

**Chem 233: Problem Set #9B (on Chapter 9)**

1. Consider reaction of the reagents shown below with 2-pentene.

I.  $\text{BH}_3$  in THF  
 $\text{H}_2\text{O}_2, \text{H}_2\text{O}, \text{OH}^-$

II.  $\text{H}_2, \text{Pd/C}$

III.  $\text{Br}_2$  in  $\text{CH}_2\text{Cl}_2$

IV.  $\text{HCl}$  in ether

V.  $\text{Hg}(\text{OAc})_2, \text{H}_2\text{O/THF}$   
 $\text{NaBH}_4$

VI.  $\text{OsO}_4$   
 $\text{NaHSO}_3, \text{H}_2\text{O}$

VII.  $\text{Br}_2, \text{H}_2\text{O}$

VIII.  $\text{H}_2\text{O}, \text{H}^+$

A. Which react with syn-stereochemistry?

B. Which react with anti-stereochemistry?

C. Which react with both syn- and anti-stereochemistry?

Continued on Back

2. Give all stereoisomer products obtained for each of the reactions shown below. Identify the relationship (enantiomers, diastereomers) between stereoisomer products. Decide whether the product or product mixture is optically active or inactive.

