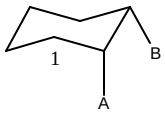
IIT Bombay
Department of Chemistry
CH102 Organic Spring 2006
Tutorial 2

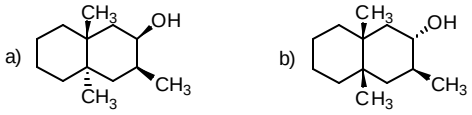
Q1. Given the following partial structure, add a substituent X to C-1 so that it satisfies the indicated stereochemical requirements



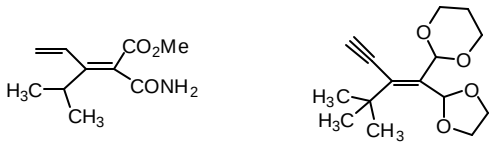
a) Anti to A b) Gauche to A c) Trans to B d) Cis to B

Q2. Sketch an approximate potential energy diagram for rotation about C-C bond in 2,2-dimethylpropane.

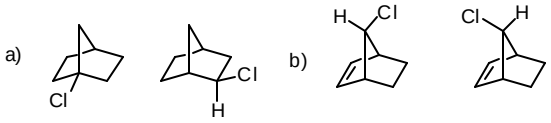
Q3. Draw the most stable conformation for the following two compounds.



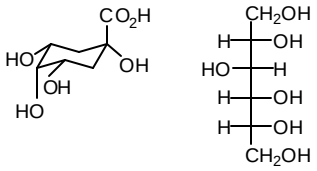
Q4. Assign E, Z configuration for the following geometrical isomers.



Q5. Assign the following pairs of compounds as constitutional isomers, diastereomers, enantiomers or identical.

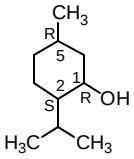


Q6. A certain natural product having $[\alpha]_D$ + 40.3° was isolated. Two structures have been independently proposed for this compound. Which one do you think is more likely to be correct? Why?

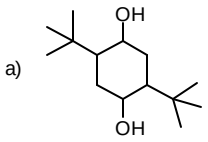


Q7.

2-Isopropyl 5-methylcyclohexanol (menthol) is used to flavour various foods and tobacco. Draw the conformational structure of menthol with the configuration as indicated.

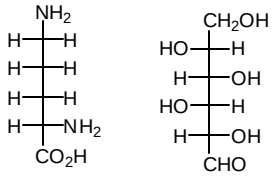


Q8. Draw the preferred conformations of the following compounds.

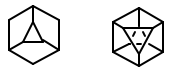


b) $HOCH_2CH_2OH$

Q9. Assign the relative configuration (D or L) of the following compounds.



Q10.* Draw the conformational structures of the following compounds (Hint: the trivial names of the compounds are indicative of the nature of bonding between cyclopropane ring(s) and cyclohexane ring).



triaxane peraxane

Q11.* How many cyclohexanes need to be joined in forming the hydrocarbon adamantane ($C_{10}H_{16}$)? What is the nature of ring fusion in this molecule and what is the conformation of each cyclohexane? Compare the structure with that of diamond?