

Seat No. \_\_\_\_\_

Name \_\_\_\_\_  
(Please print your name and **circle** your last name)

**CHEMISTRY 331**

**EXAM II**

Monday, March 3, 2008

- I. ( 6 points) \_\_\_\_\_
- II. ( 8 points) \_\_\_\_\_
- III. ( 8 points) \_\_\_\_\_
- IV. ( 8 points) \_\_\_\_\_
- V. (30 points) \_\_\_\_\_
- VI. (15 points) \_\_\_\_\_
- VII. (15 points) \_\_\_\_\_
- VIII. (12 points) \_\_\_\_\_

\_\_\_\_\_

TOTAL(100 points  $\pm$  2 pts) \_\_\_\_\_

I. (6 pts.) Classify each of the following reactions as:

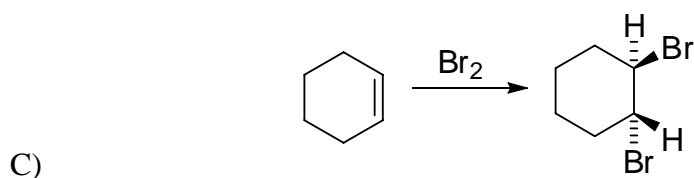
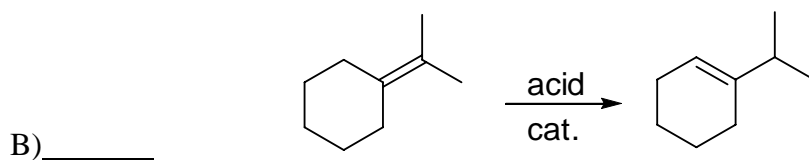
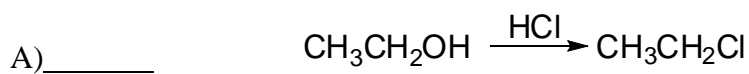
a) addition

b) elimination

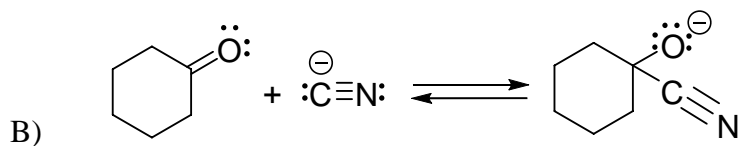
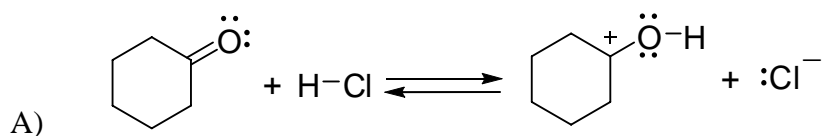
c) substitution

d) rearrangement

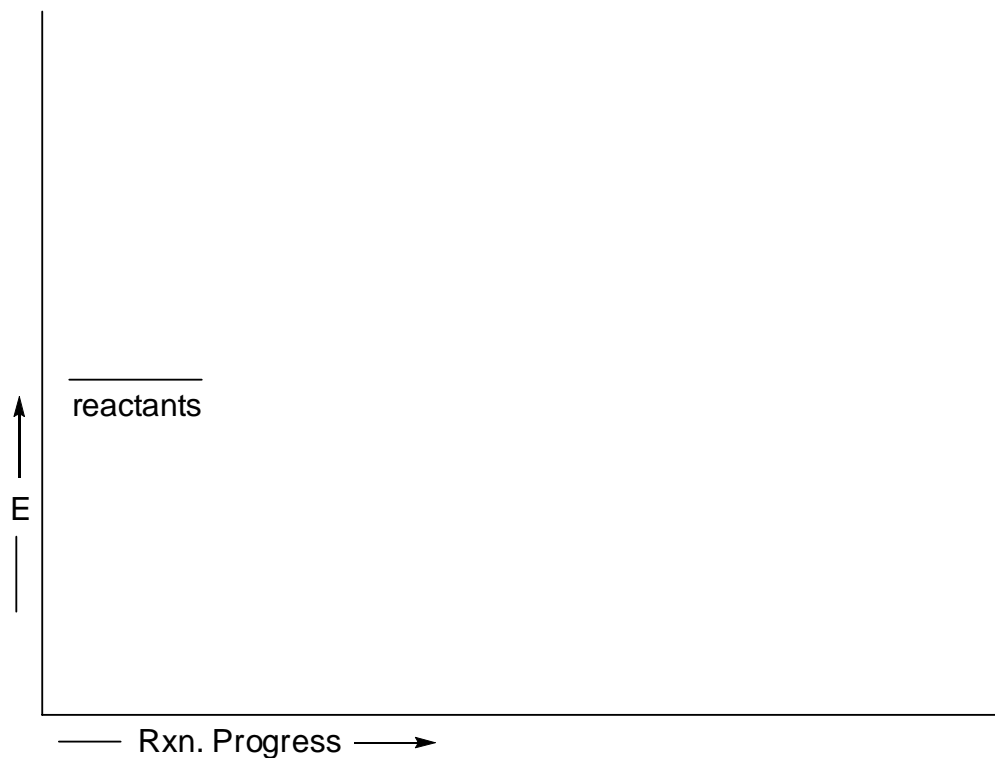
by placing the letter corresponding to the correct answer in the blank space provided.



II. (8 pts.) Add curved arrows to indicate the flow of electrons and identify the nucleophile (w/N) and electrophile (w/E) for the reagents on the left side of both equations.

