

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

LAST NAME WST

FIRST NAME \_\_\_\_\_

There are 7 pages to this exam. Check to make sure you have a complete exam.

PLEASE ALSO PRINT YOUR NAME ON THE TOP OF  
THE **BACK** OF THE LAST PAGE OF THE EXAM

**CHEMISTRY 331**

**EXAM III**

Spring 2007 (3/9/07)

I. (22 points) \_\_\_\_\_

II. (24 points) \_\_\_\_\_

III. ( 8 points) \_\_\_\_\_

IV. (17 points) \_\_\_\_\_

V. (16 points) \_\_\_\_\_

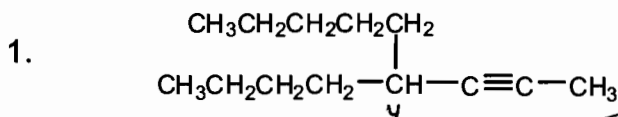
VI. (13 points) \_\_\_\_\_

TOTAL (100 points) \_\_\_\_\_

I. (22 pts)

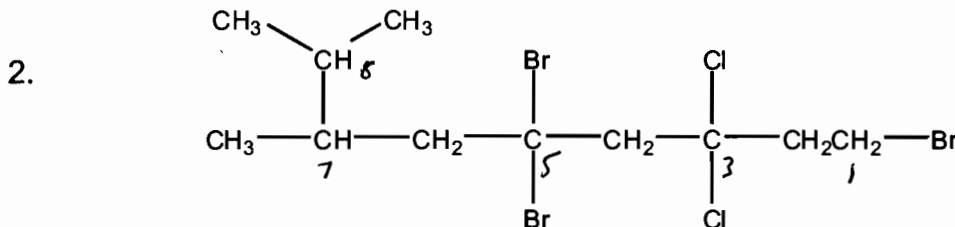
A. (6 pts) Give a correct name for each of the following compounds.

1 pt = correct numbers  
 1 pt = correct substituents  
 1 pt = correct parent + ending



4-butyl-2-nonyne

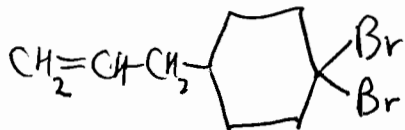
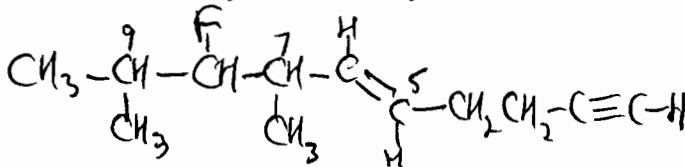
Or 2 here  
 or here



1,5,5-tribromo-3,3-dichloro-7,8-dimethylnonane

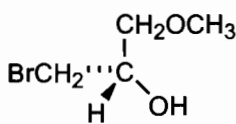
B. (6 pts) Give a correct structure for each of the following names.

1. 4-allyl-1,1-dibromocyclohexane

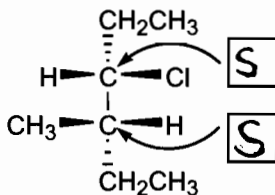
2. *E*-8-fluoro-7,9-dimethyldeca-5-en-1-yne

1 pt parent chain  
 1 pt correct substituents  
 in correct positions  
 1 pt E.

