Name: GSI Key _____ SID: _____

Signature: _____

PRINT YOUR NAME CLEARLY!!

Chem 3B Su10 **Midterm 2** **02AUG10**
Neil O.L. Viernes

This exam has 11 pages; **make sure you have them all.** Page 11 is blank. Use as scratch paper, anything written on it will NOT be graded.

Please place answers in designated spaces. **Please write clearly.** Messy or ambiguous answers will not be graded.

This exam is 90 minutes long. No clarifying questions will be answered by the GSI's after the exam begins.

Mark one of the following. If you are enrolled in Chem 3BL, mark off your laboratory section.

___ Lecture Only

___ Completing I Grade
(Professor Name _____)

___ 101 – Michael Chiang

___ 102 – Amy McCarthy

___ 103 – Rob Padilla

___ 107 – Rob Padilla (Evening)

___ 108 – Kevin Zhao

___ 109 – Katherine He

___ 201 – David Nagle

___ 202 – Greg Dallinger

___ 203 – Reyu Sakakibara

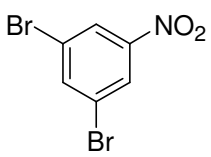
___ 204 – Susan Kim

___ 207 – Arash Nayeri

___ 208 – Philip Chung

Do not write in this box	
1) _____	**(12)**
2) _____	**(27)**
3) _____	**(16)**
4) _____	**(18)**
5) _____	**(20)**
6) _____	**(24)**
7) _____	**(16)**
8) _____	**(15)**
9) _____	**(12)**
Total: _____	**(160)**

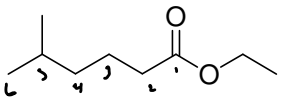
1) (12 pts)
Provide nomenclature or structures for the following:



