



1. Draw the structure of the following compounds (12 pts).

A) (*E*)-3-methyl-2-pentene

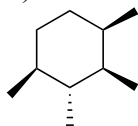
B) (*Z*)-4-methyl-1,3-hexadiene

C) (1*S*, 2*R*)-1-isopropyl-2-methylcyclohexane

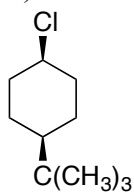
D) (2*R*,3*R*)-2,3-dibromopentane

2. Draw the most stable conformation of each of the following compounds (6 pts).

A)

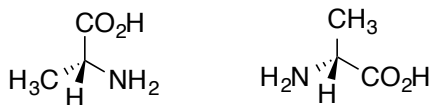


B)

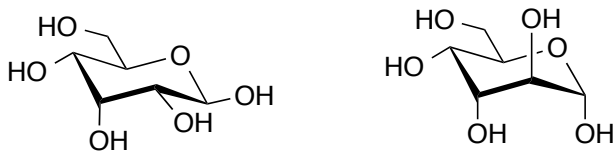


3. Describe the relationship between the two structures in each of the pairs (16 pts).

A)



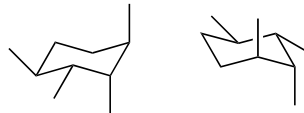
B)



C)

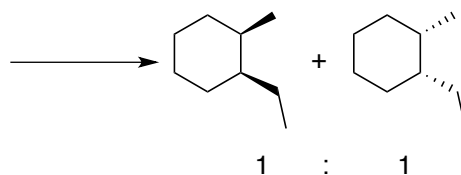


D)

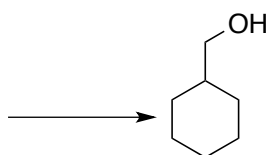


4. Complete each of the following synthesis using an alkene as a starting material (12 pts).

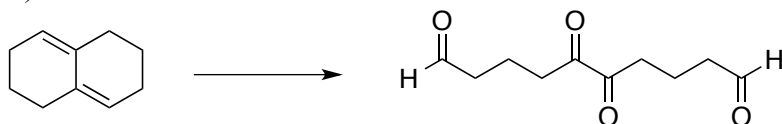
A)



B)

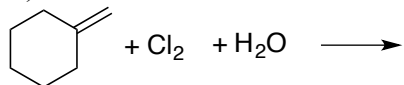


C)

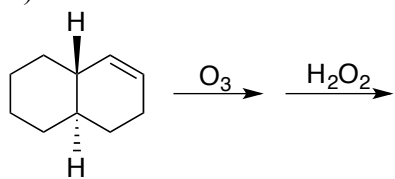


5. Give the structure and stereochemistry of the product(s) expected in each of the following reaction. Give the absolute configuration (R or S) of each chiral center in the product(s) (30 pts).

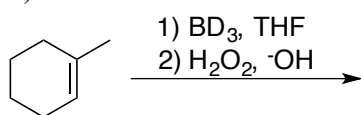
A)



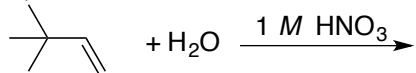
B)



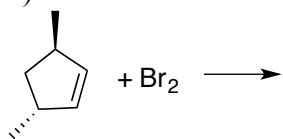
C)



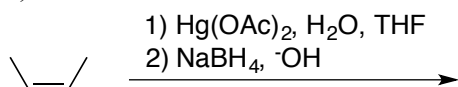
D)



E)

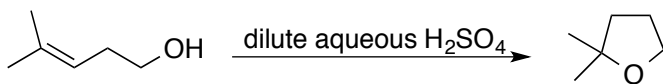


F)

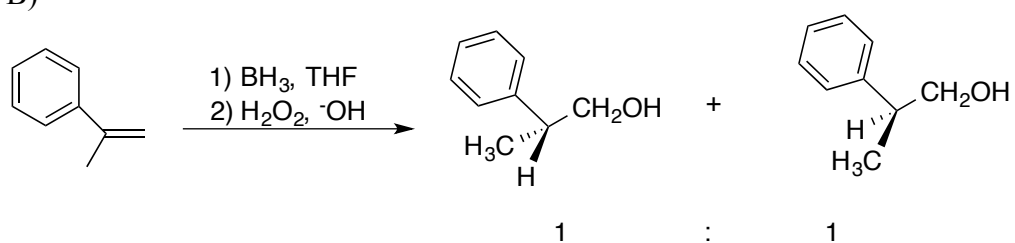


6. Provide the mechanisms for the following reactions. Show every intermediate and all the arrows required for each step of the reaction (24 pts).

A)



B)



C)