C. (10 pts) Assign R or S to the following stereogenic (chiral) centers.



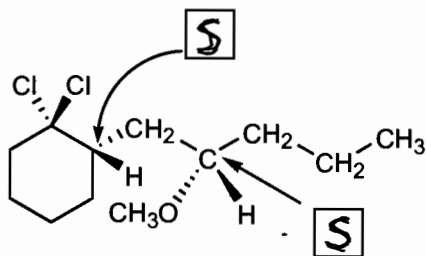
**S**



**S**

**S**

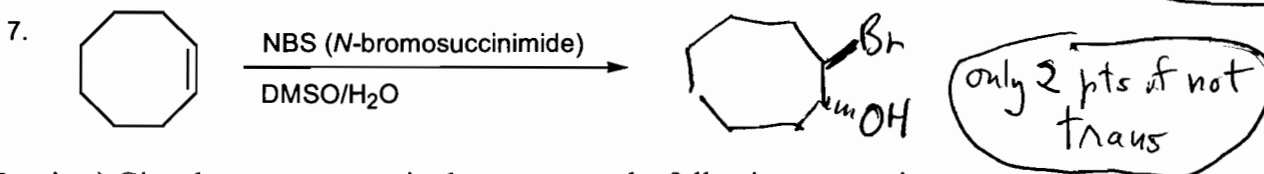
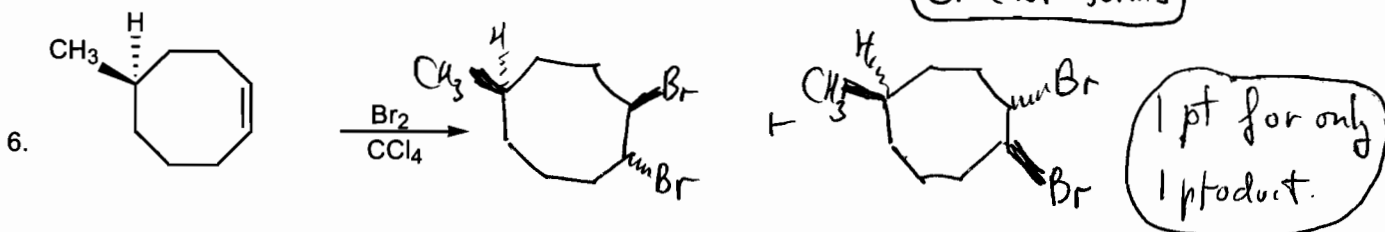
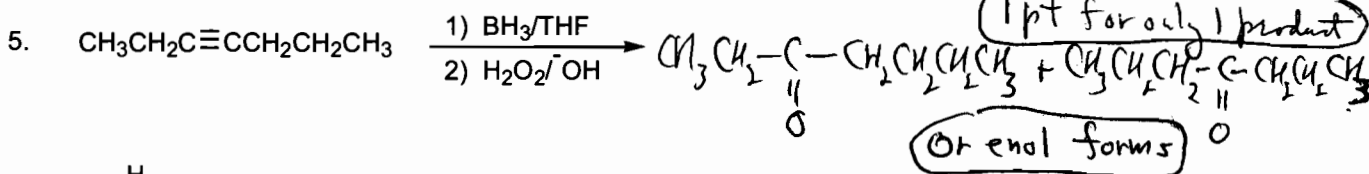
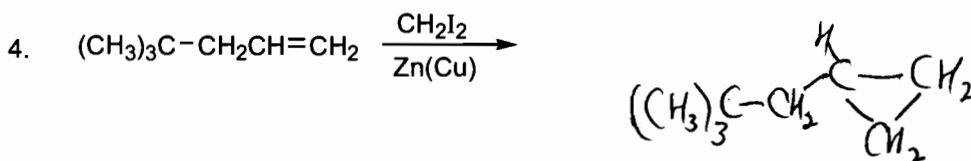
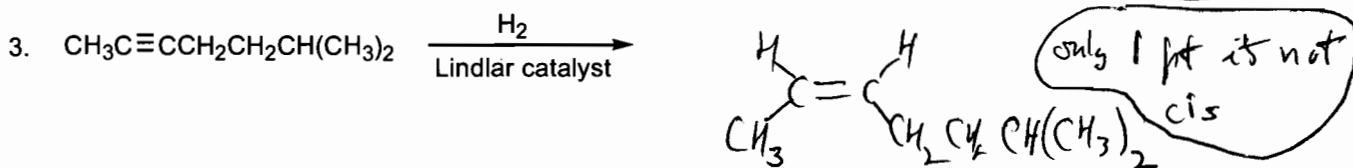
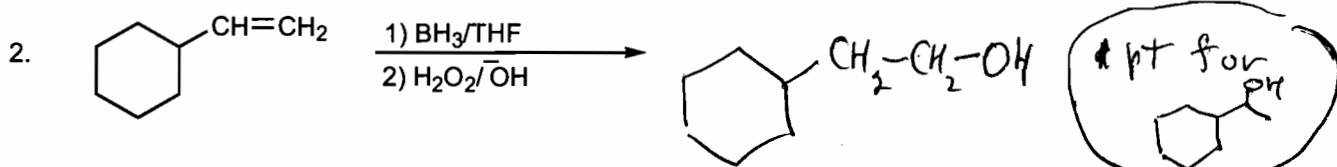
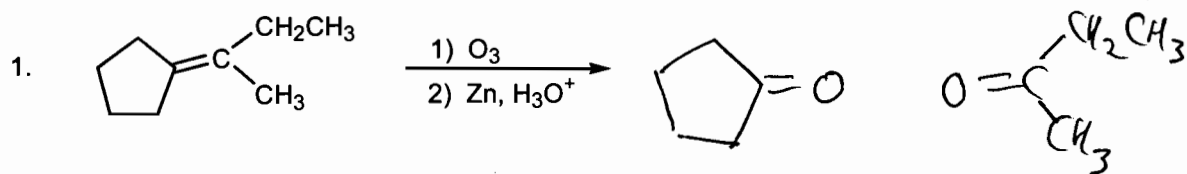
2 pts each