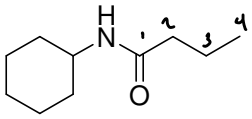
1,3-Dibromo-5-nitrobenzene

or

3,5-Dibromonitrobenzene

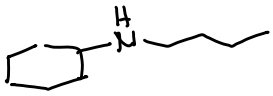


Ethyl-5-methylhexanoate

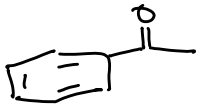


N-Cyclohexyl butanamide

N-Cyclohexylbutanamine

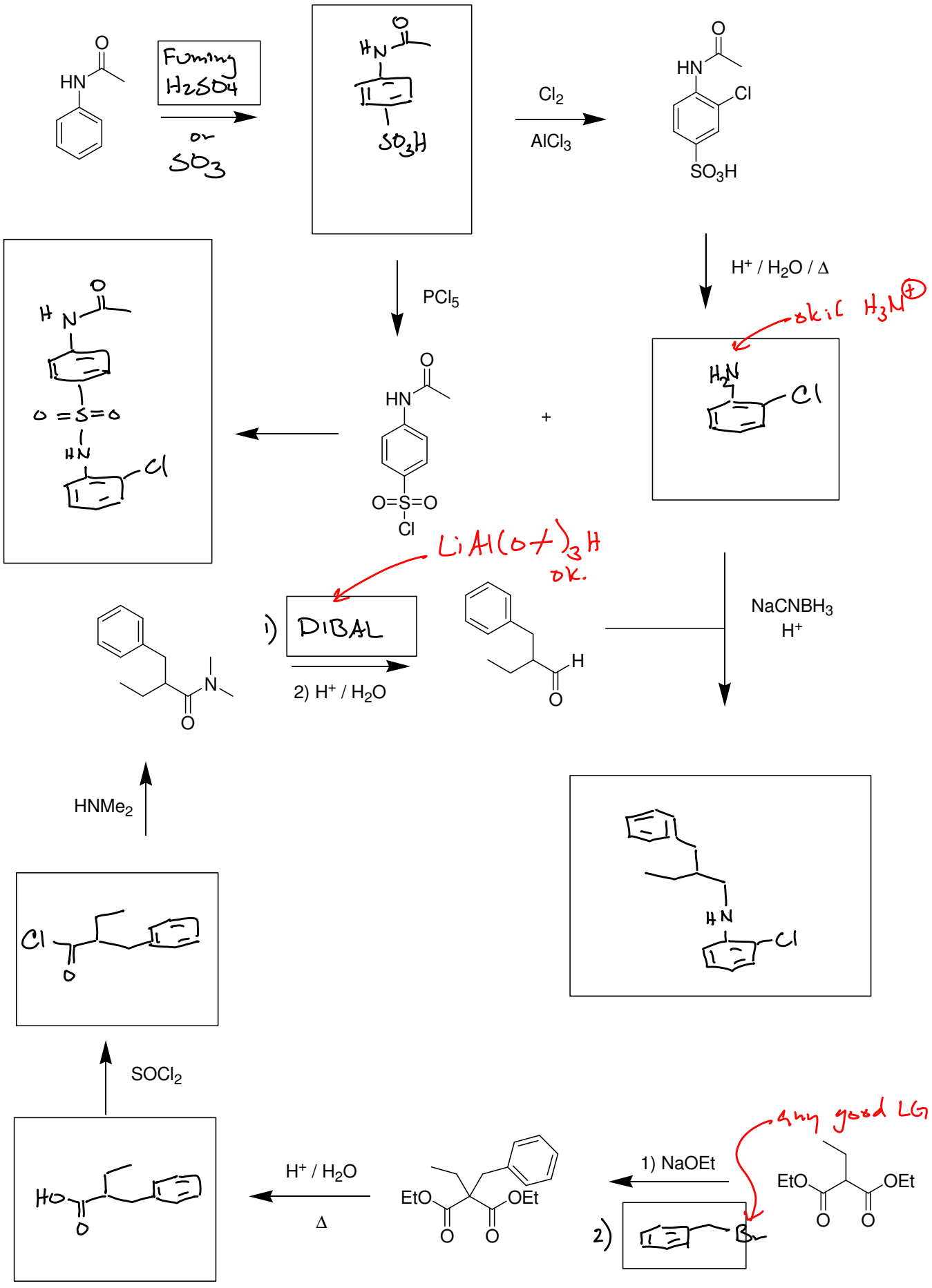


Acetophenone

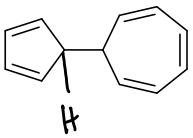


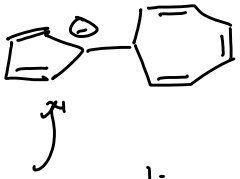
Propanoic Anhydride

2) (27 pts)
Complete the following roadmap. One compound or reaction step per box.

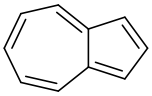


3) (16 pts)
Identify the most acidic hydrogen. Rationalize your answer.

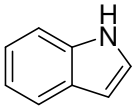




Determine if the following molecules are aromatic, anti-aromatic or non-aromatic. Assume that all of these compounds cannot bend out of planarity.

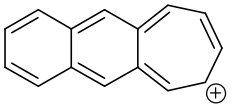


Aromatic



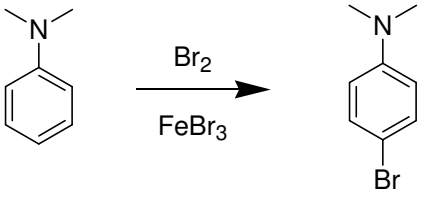
Aromatic

Anti-aromatic

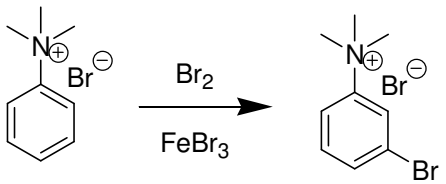


Aromatic

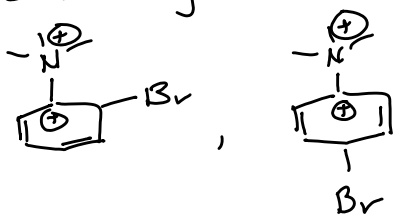
Draw intermediate structures to help rationalize the substitution patterns observed for the following reactions.



