

University of California, Los Angeles
Chem 14D – TaH Exam #2
Fall 2020 – 11/16/20

I hereby state that **I have neither given nor received aid to or from other people during this exam** (including external websites and programs). **I vouch for the honesty and integrity of each and every answer given.**

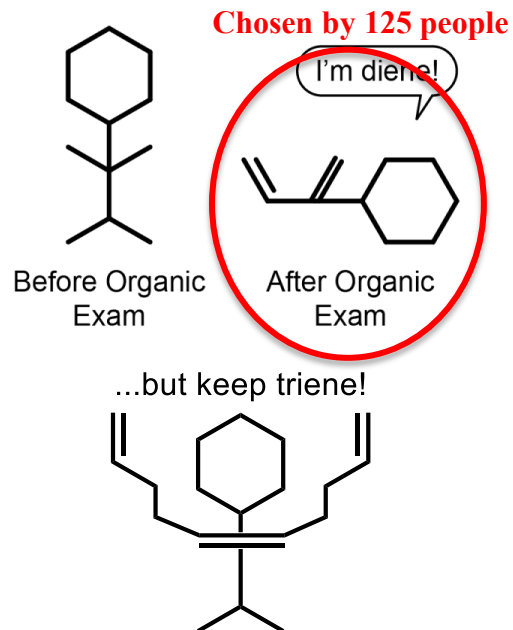
Signature _____ ID# _____

Circle your TA's name: Dominick Garrett Yiyi Eun Bin
 Brennan Shuaijing Tony

Use scratch paper first before inputting the answers onto the test for clearer scans onto Gradescope.

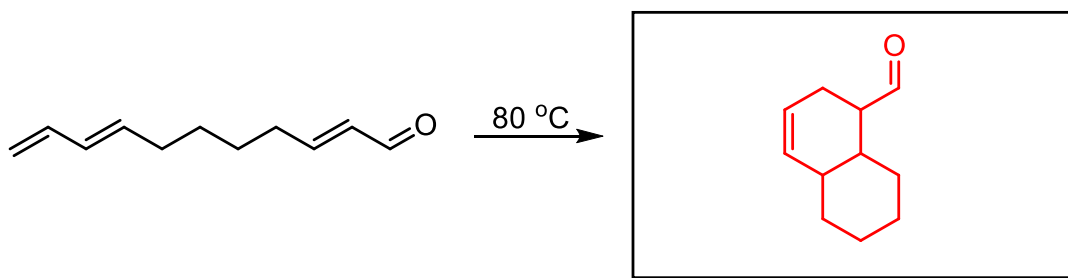
	Possible	Your score
I. This, That, or the Other	8	
II. Reactions, Pt. 1	20	
III. Mechanism	7.5	
IV. Reactions, Pt. 2	7.5	
V. Synthesis	8	
Bonus	0 (2)	
Total	50*	

*Yes, the total is 51, not 50. Think of it as 1 extra extra point. Good luck!



****Bonus:** Answer the next few questions (*after you finish your test!*) for some extra credit points. These are *strictly extra*, meaning that missing these will not be detrimental to your grade.

- a) (1 pt) Game theory! (*aka something you cannot look up the answer to*). Above this question, there are 3 different “organic humanoid molecules.” **Choose one by clearly circling it**; if your molecule is the **least chosen** amongst the class, you will earn 1 extra credit point.
- b) (1 pt) *All or nothing!* What **product** would be created below?

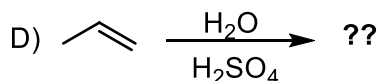
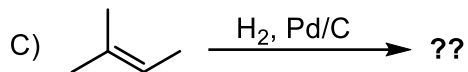
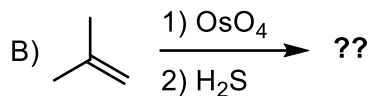
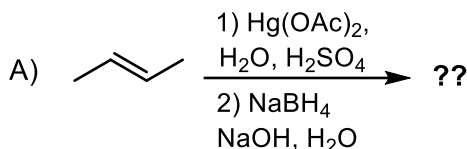


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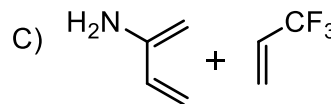
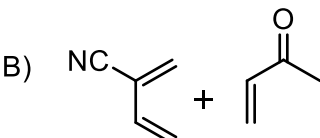
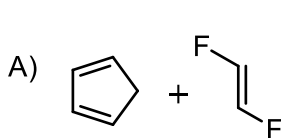
I. This, That, or the Other (8 pts; 1pt each) Choose the *best* answer and **write the letter of your answer in the box** next to the question number.

