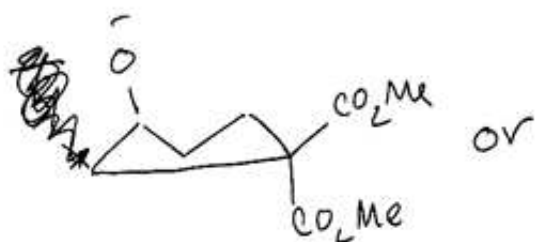
$\downarrow \text{PhCO}_3\text{A}$



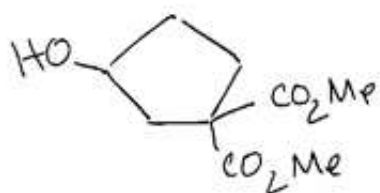
$\downarrow \text{MeO}^-$



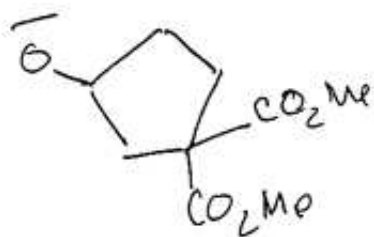
$\downarrow$



≡

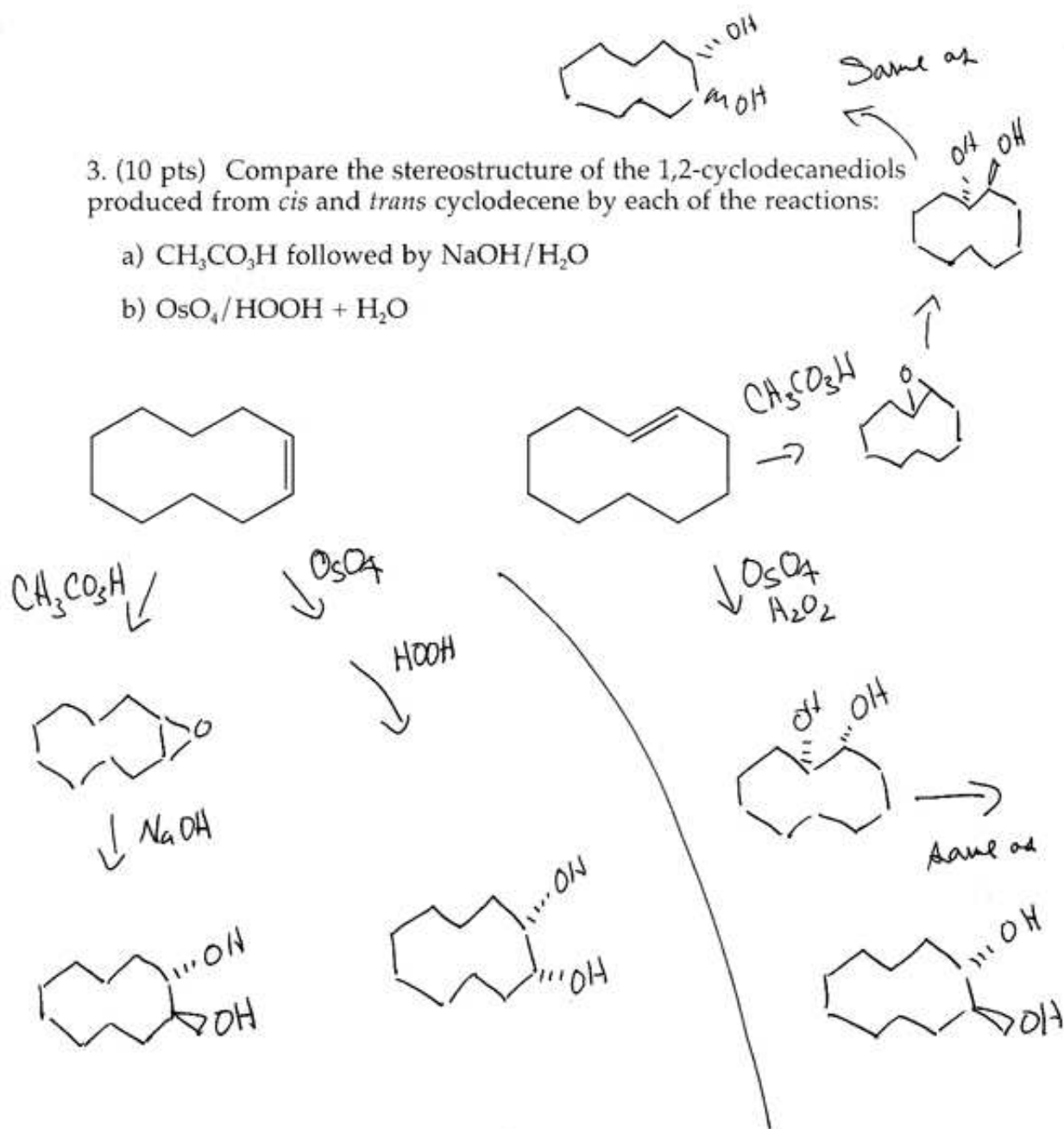


$\uparrow \text{MeOH}$

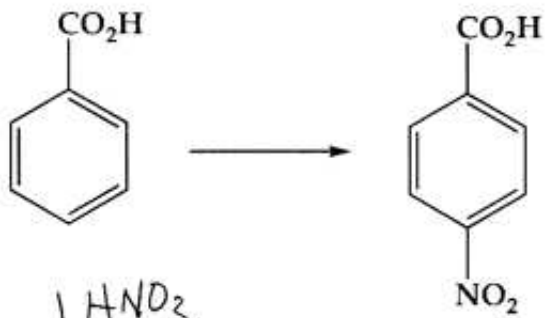


3. (10 pts) Compare the stereostructure of the 1,2-cyclodecanediols produced from *cis* and *trans* cyclodecene by each of the reactions:

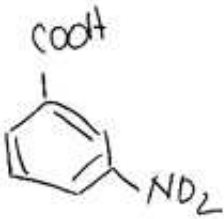
- $\text{CH}_3\text{CO}_3\text{H}$  followed by  $\text{NaOH}/\text{H}_2\text{O}$
- $\text{OsO}_4/\text{HOOH} + \text{H}_2\text{O}$



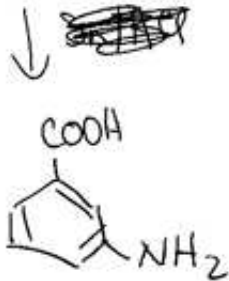
4. (10 pts) Carry out the following transformation.



