

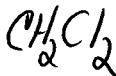
Blue (Version A)

Partial Credit (Use a pen to fill out the remaining questions on the exam itself. Circle the answer to be graded.)

16. Give a structure (line or structural) for each of the following compounds. Show (6) cis/trans stereochemistry where appropriate.

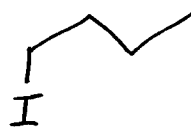
A. methylene chloride

(1)



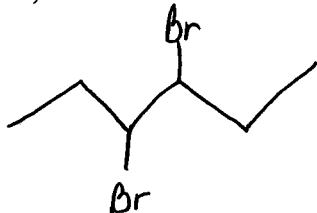
B. n-butyl iodide

(1)



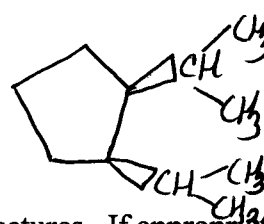
C. 3,4-dibromohexane

(2)



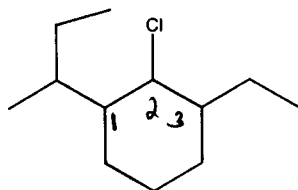
D. cis-1,2-diisopropylcyclopentane

(2)



17. Give a correct IUPAC name for each of the following structures. If appropriate, include (10) cis/trans stereochemistry.

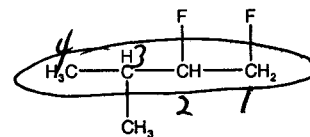
A.



B.



C.

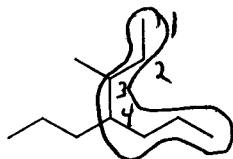


1,2-difluoro-3-methylbutane

1-sec-butyl-2-chloro-3-ethylcyclohexane

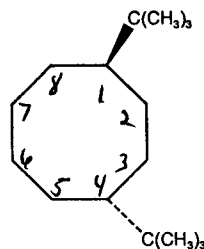
4-ethyl-2,3,5-trimethylheptane

D.



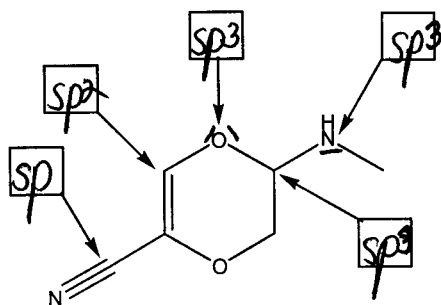
3-methyl-4-propylheptane

E.

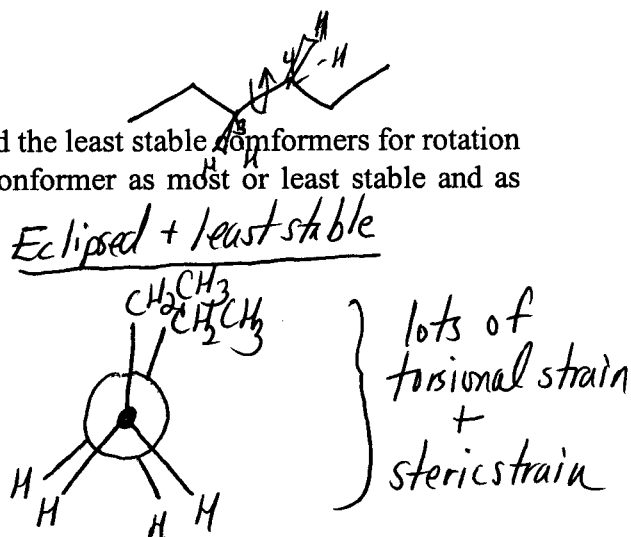
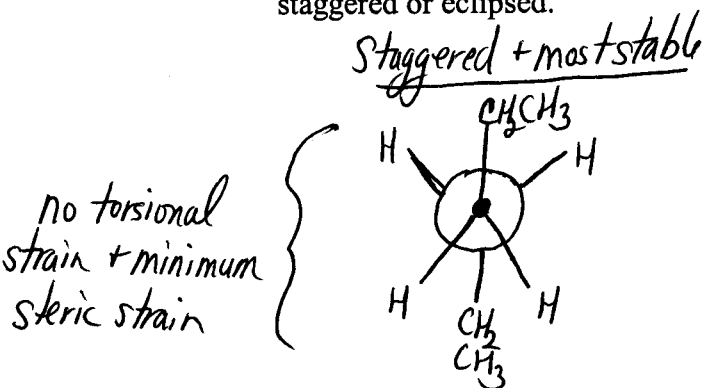