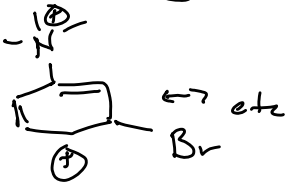
Additional resonance structure stabilizes the para-substituted intermediate



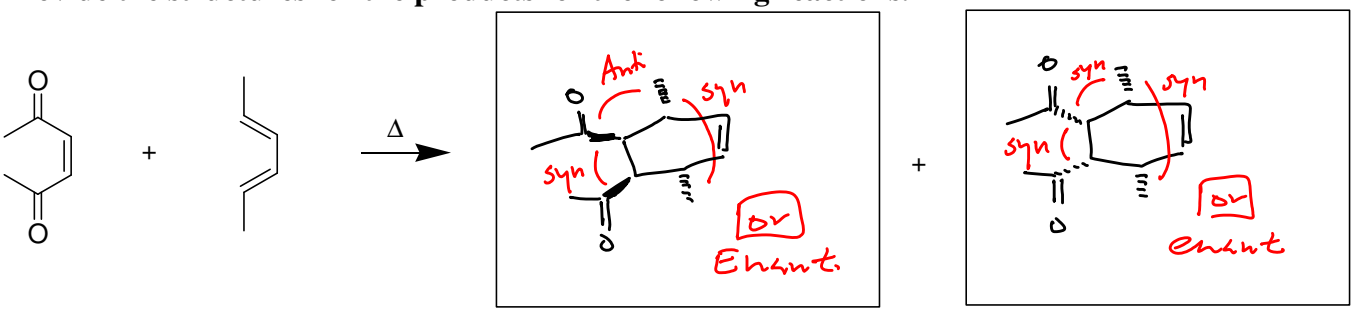
ortho/para subst. would generate a destabilizing resonance contributor



meta substitution does not have this destabilizing contributor

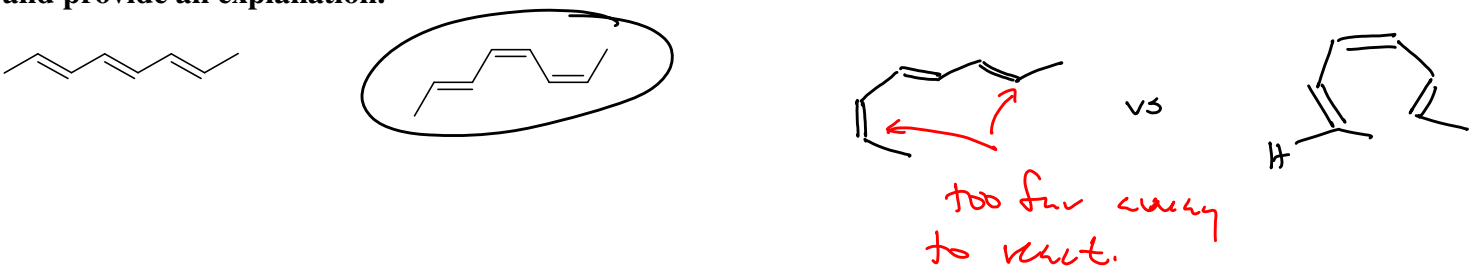


4) (18 pts)
Provide the structures for the products for the following reactions.