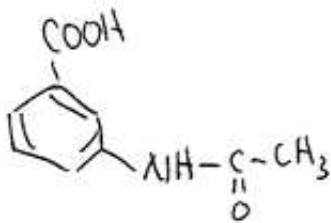
$\downarrow$   $\text{HNO}_3$



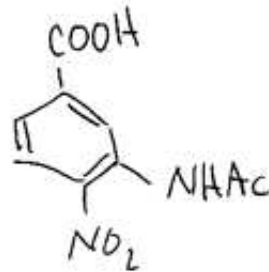
$\text{SnCl}_2$   
 $\text{HCl}$



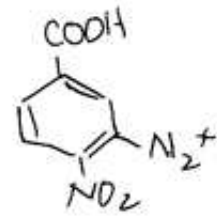
$\downarrow$   $\text{Ac}_2\text{O}$



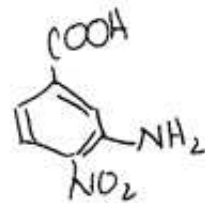
$\text{HNO}_3$



$\text{H}_3\text{PO}_2$

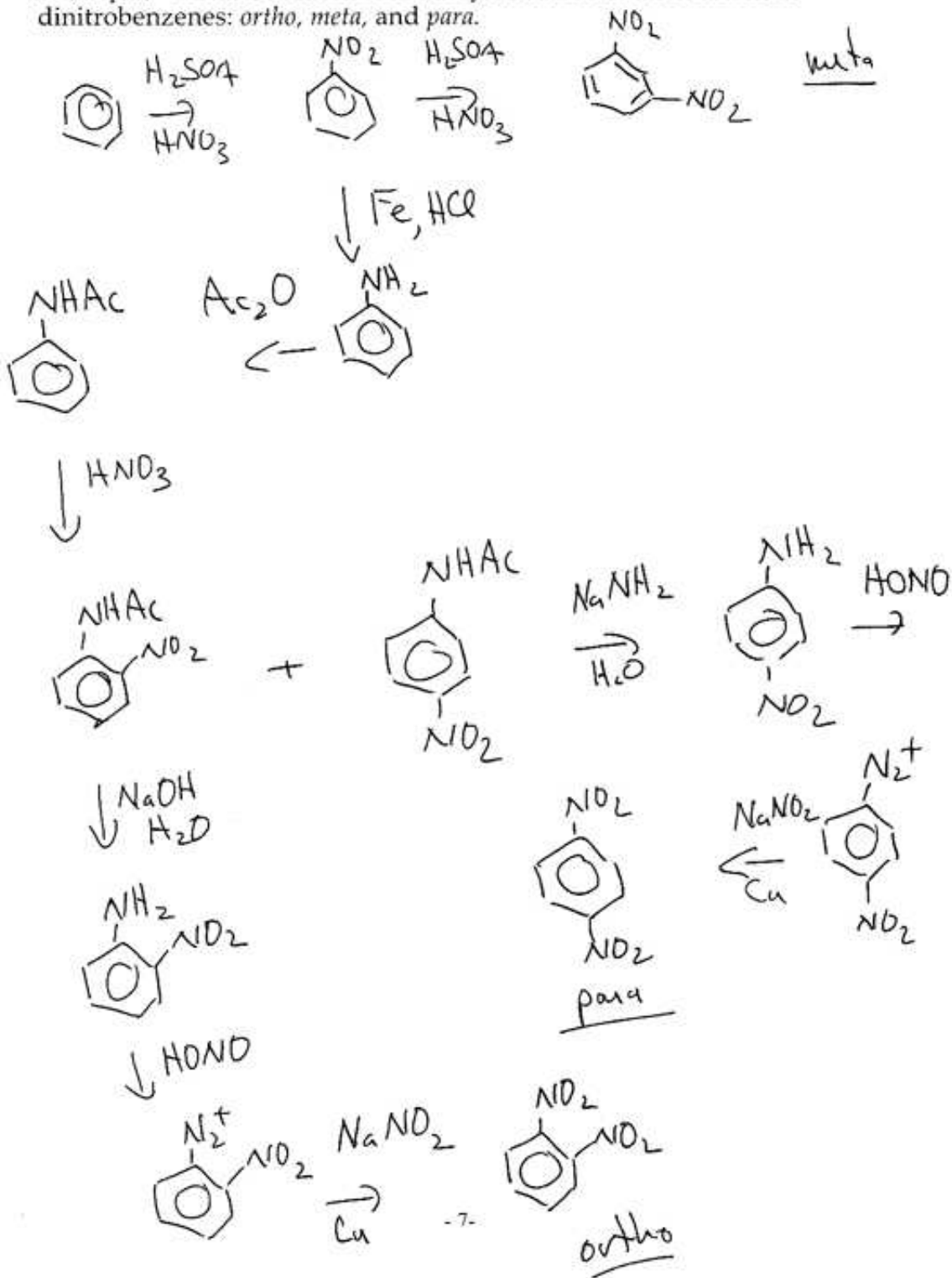


$\uparrow$   $\text{HONO}$

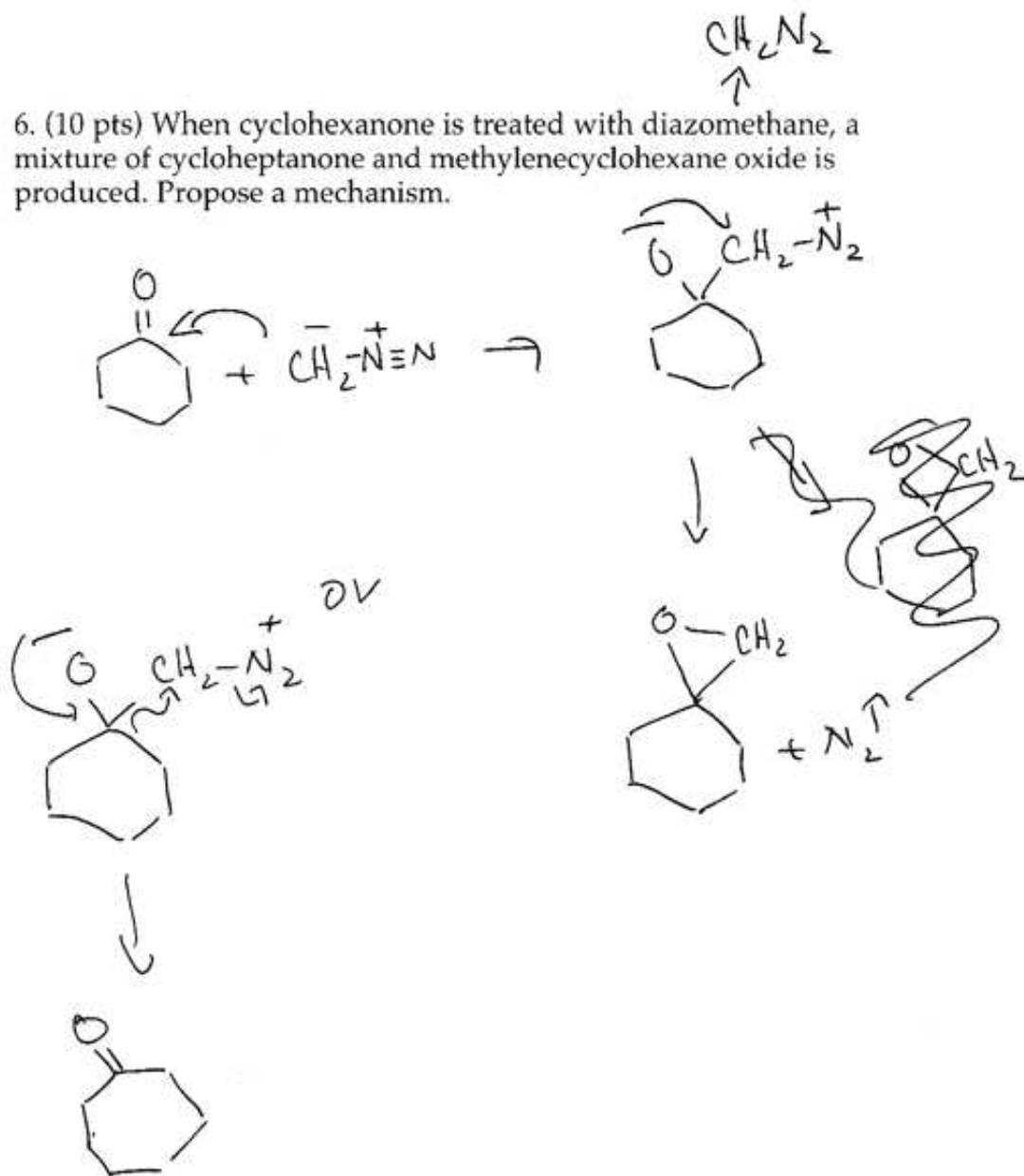


$\uparrow$   $\text{NaOH}$   
