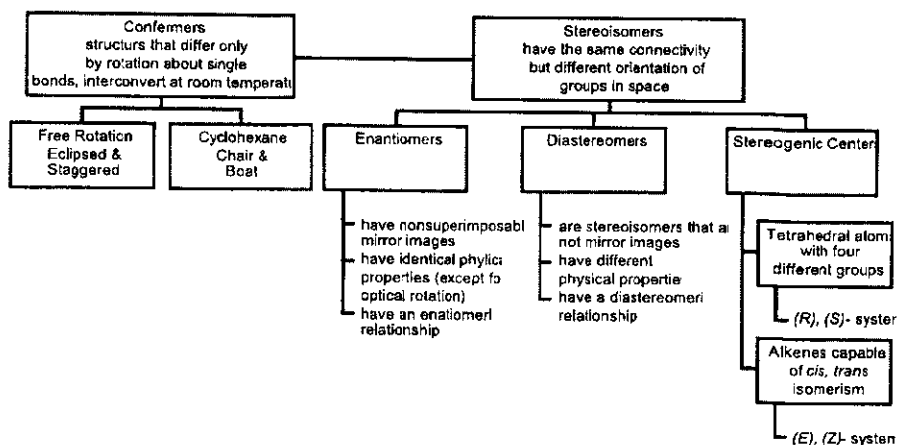
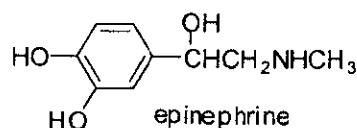
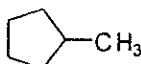
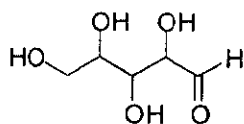
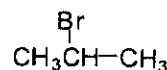
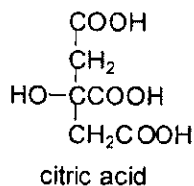
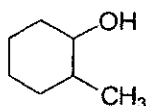
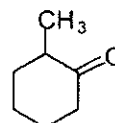
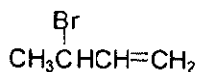
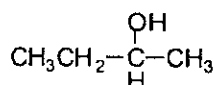


STEREOCHEMISTRY AND MOLECULAR MODELS



- 1) Circle the chiral carbons in the following compounds, if any. Using the 2^n rule, indicate the maximum number of optical isomers possible for the compounds.

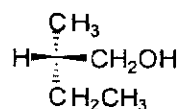
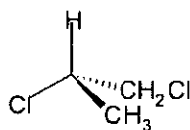
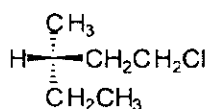
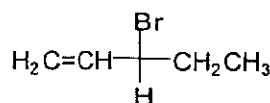
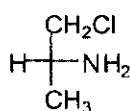
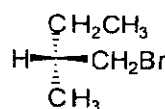
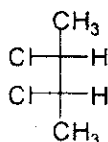
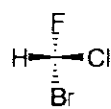


2) Assign the Cahn-Ingold-Prelog priorities to these groups of substituents -- label each group from 'A' (highest) to 'D' (lowest).

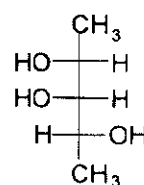
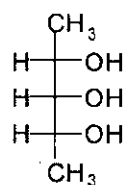
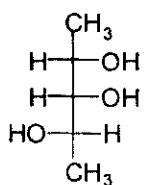
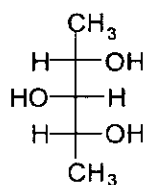
- | | | | |
|----------|----------------------------------|------------------------------------|-------------------------------------|
| a) -H | -Br | -CH ₂ CH ₃ | -CH ₂ CH ₂ OH |
| b) -COOH | -COOCH ₃ | -CH ₂ OH | -OH |
| c) -C≡N | -CH ₂ NH ₂ | -CH ₂ NHCH ₃ | -NH ₃ |
| d) -Br | -CH ₂ Br | -Cl | -CH ₂ Cl |



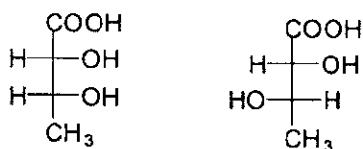
3) **Build models** and assign the correct *R* or *S* designation to each of the following structures.



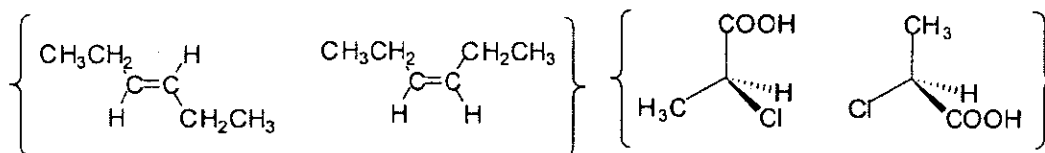
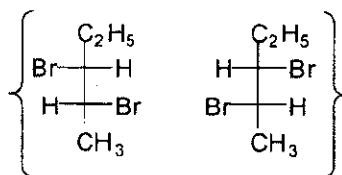
4) Circle the two stereoisomers that are mirror images and label any of the isomers that are *meso*.



5) What type of stereo isomers are the following pair?

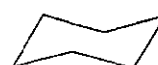
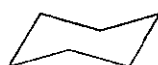
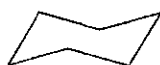


6) For each case, decide whether the following pairs are enantiomers, diastereomers, or if they are identical.



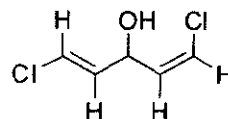
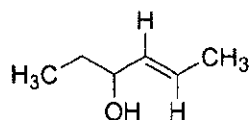
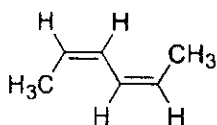
7) **Draw the structure** of 1,2-dimethylcyclohexane in the chair form, identifying each as *cis* or *trans*:

- with both methyl groups in the equatorial position
- with both methyl groups in the axial position
- with one methyl group in the equatorial and one in the axial position



8) **Build a model** of the chair form of 1,2-dimethylcyclohexane that would be the most energetically stable and show it to your instructor.

9) Assign the *cis/trans* designation to each alkene bond, and complete it's IUPAC name.



2-____-hexene-3-ol

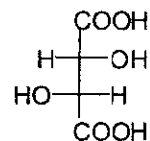
2-____, 4-____-hexadiene

1,5-dichloro-1-____, 4-____-pentadiene-3-ol

10) Determine the concentration (in g/mL) of a tartaric acid solution in a 2-dm tube, if it's optical rotation is measured to be 1.8° .

Tartaric Acid -- $[\alpha]_D = +0.6^\circ$

Show your calculation.



L-(+)-tartaric acid
2*R*,3*R*-dihydroxy-Butanedioic acid