

Fourth Exam
CHEM 256 – Organic Chemistry II
Prof. Bastin
Spring 2015

Name _____

Section _____

1. DO NOT START this exam until you are instructed to begin.
2. There are TWELVE pages including this cover sheet - make sure they are all here!
3. Provide *CLEAR, CONCISE* answers using unambiguous, carefully drawn structures and mechanisms. *Be sure to read each question VERY CAREFULLY.*
4. Do not provide mechanisms for synthesis and product prediction problems.
5. You may only use a pen or pencil and the materials provided in this packet on this exam.
6. If you have papers and/or books with you, they are to be left on the floor **AT THE FRONT OF THE ROOM**. If you need scrap paper please ask.
7. Cell phones must be **OFF and placed on the table at the FRONT of the ROOM**.
8. Any talking, gesturing, or other inappropriate actions will result in the immediate confiscation of your exam. The offending student(s) will receive a zero on the exam, a letter grade reduction in the course, and be reported to the Associate Provost office.

1) _____/14 pts

2) _____/16 pts

3) _____/16 pts

4) _____/14 pts

Total: _____/100 pts

5) _____/10 pts

6) _____/10 pts

7) _____/20 pts

1) (14 pts) Provide structures for the following compounds.

a) Butyl acetate

b) 3-hydroxyheptanoic acid

c) *N,N*-dibutylhexanamide

d) 2,4,6-trioxooctanoic acid

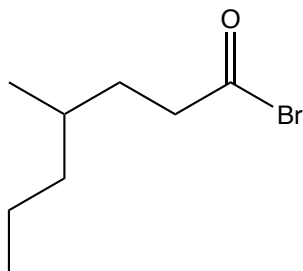
e) Glutaric acid

f) Benzoyl chloride

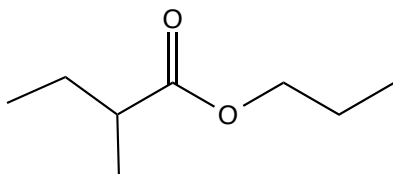
g) ethanoic pentanoic anhydride

2) (16 pts) Provide either common or IUPAC names for the following compounds?

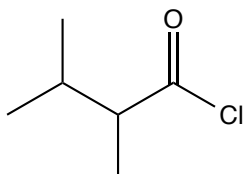
a)



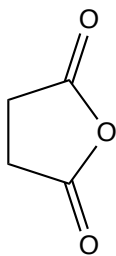
b)



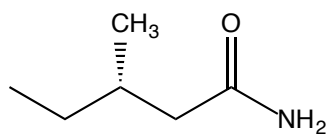
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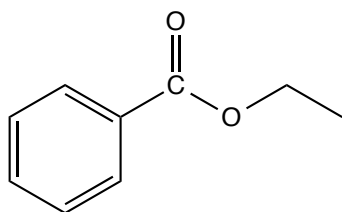
d)



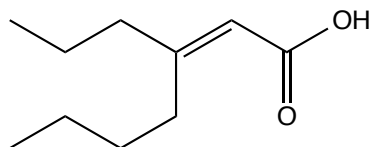
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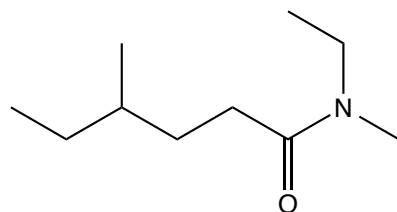
f)



g)

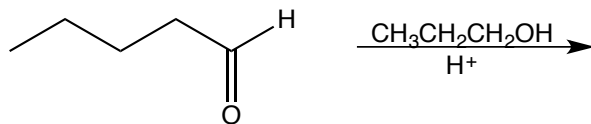


h)

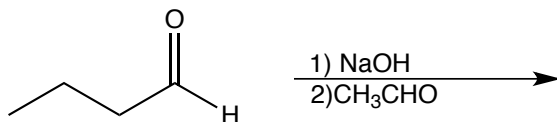


3) (16 pts) Draw the organic product(s), if any, of the following reactions. Indicate stereochemistry where relevant.