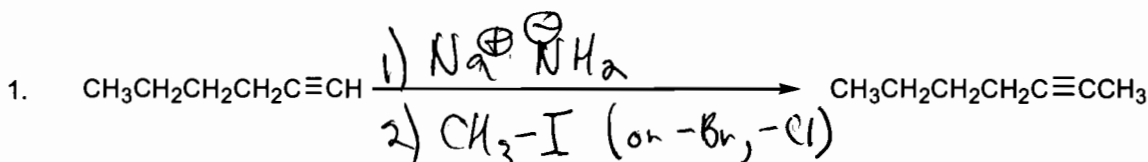
**S**

**S**

II. (24 pts)

A. (21 points) Complete the following equations giving all organic products. Stereochemistry must be clearly indicated in reactions which are stereoselective.

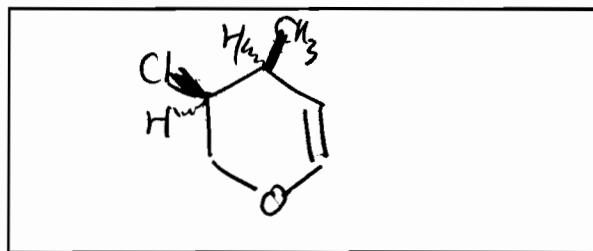
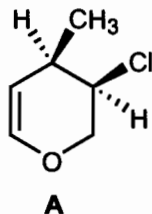
B. (3 points) Give the reagents required to carry out the following conversion.



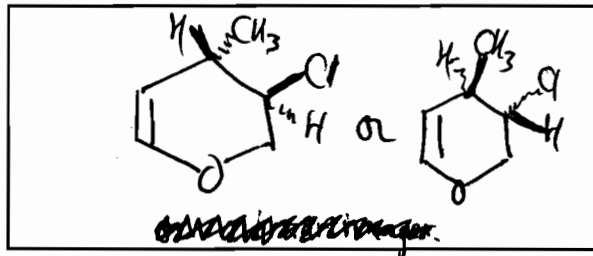


IV. (17 pts) Complete the following.

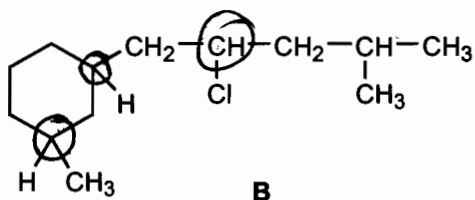
A. In the box provided, draw the enantiomer of A.



B. In the box provided, draw a diastereomer of A.



C. Circle the stereogenic (chiral) centers of B.



D. (2 pts) How many stereoisomers have the constitution of structure B?

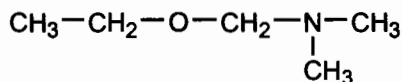
$$2^3 = 8$$

E. Indicate whether the following statements are True or False by circling T or F.

**T**  **F** 1. The resolution of racemic mixtures often involves the formation of diastereomers.

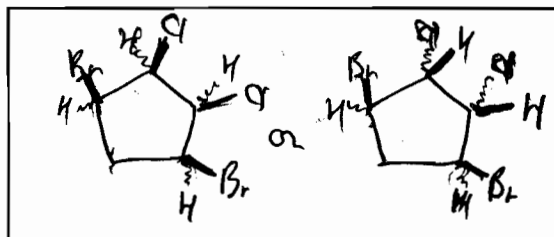
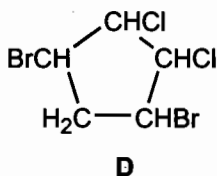
**T**  **F** 2. Chiral compounds from natural sources are rarely single enantiomers.