 $\text{H}_2\text{O}$

5. (15 pts) Outline methods for the synthesis of all three isomeric dinitrobenzenes: *ortho*, *meta*, and *para*.

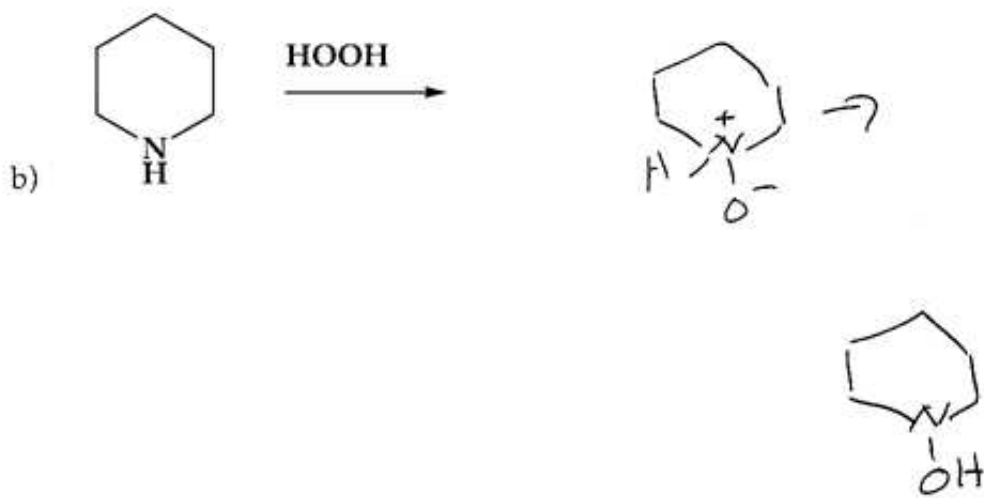
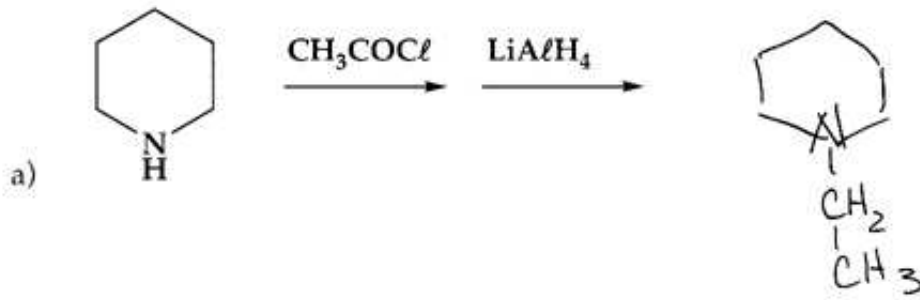


