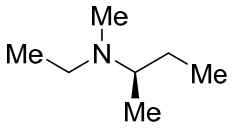
Chem 221 Exam 3 Green

Name:_____

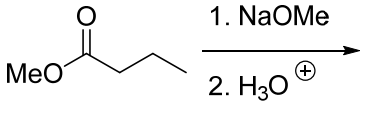
1. Circle the correct IUPAC name for the following molecule. (2 points)

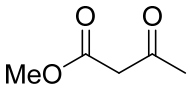


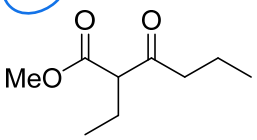
a. (S)-N-ethyl-N-methyl-2-butanamine **b.** (S)-N-ethyl-3-methylbutanamine

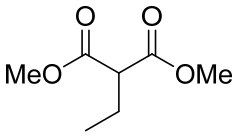
c. (R)-N-ethyl-N-methyl-2-butanamine **d.** (R)-1-ethyl-2-methylbutanamine

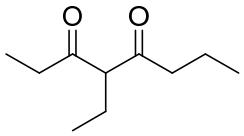
2. Circle the product for the following reaction. (2 points)



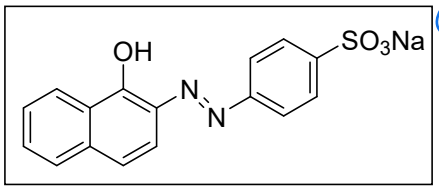
a. 

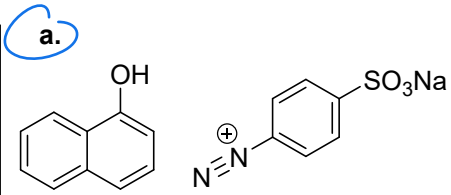
b. 

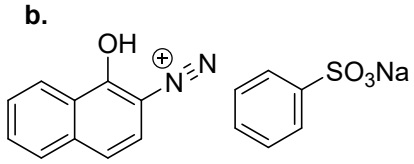
c. 

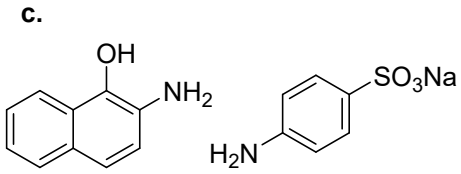
d. 

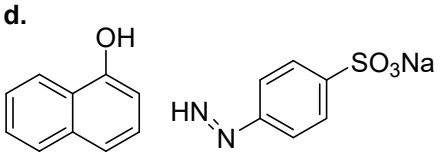
3. Identify the starting materials necessary to make the follow compound via an azo coupling reaction. (2 points)



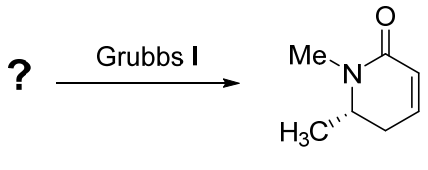
a. 

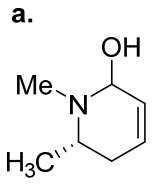
b. 

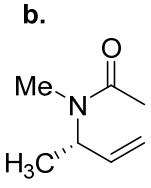
c. 

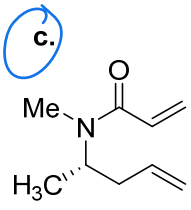
d. 

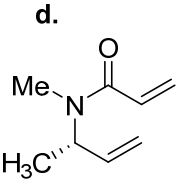
4. Circle the starting materials to make the following molecule via Ring Closing Metathesis. (2 points)



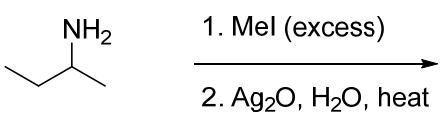
a. 

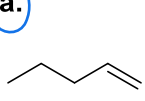
b. 

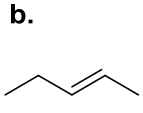
c. 