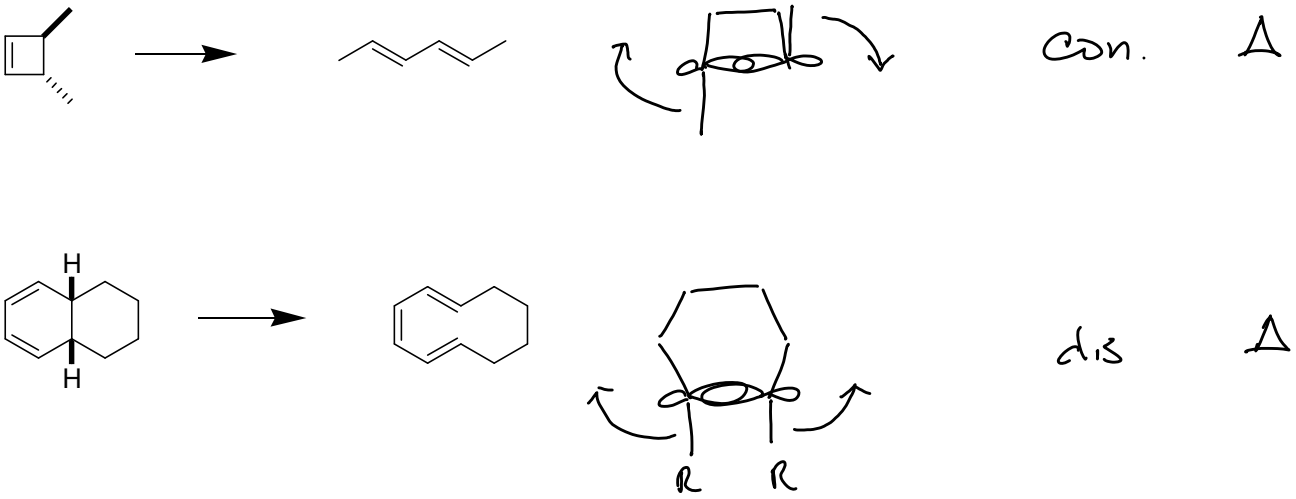


(Exo Product) **(Endo Product)**

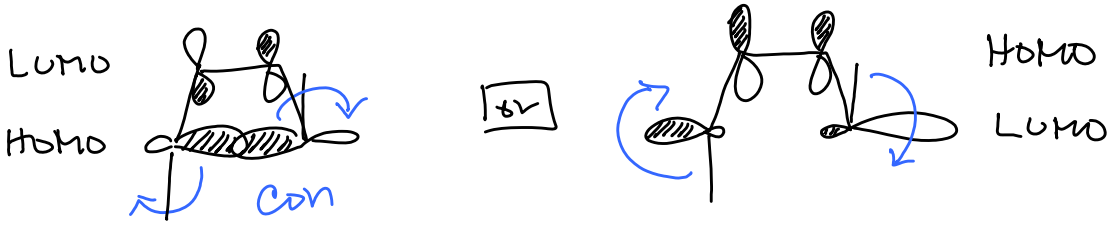
Only one of the following trienes will undergo electrocyclic ring closing reactions. Circle your answer and provide an explanation.