6. (10 pts) When cyclohexanone is treated with diazomethane, a mixture of cycloheptanone and methylenecyclohexane oxide is produced. Propose a mechanism.

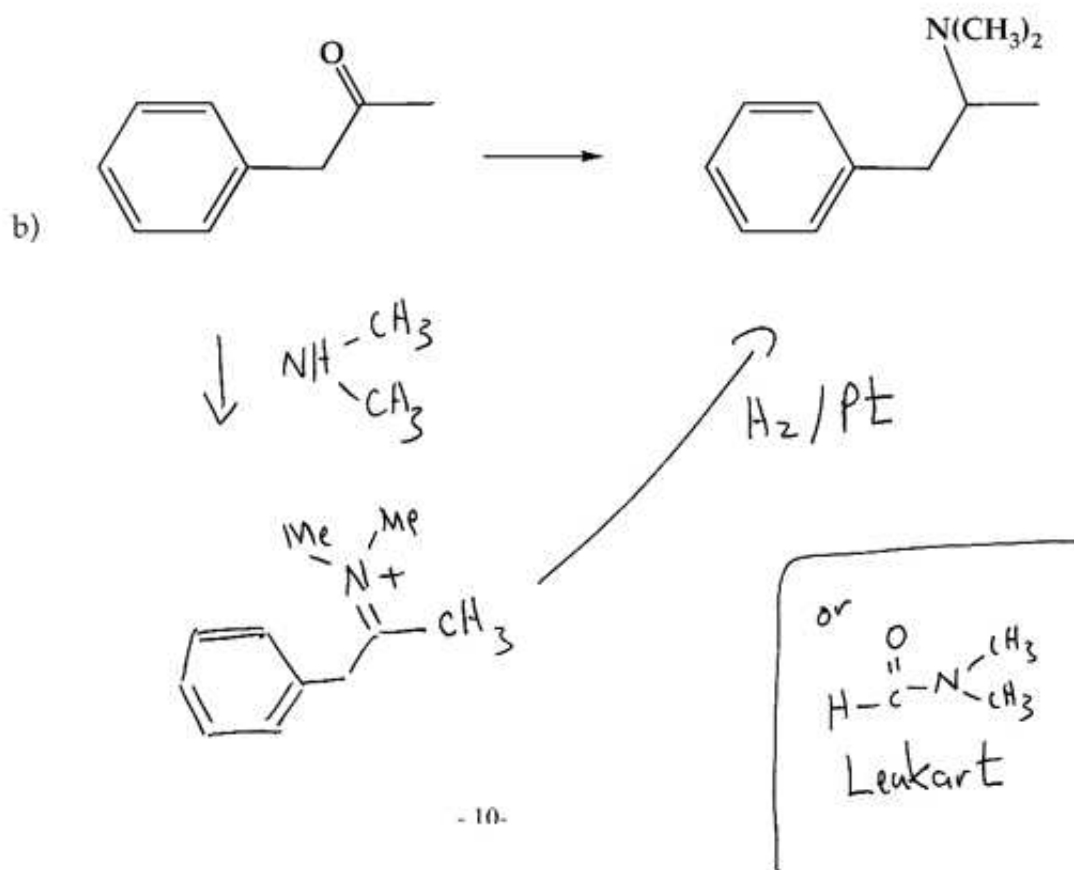
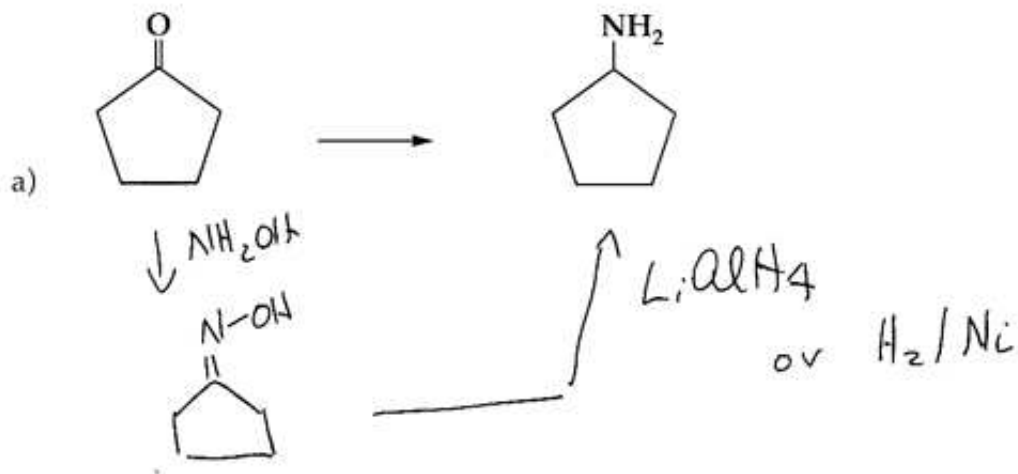