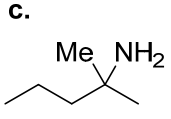
d. 

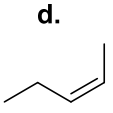
5. Circle the product for the following reaction. (2 points)



a. 

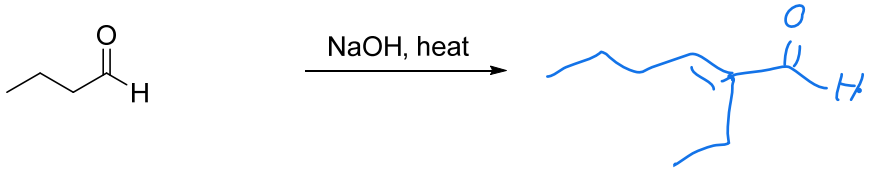
b. 

c. 

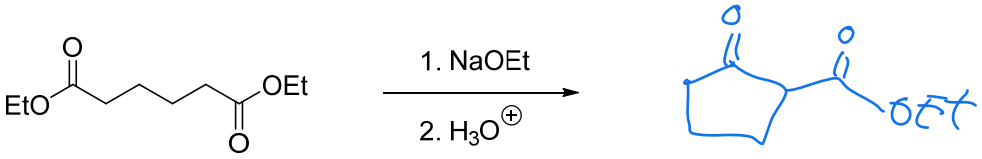
d. 

6. Provide the product for the following reactions. (12 points)

a.



b.



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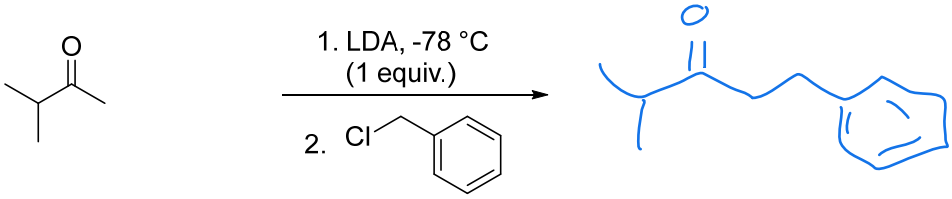
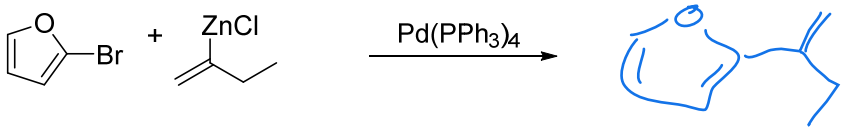
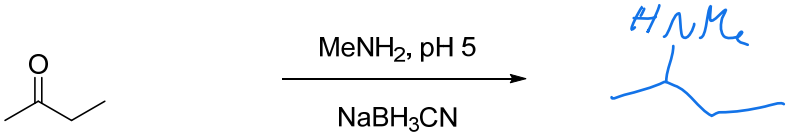


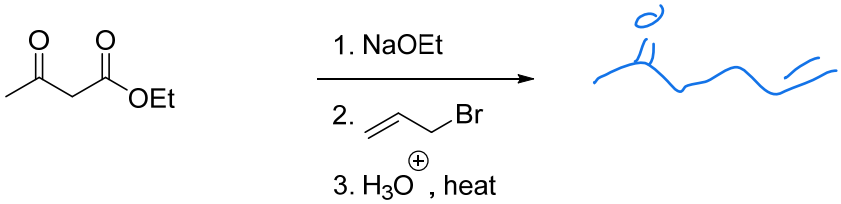
d.



