EXAM 4

CHEMISTRY 220a

Friday, December 8, 2000

NAME (print): _____

TA:_____ Day:_____ Time:_____

Take a few moments to look over the exam. Answer each question on the exam paper.

Write your name on the top of each page where indicated.

Important items are in **bold**.

A **Periodic Table** is on page 9.

Do all **preliminary** drawing or computations on the **work sheets** (pgs. 6-8). The work sheets will not be graded.

The exam is 55 minutes.

STOP writing and hand in your exam when you are asked to do so.

REMEMBER: Neatness is to your advantage.

1. (25 pts) _____

2. (23 pts) _____

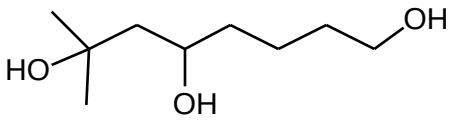
3. (24 pts) _____

4. (28 pts) _____

_____

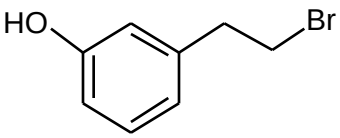
Total (100 pts)

1) (5 x 5 pts. = 25 pts.) Provide the products in each of the following reactions. **Pay attention to stereochemistry** where applicable.

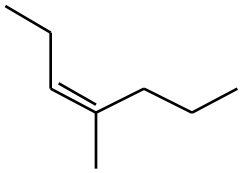
a) 

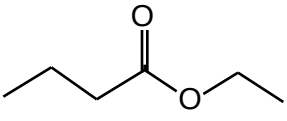
pyridine chlorochromate
(PCC)

b) (R)--2-pentanol
1) TsCl, pyridine
2) Li Br

c) 

1) Mg, ether
2) CH_2O

d) 
catalytic OsO_4, HIO_4

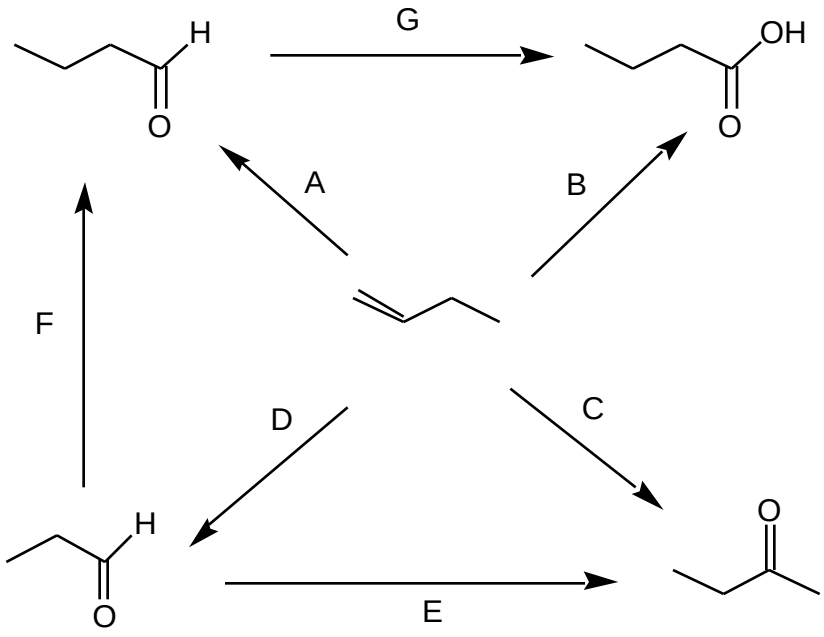
e) 

excess CH_3MgBr
two products

2) (23 pts.) Design a synthesis of 3-hexanone using 1-propene as the **only** source of carbon. **No acetylene chemistry.** All reagents are available to you.

3) (24 pts.) Compound **A** (C_7H_{14}) reacts with cat. OsO_4/HIO_4 to form **B** (C_3H_6O) and **C**. Compound **B** does not react with PCC (pyridinium chlorochromate) in CH_2Cl_2 as solvent. When water is added to this reaction mixture, **D** ($C_3H_6O_2$) is formed. Compound **C** does not react with PCC or $K_2Cr_2O_7$/aqueous H_2SO_4. What are the structures of **A**-**D**? Explain. What limitation is placed on your answer?

4) (7 x 4 pts. = 28 pts.) Provide the reagents necessary to complete the reaction sequences **A-G**. Some transformations require more than one step. All C_1 carbon sources and reagents are available to you. **Transformation D is a reaction from Chapter 11.**



A:

B:

C:

D:

E:

F:

G:

Work Sheets

Work Sheets

Work Sheets

Periodic Table