D

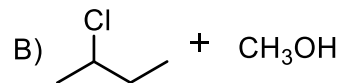
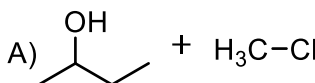
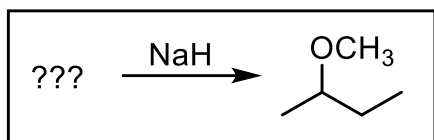
a) Which reaction results in a distinct **Markovnikov product** as the major product?

**B**

b) Which **Diels-Alder** reaction will occur the **slowest**?

**A**

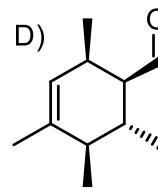
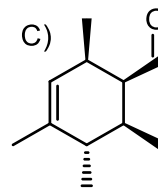
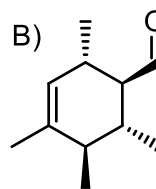
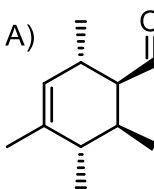
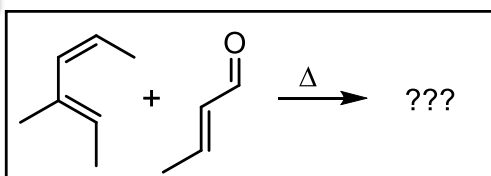
c) Which pair of reactants would be **more efficient** (faster) for synthesizing the following ether?



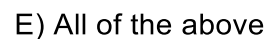
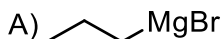
C) There is no difference between A and B

B

d) Choose the correct **major product** for the following reaction:

**C**

e) Which reagent could still **react as intended** when used with **EtOH** as a solvent?

**T**

f) True or False: The transformation **from an ester to an aldehyde** would be considered a **reduction** (of the carbonyl carbon).

F

g) True or False: A **retrosynthetic analysis** is always necessary to determine the most efficient synthetic route for creating a molecule.

F

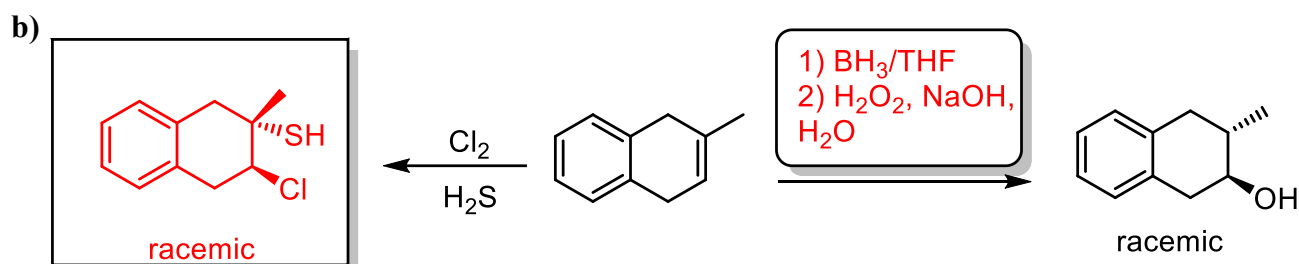
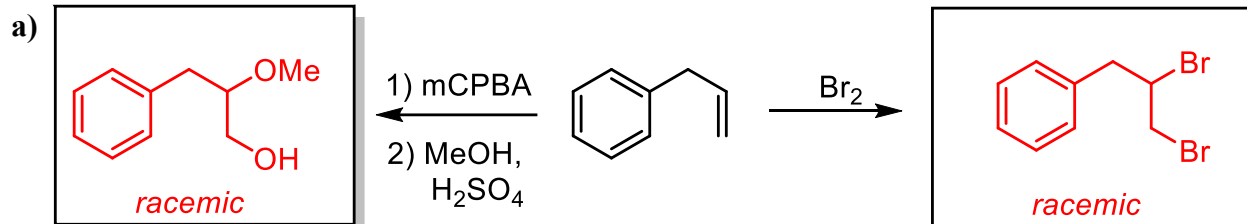
h) True or False: When drawing a mechanism, one should **never draw more than 3 curved arrows** in one step.