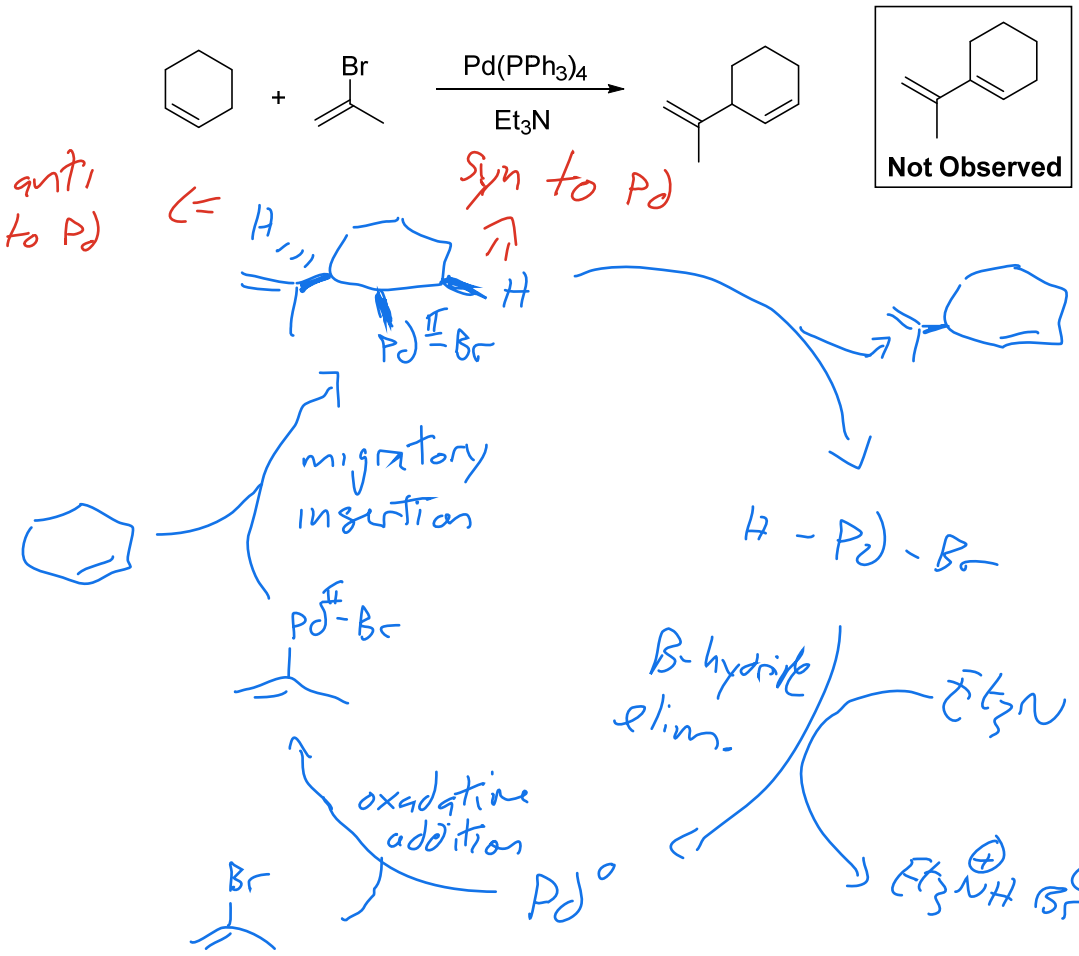
e.



f.