trans-1,4-di-t-butylcyclooctane

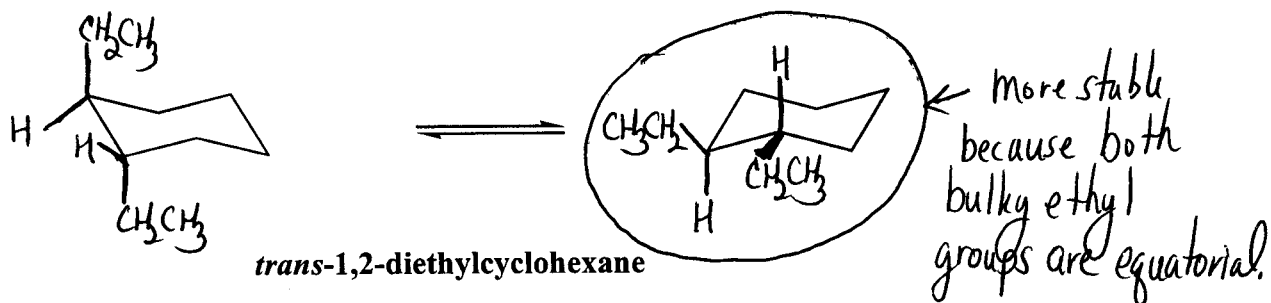
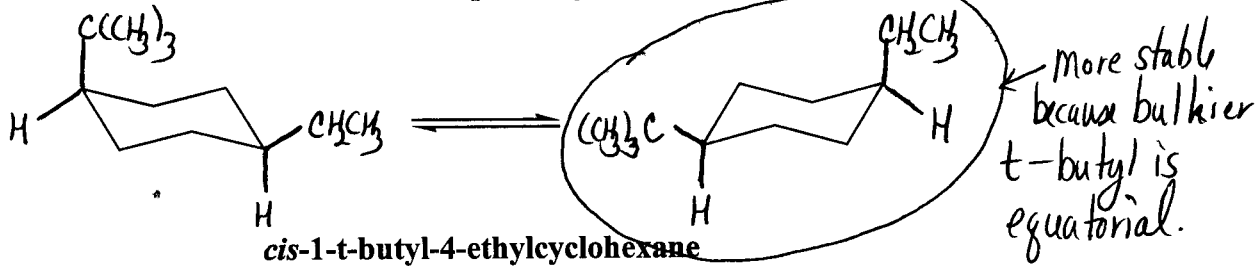
18. What type of hybridization is used by each non-hydrogen atom indicated with an arrow in the following compound? Fill in the boxes with the correct answers.