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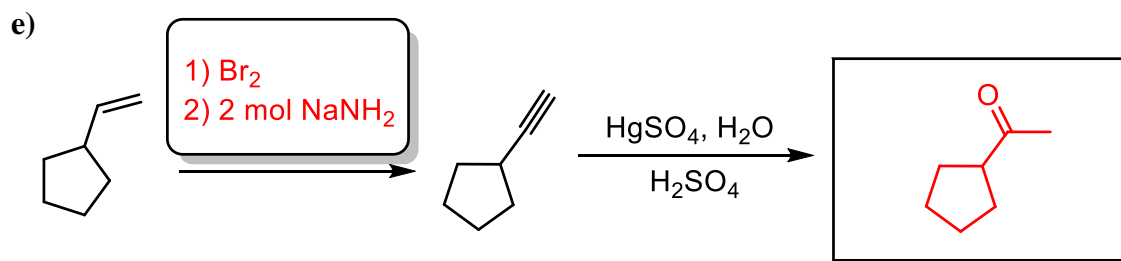
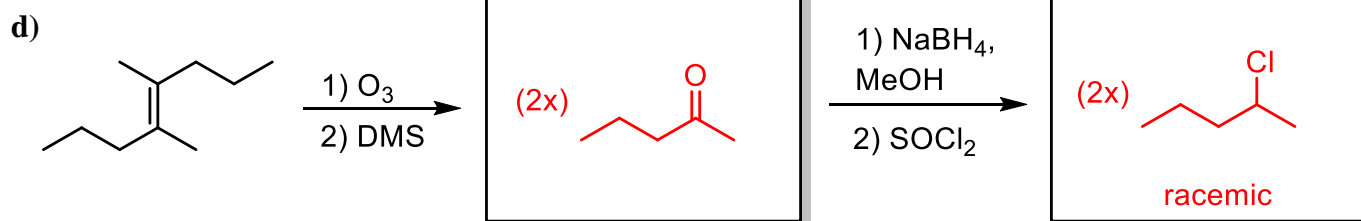
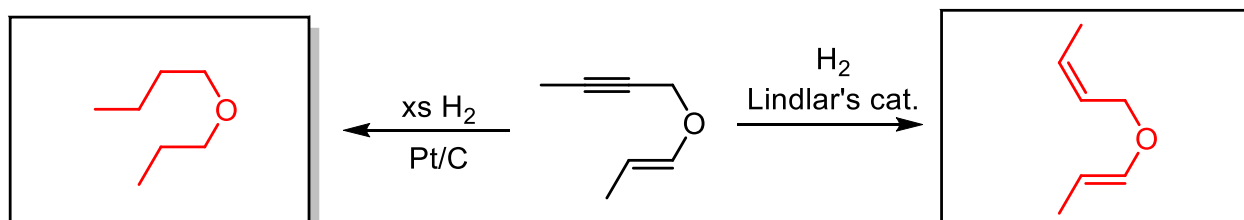
II. Reactions, Pt. 1 (20 pts; 2 pts each) Complete the following reactions by **drawing clear structures** for the missing **products** or filling in the necessary **reagents**.

Note on filling in the boxes:

- If the box is at an end of a reaction arrow, it is a **molecule(s)**. Give its structure clearly, **including stereochemistry** when relevant.
- If the box is on a reaction arrow, it is a **reagent(s)**. You may put multiple reagents in one box. If it requires multiple steps, **number your steps**.
- **Be neat!** Only what is written **inside the box** will be graded.