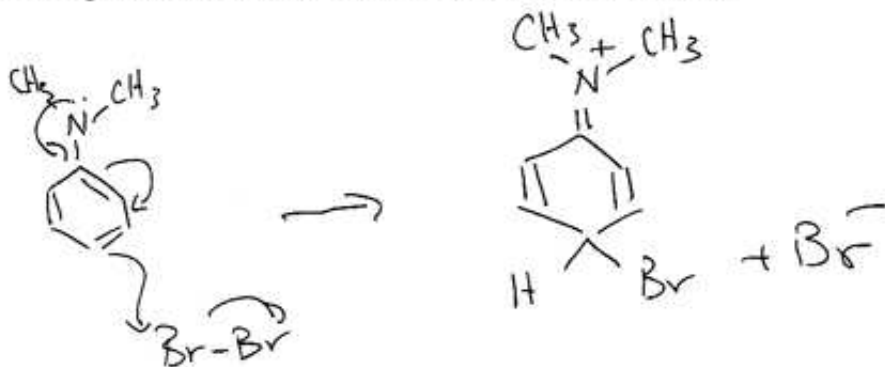
7. (10 pts) What is the product expected when piperidine is subjected to each of the following sets of reactions?



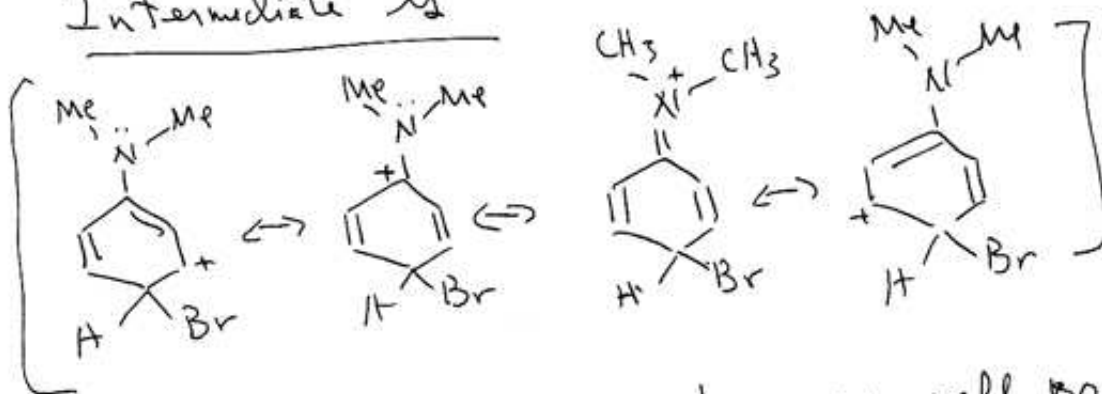
8. (10 pts) Show how to accomplish each of the following conversions.



9. (10pts) Write out the mechanism for bromination of N,N-dimethylaniline in the para position with Br<sub>2</sub> and show why this compound is so much more reactive than benzene.



Intermediate is



The  $\text{NMe}_2$  group stabilizes charge very well, so intermediate is more stable than benzene case.