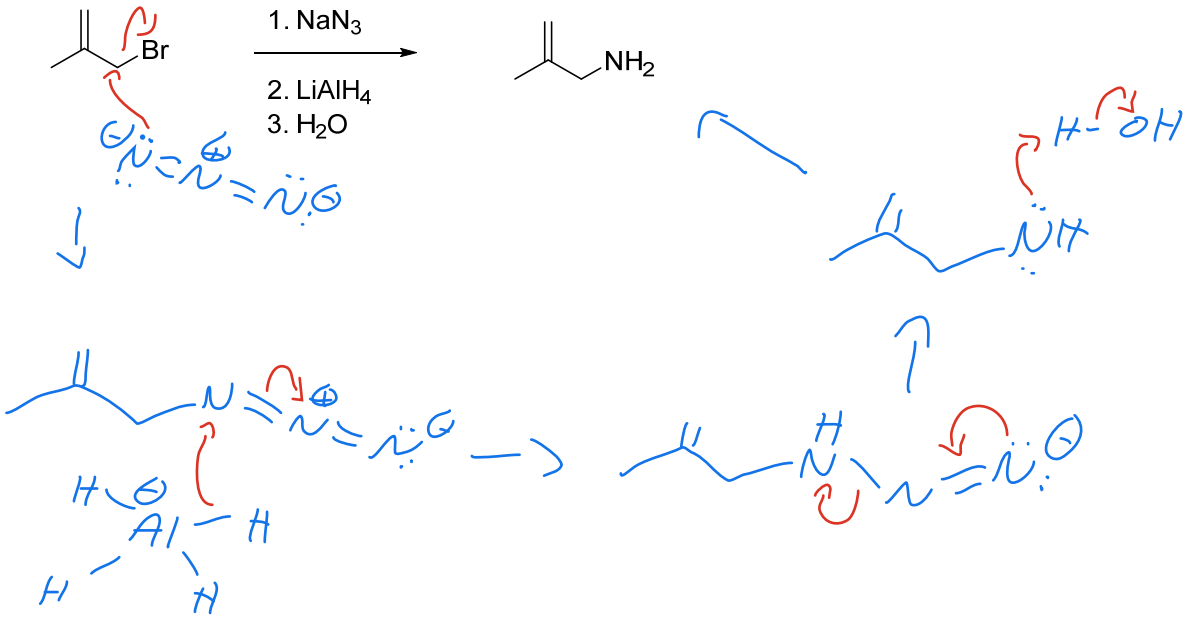


7. a. Provide a catalytic cycle for the following reaction.
   b. Label each step of the catalytic cycle.
   b. Use your catalytic cycle to help explain the observed regiochemical outcome of this reaction. (7 points)