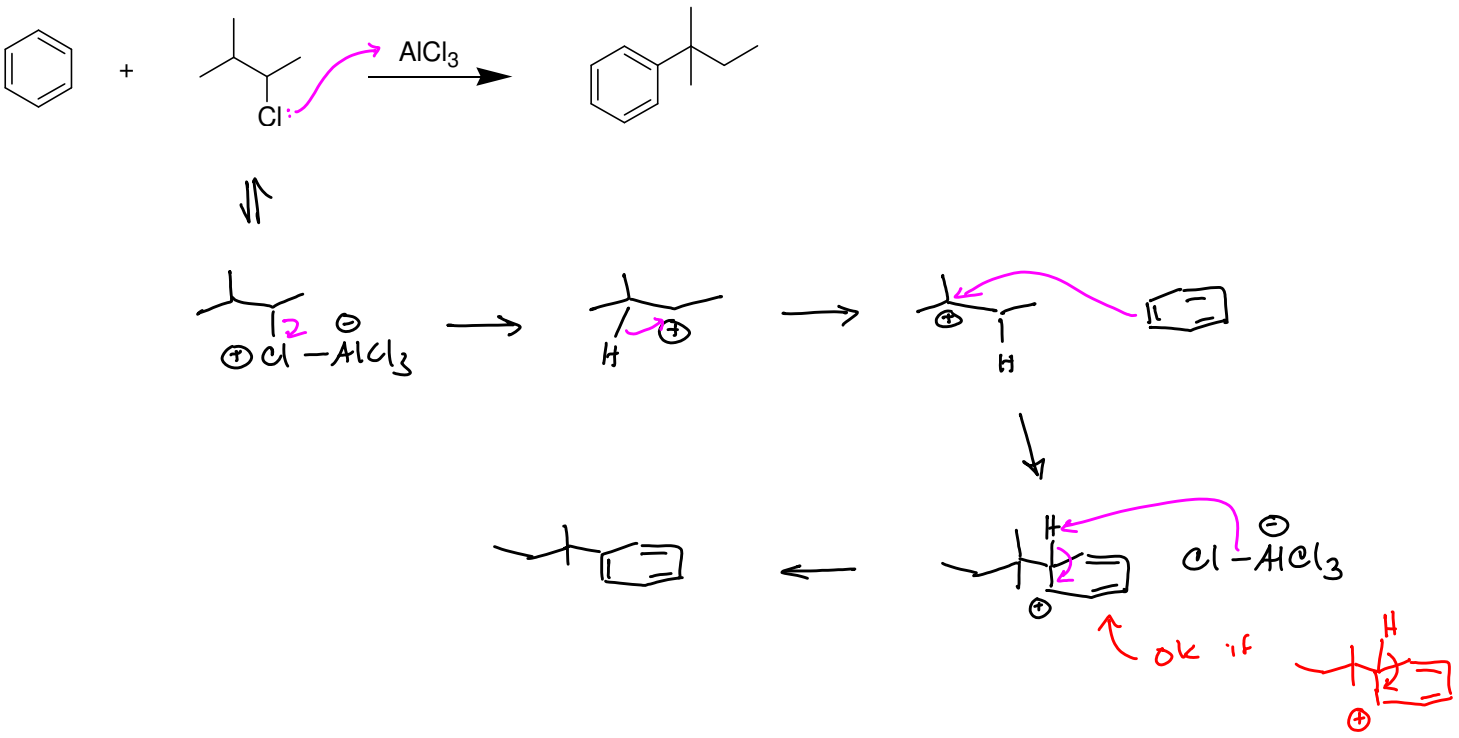
Determine if heat or light is used to obtain the products specified. Identify the direction of the rotation (conrotary or disrotary).