**T**  **F** 3. Compound C (below) has two prochiral centers.

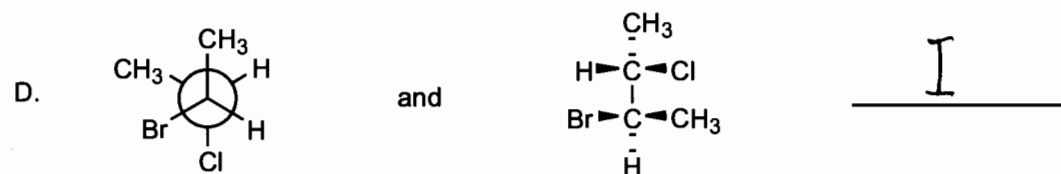
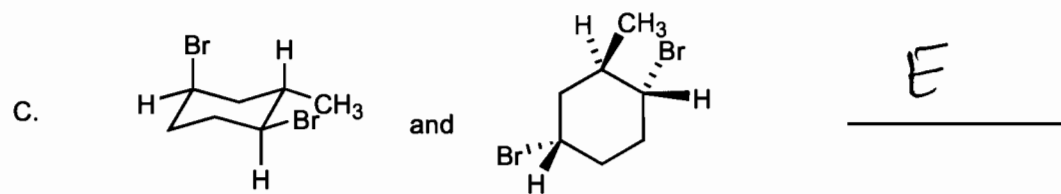
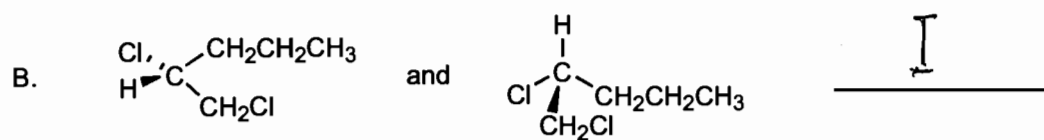
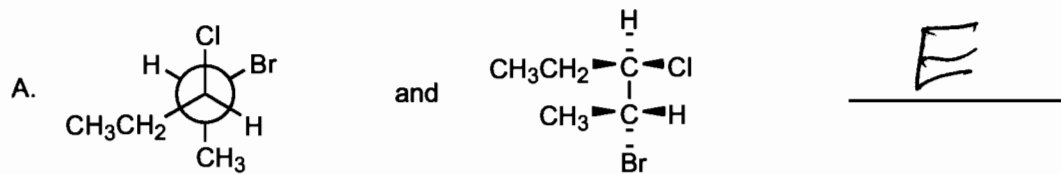


**C**

F. In the box provided, draw a meso stereoisomer that has the constitution of structure D.

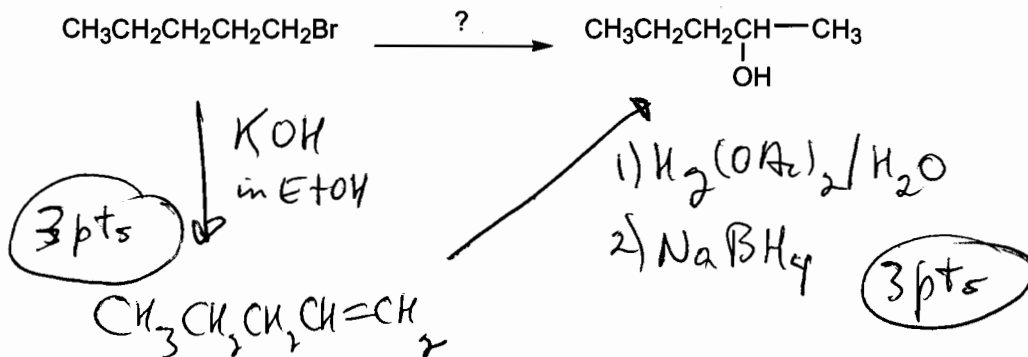


V. (16 pts) Label each pair of structures as I (identical), E (enantiomers), D (diastereomers) or C (constitutional isomers – not stereoisomers).



VI. (13 pts) Beginning with the starting material indicated, show how to achieve each of the following syntheses by showing all the reactions that are needed. (For each reaction, give the starting material, conditions over the arrow, and the products). You may use any inorganic compound or organic compound with one or two carbons.

A. (6 pts)



B. (7 pts)