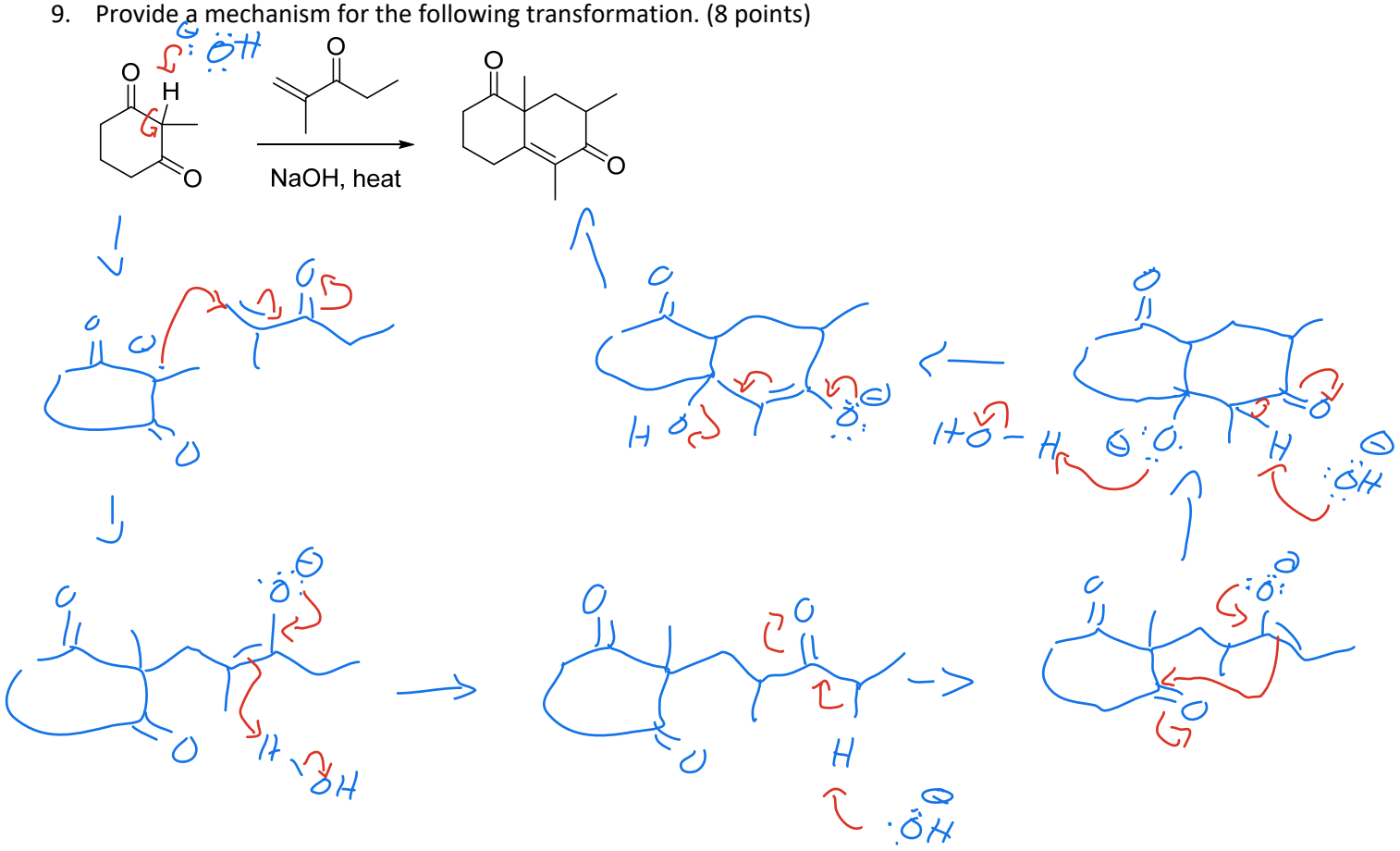


The regioselectivity is controlled by the stereospecific syn migratory insertion and β-hydride elimination steps. Only one beta hydrogen is appropriately position to undergo elimination after the syn migratory insertion step.

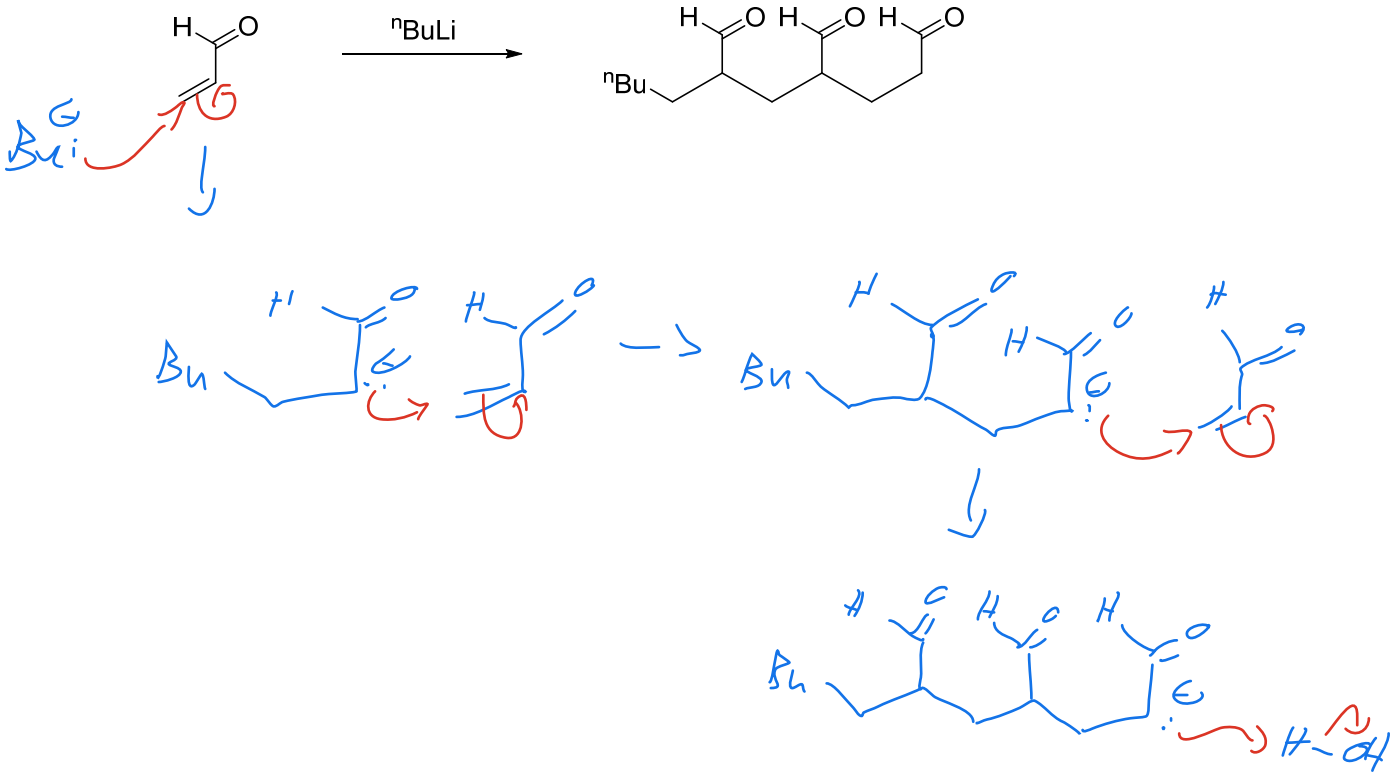
8. Provide a mechanism for the following reaction. (4 points)