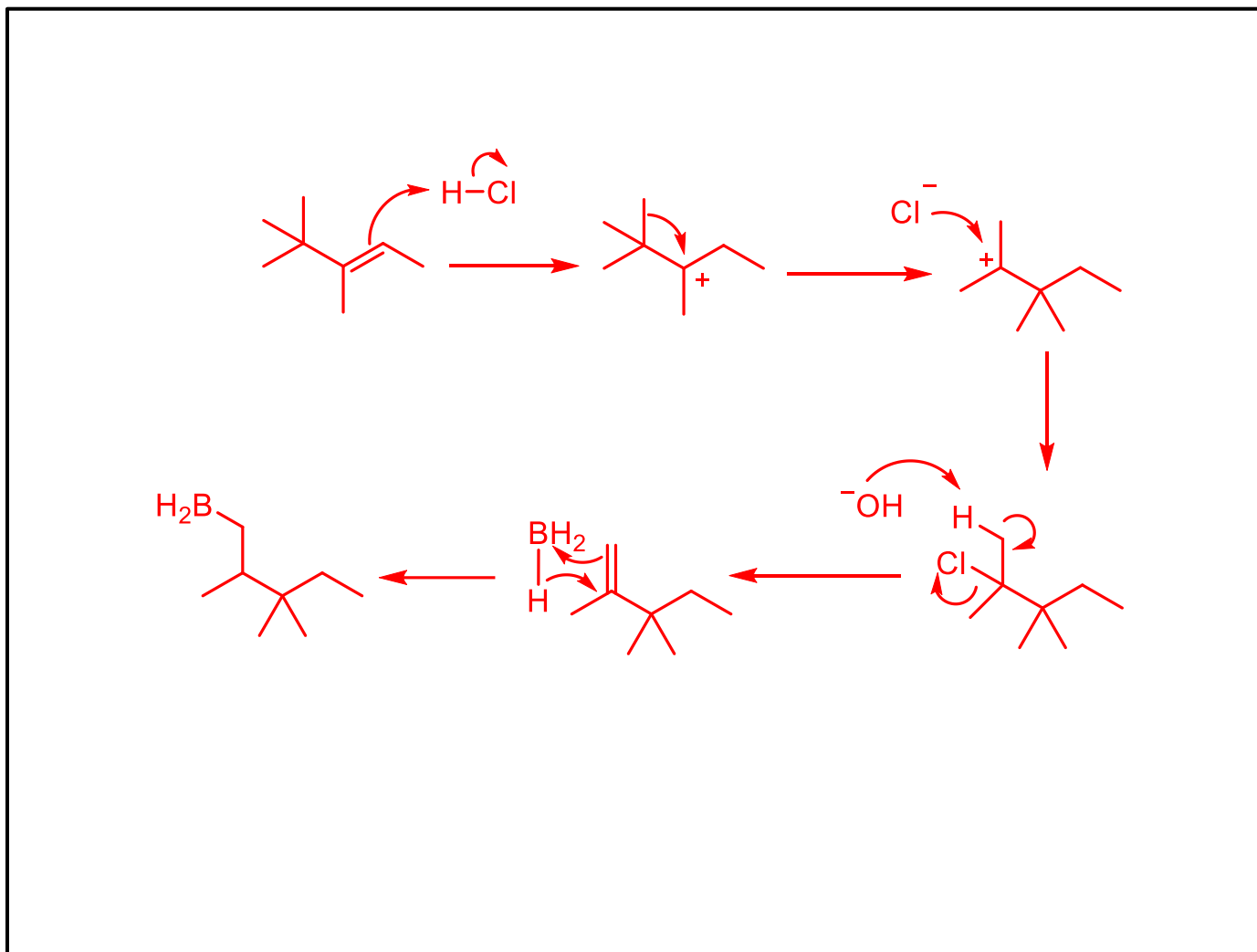
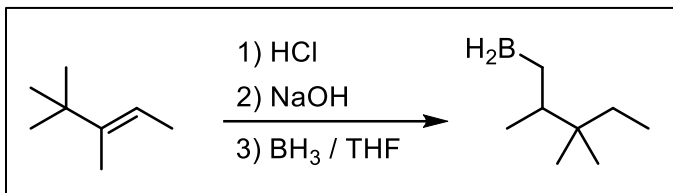