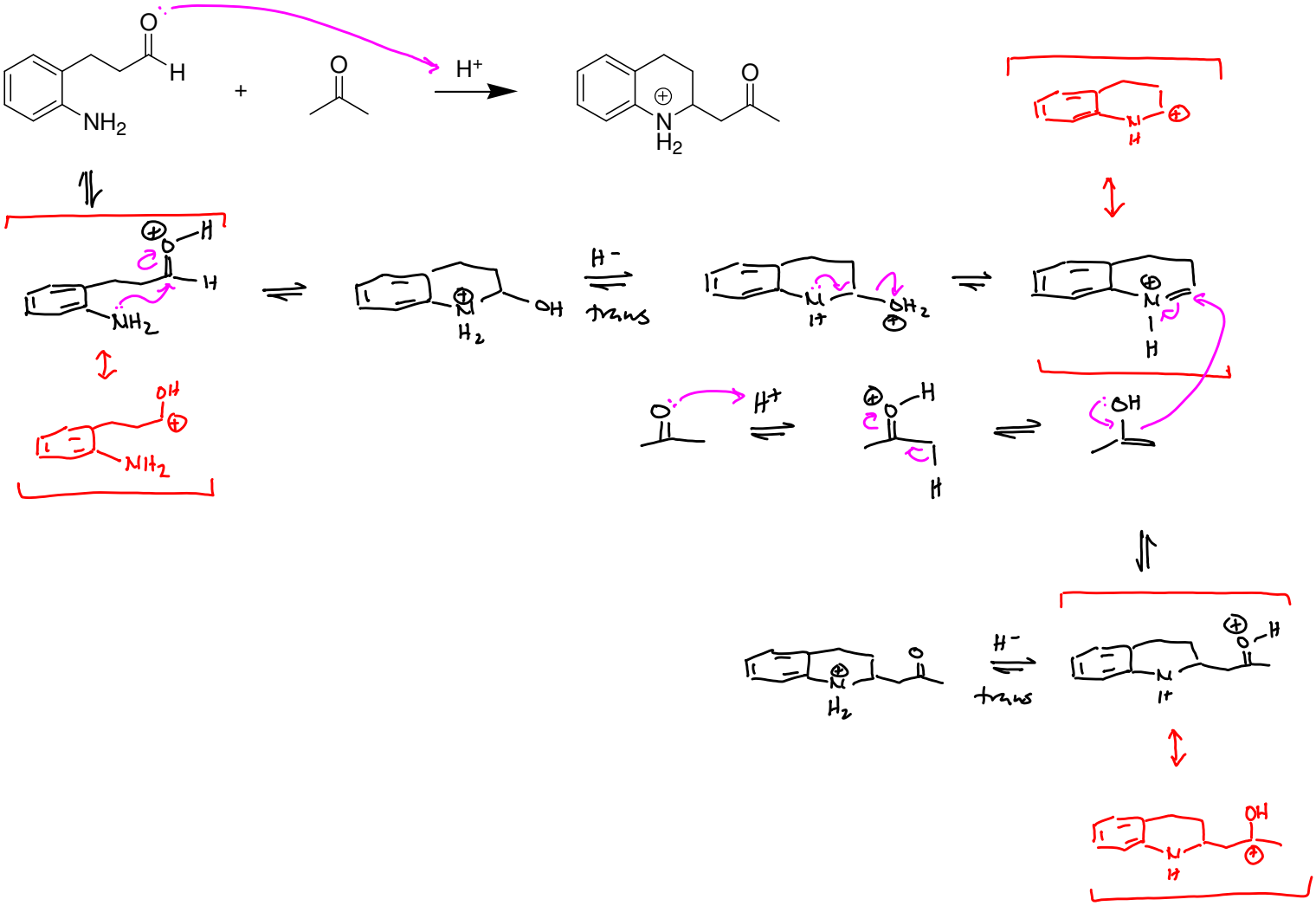
Draw molecular orbitals rationalizing your answer to the first electrocyclic ring opening reaction above.



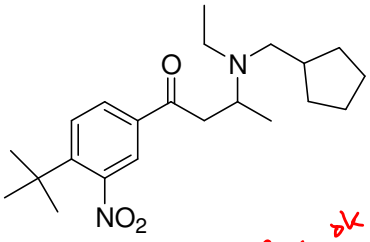
5) (20 pts)
Provide a mechanism for the following transformation.