9. Provide a mechanism for the following transformation. (8 points)

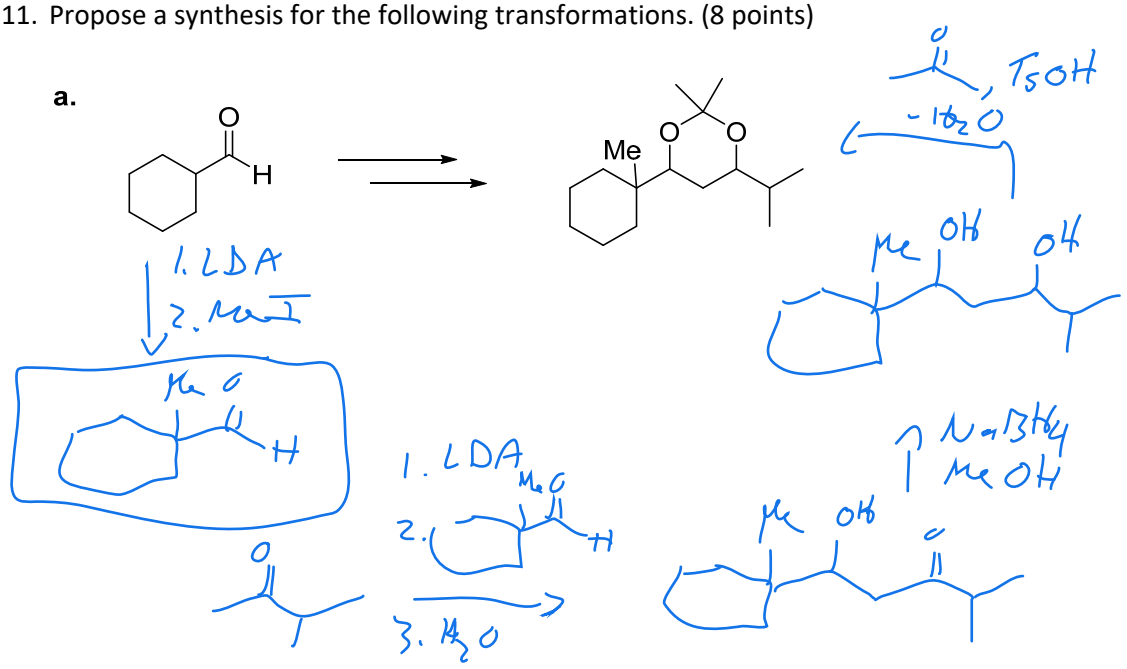


10. Provide a mechanism for account for the formation of the following polymer fragment. (4 points)



11. Propose a synthesis for the following transformations. (8 points)

a.



b.