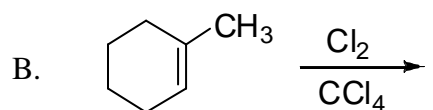
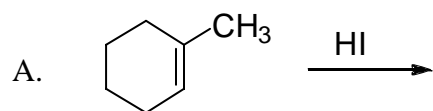


- III. (8 pts.) Draw a qualitative energy diagram for a 2-step reaction in which (1) the first step is the slowest, (2) formation of the intermediate is endergonic but (3) the overall reaction is exergonic.

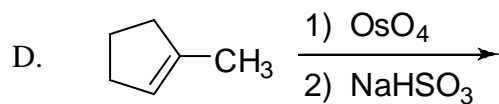
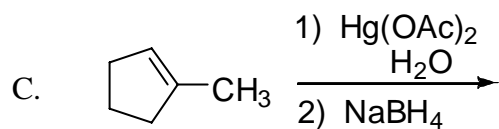


- IV. (8 pts.) A compound w/ the molecular formula of  $C_7H_{10}O$  takes up 2 mol equivalents of  $H_2$  upon catalytic hydrogenation. Provide a reasonable structure for this compound.

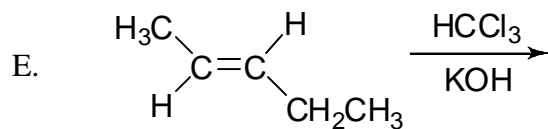
V. (30 pts.) Complete the following reactions w/the expected major products.



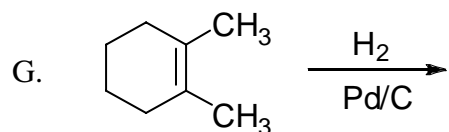
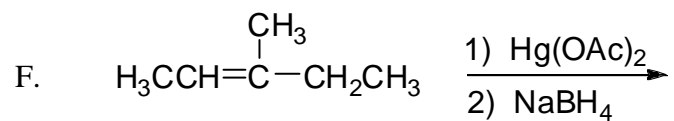
indicate stereochem.



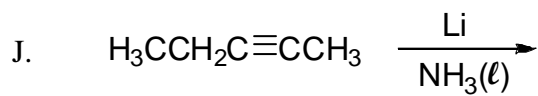
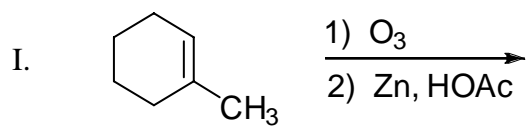
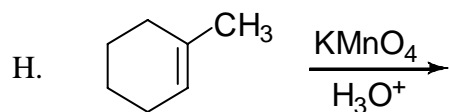
indicate stereochem.



indicate stereochem.

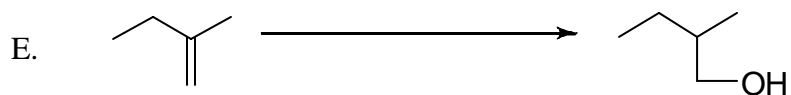
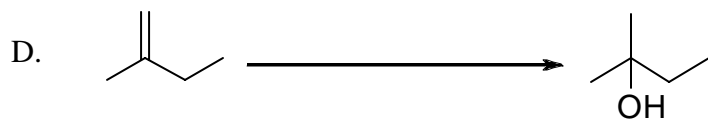
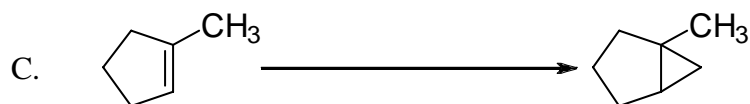
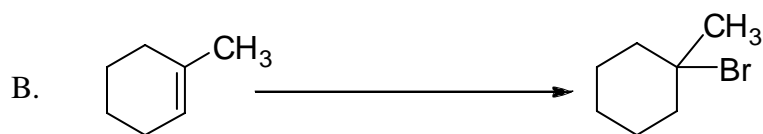
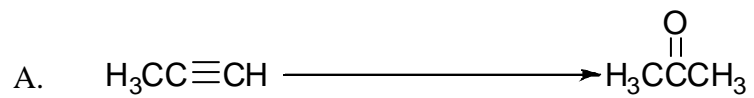


indicate stereochem.

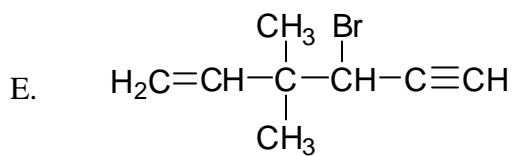
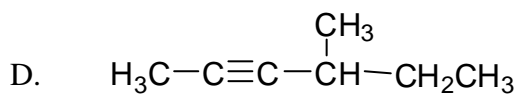
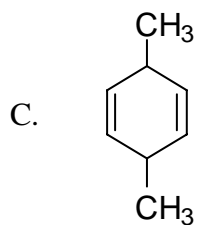
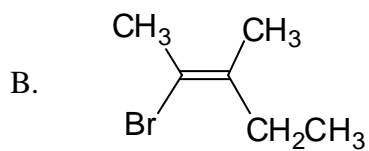
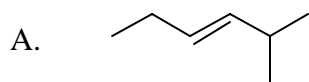


indicate stereochem.

VI. (15 pts.) Over (and/or under) the reaction arrows provide the reagents necessary to carry out the following reactions.



VII. (15 pts.) Provide correct and complete names for the following compounds.



VIII. (12 pts.) Using acetylene (ethyne) and any necessary alkyl halides as starting materials show how you would perform the following syntheses. Include all reagents for each synthetic step.