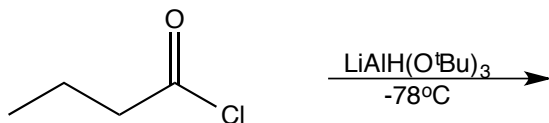
a)



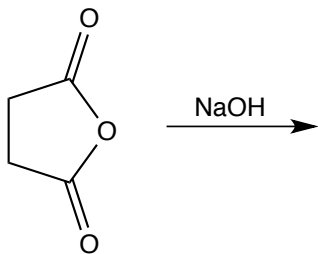
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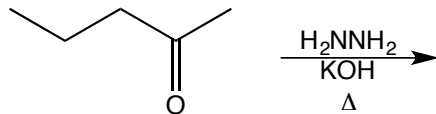
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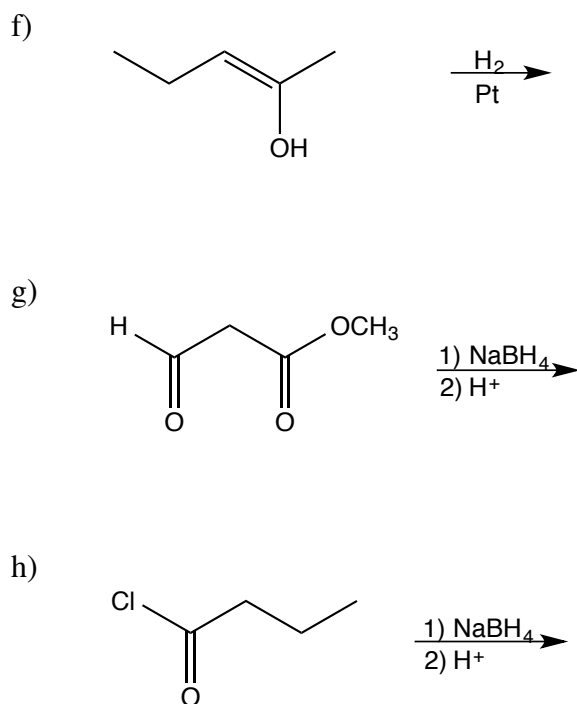


d)



e)



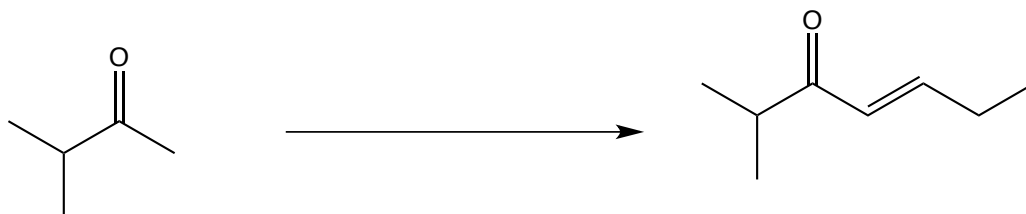


4) (14 pts) Provide the reagents needed to bring about the following transformations.

a)



b)



