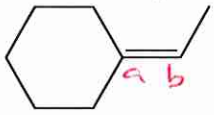
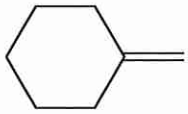
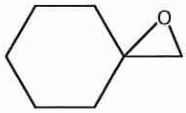
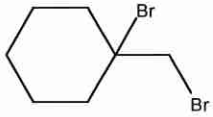
Assignment # 14
Organic 211
Fall 2020

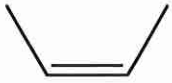
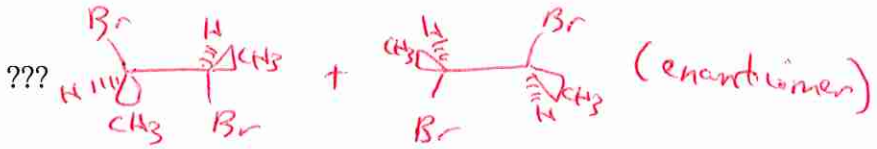
Name:_____

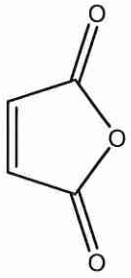
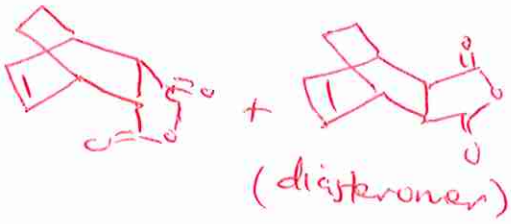
1) Give the missing reactant, reagent, or product for the following reactions. Show stereochemistry if important.

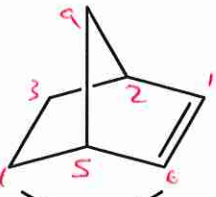
a)  1) O_3 2) Zn → ??? 

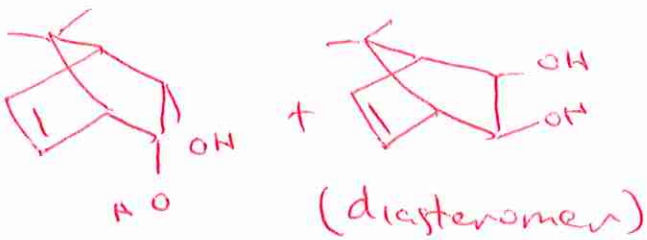
b)  ???? →  MCPBA or any peracid

c) ???? Br_2, CCl_4 →  

d)  Br_2/CCl_4 → ??? 

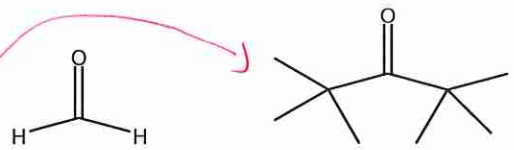
e)  +  → ?? Diels-Alder 

f)  1) O_3 2) Zn → ?? 

g)  1) OsO_4 2) $KHSO_3$ → ?? 

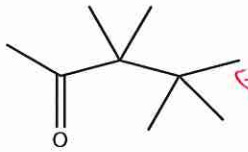
2) Dehydration of 2,2,3,4,4-pentamethyl-3-pentanol gave two alkenes A and B. Ozonolysis of the lower boiling alkene gave formaldehyde and 2,2,4,4-tetramethyl-3-pentanone. Ozonolysis of B gave formaldehyde and 3,3,4,4-tetramethyl-2-pentanone. Identify A and B and suggest an explanation for the formation of B in the dehydration reaction.

rearrangement



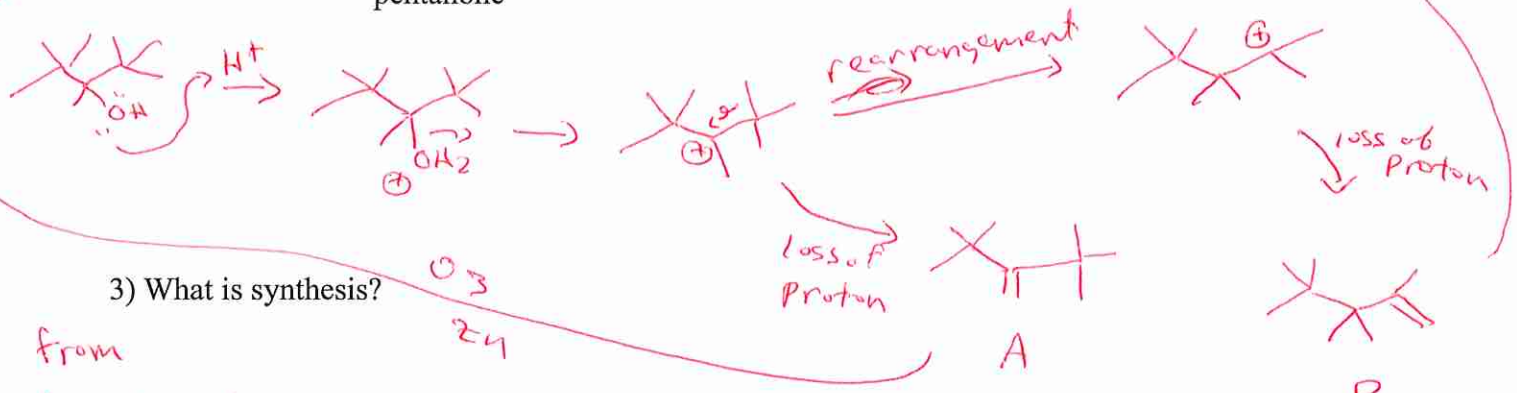
Formaldehyde

2,2,4,4-tetramethyl-3-pentanone



3,3,4-4-tetramethyl-2-pentanone

O_3/Zn



3) What is synthesis?

O_3
Zn

from Google: the production of chemical compounds by reaction from "simpler" materials. Simple???

4) What are the two types of synthesis?

A → B → C → D → E Linear

A → B
C → D → E Convergent

5) Which type of synthesis usually gives a higher percent yield

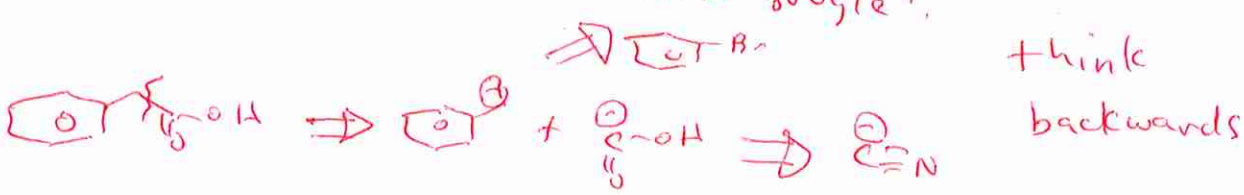
Convergent has fewer steps so usually higher yield.

6) Show the yield for a four step reaction with step 1 working in 60 % yield, step 2 in 90 % yield, step 3 in 84 % yield, and step 4 in 66 % yield. SHOW YOUR WORK!!

A $\xrightarrow{60\%}$ B $\xrightarrow{90\%}$ C $\xrightarrow{84\%}$ D $\xrightarrow{66\%}$ E

$\therefore$ .6 X .9 X .84 X .66 = 29.9

7) Give an example of a retrosynthetic analysis. from Google:



think backwards