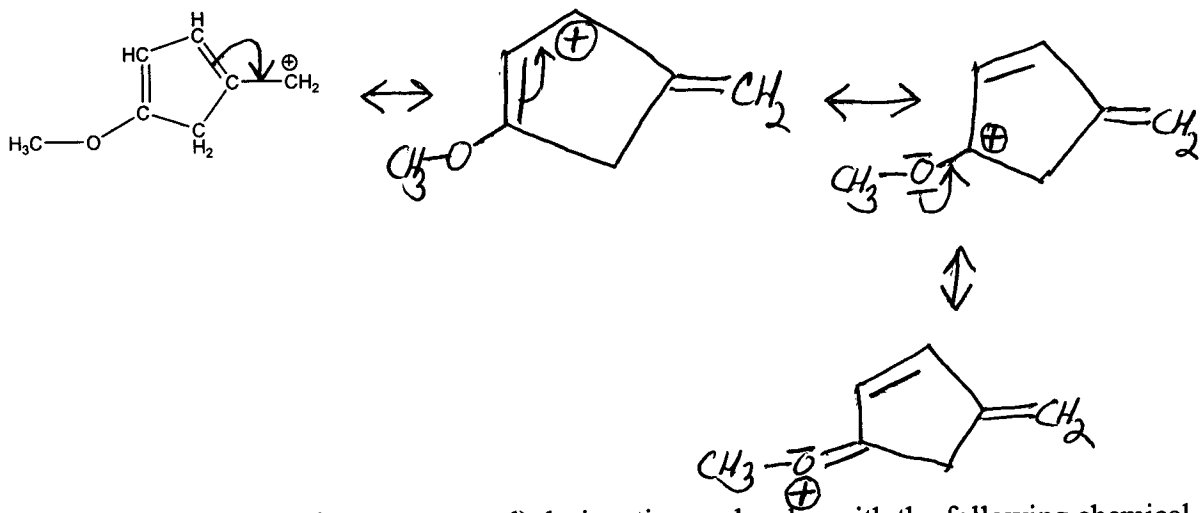
19. Draw Newman projections for the most stable and the least stable conformers for rotation about the C_3-C_4 bond of **hexane**. Label each conformer as most or least stable and as staggered or eclipsed.



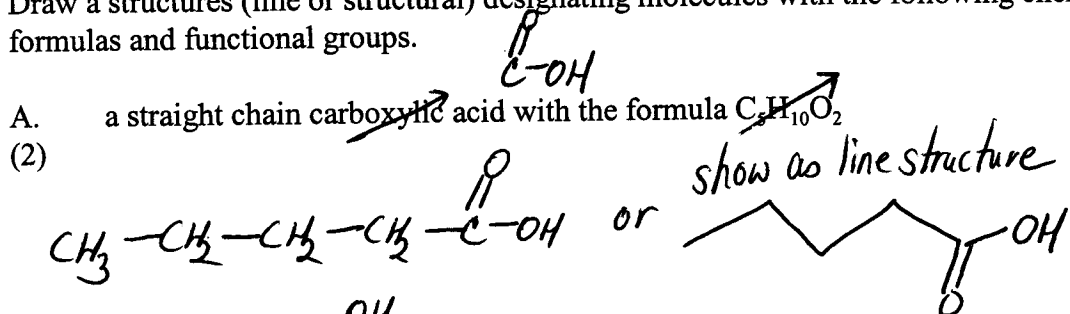
20. Using the templates given below, draw both chair conformations for *cis*-1-*t*-butyl-4-ethylcyclohexane and *trans*-1,2-diethylcyclohexane. For each, circle the more stable conformation. Bonds must be pointing in the correct direction for full credit.



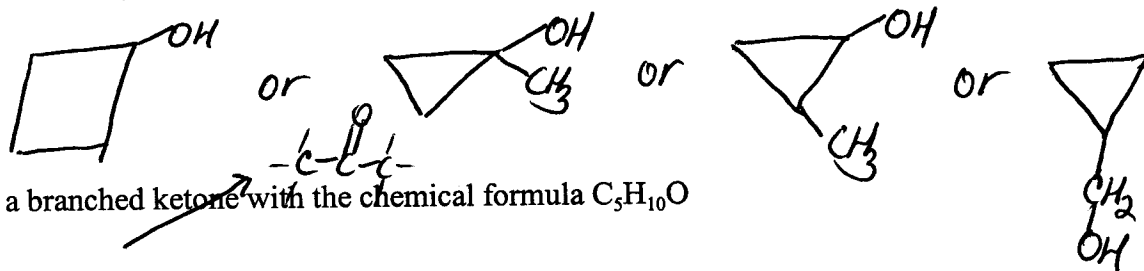
21. Draw all possible resonance structures for the cation shown below.
 (6)