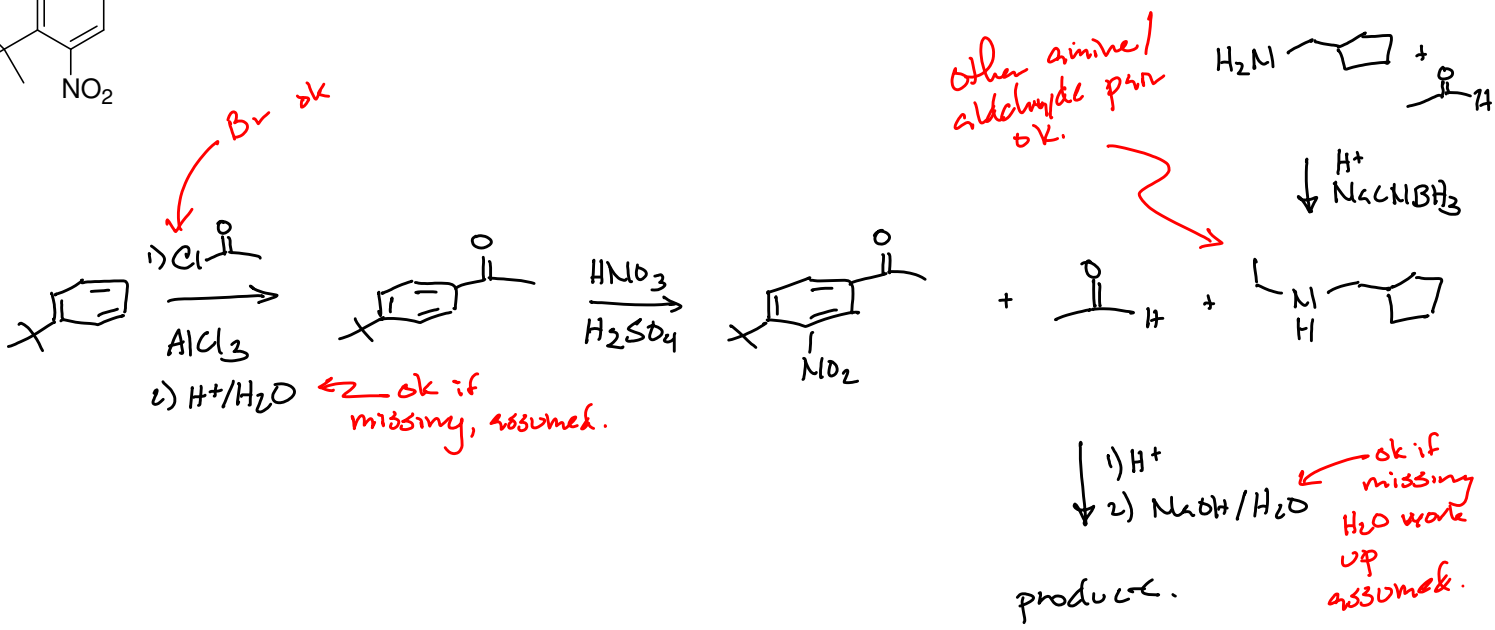
6) (24 pts)
Provide a mechanism for the following transformation.



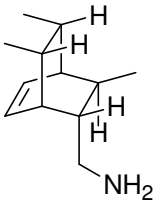
7) (16 pts)
Provide the best synthetic route to the following molecule.

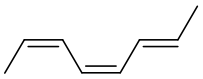


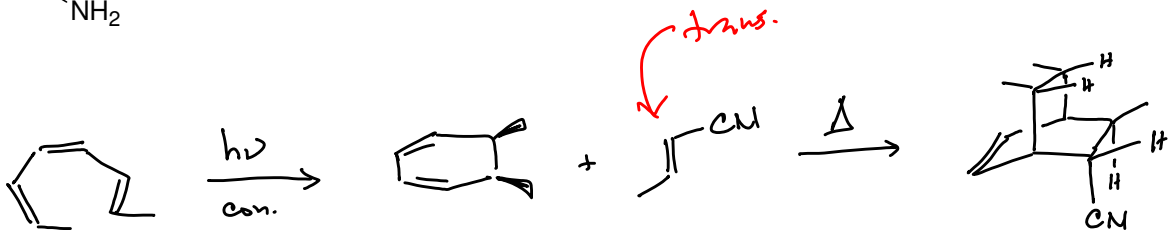
From any mono-substituted benzene and any starting materials 6 carbons or less



8) (15 pts)
Provide the best synthetic route to the following molecule.



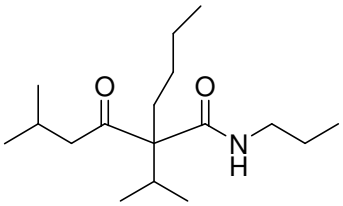
From  and $H_3CC{=}CCN$ (identify if the alkene is cis or trans) and any starting materials 3 carbons or less

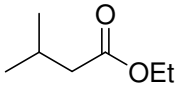


1) $LiAlH_4$
2) H^+/H_2O
product

ok if missing, assumed.

9) (12 pts)
Provide the best synthetic route to the following molecule.



From  and any starting materials
4 carbons or less