c) Note: "xs" means excess



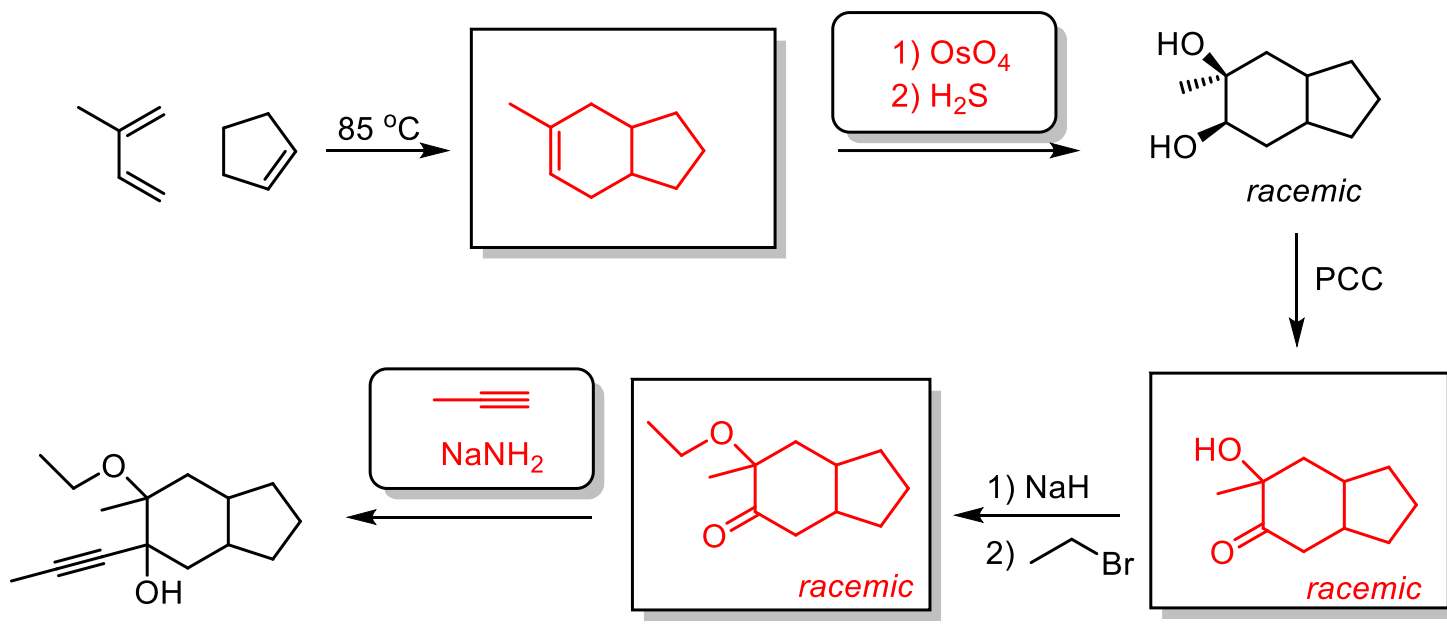
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III. Mechanism (7.5 pts) In the box provided, draw the **complete mechanism** for the entire reaction sequence below, using **curved arrows** to symbolize electron movement. Show **each mechanistic step** clearly and neatly, including **all intermediates and formal charges** when necessary. *Messiness may result in lost points.*



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IV. Reactions, Pt. 2 (7.5 pts; 1.5 pts each) Fill in the missing molecules and reagents to complete the synthesis. For instructions on filling in boxes, refer to Reactions, Pt. 1.



V. Synthesis (8 pts) Show how the following **multi-step chemical transformation** can take place. Provide reagents for each step in the synthesis. Include **structures of intermediate products** that could be isolated after each step. Do **not** provide a mechanism or curved arrows. Be clear! Messiness may result in lost points. Note: There is often more than one correct answer! You may disregard stereochemistry for this problem.

Important: All carbons in the product should come from butene.