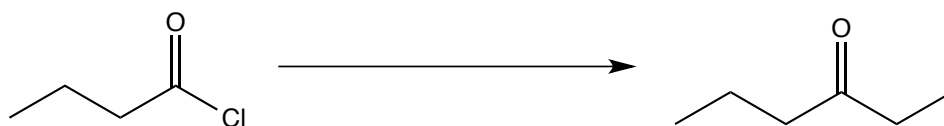
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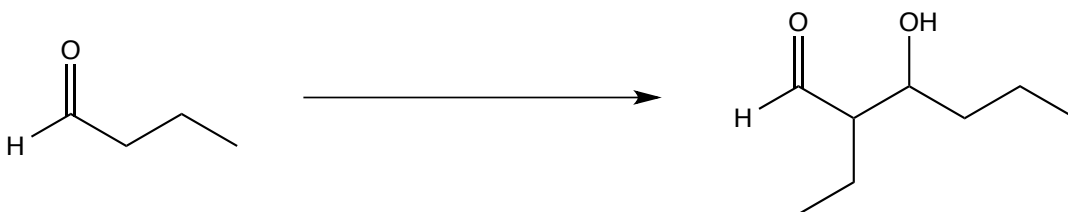
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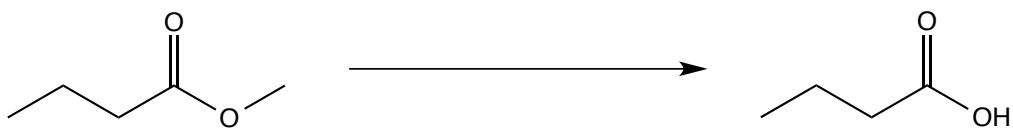
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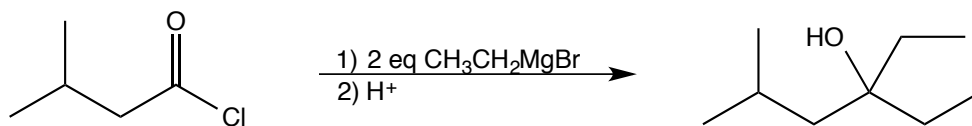
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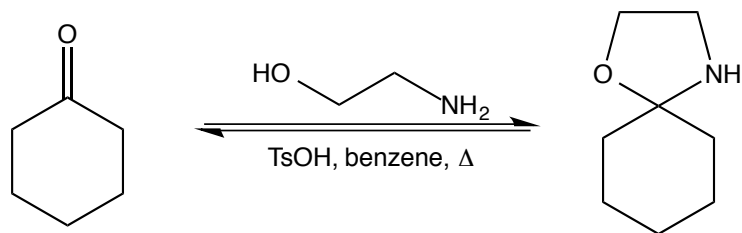
g)



- 5) (10 pts) Draw the complete, detailed mechanism for the following reaction. TsOH is a relatively acidic compound.

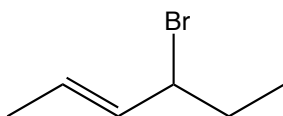


- 6) (10 pts) Draw the complete, detailed mechanism for the following reaction. TsOH is a relatively acidic compound.

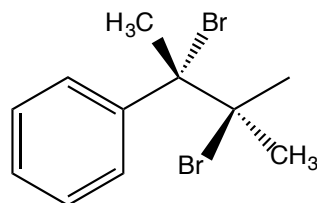
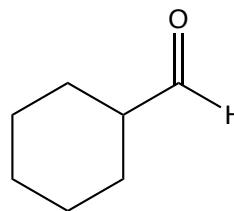
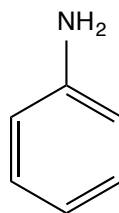
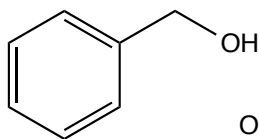
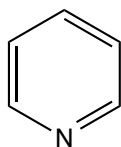
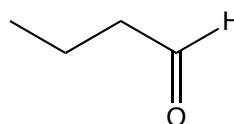
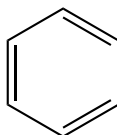
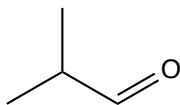
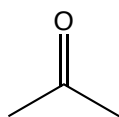


- 7) (20 pts) Propose the best synthesis for each of the following molecules. You can only use those organic molecules found in the Toolbox below and any inorganic reagents.

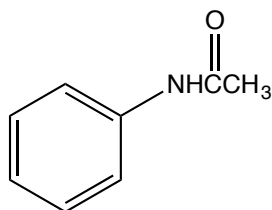
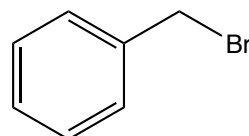
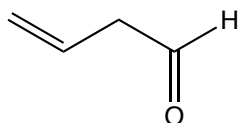
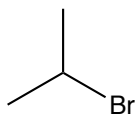
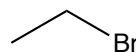
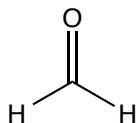
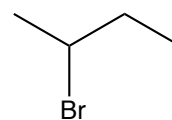
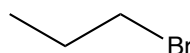
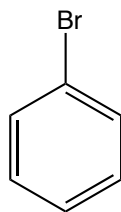
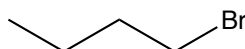
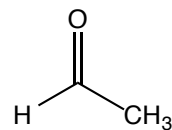
(a)



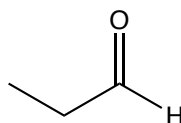
(b)

**Toolbox**

nBuLi

CH₃I

NaCN

CH₃Br