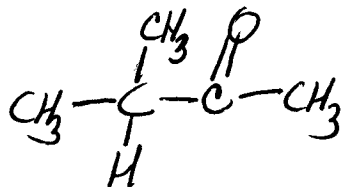
22. Draw a structures (line or structural) designating molecules with the following chemical formulas and functional groups.
 (6)



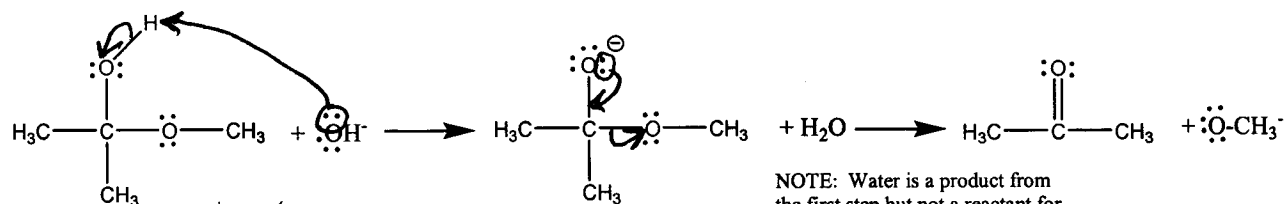
- B. a cyclic alcohol with the chemical formula C_4H_8O
 (2)



- C. a branched ketone with the chemical formula $C_5H_{10}O$
 (2)



23. Consider the polar reaction sequence shown below. For each step, DRAW curved arrows to represent the flow of electrons. In the first step identify which reactant acts as the electrophile and through which atom.



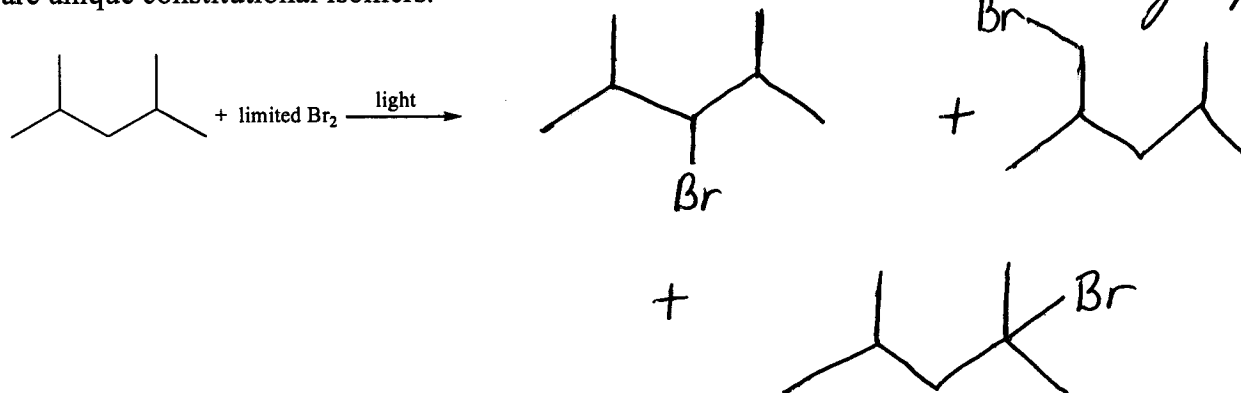
NOTE: Water is a product from the first step but not a reactant for the second step.

Electrophile through H-atom

What type of reaction is this? (substitution, addition, elimination, or rearrangement)

Elimination (H⁺ + OCH₃ or HOCH₃ is eliminated from original)

24. For the reaction shown below, give structures for all possible monobromination products that are unique constitutional isomers.



25. Draw structures (line or structural) for five different constitutional isomers of C₄H₈.

(5)

