CHEMISTRY 59-230/232

First Test

Time 50 min

October 1991

NAME: _____

ID #: _____

1. Give a structure which corresponds to the following IUPAC names. Make sure your drawings show all required stereochemistry. [16 points]

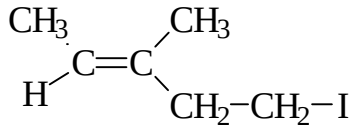
(a) Z 2,4-dichloro-3-methyl-2-pentene

(b) cis 3,4-dimethylcyclohexene

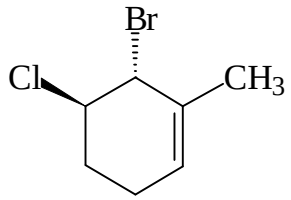
(c) 3-bromo-7-chloro-1-octyne

2. Give an acceptable IUPAC name (including E or Z stereochemical descriptors) for the following structures.

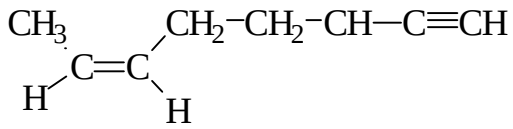
(a)



(b)



(c)



3.(a) Draw the perspective drawing (NOT the Newman projection) of the less stable configuration of 1-isopropyl-2-methylcyclohexane in its less stable chair conformation. Label the substituents as being axial (a) or equatorial (e). [10 points]

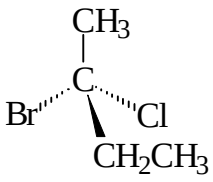
(b) Draw the NEWMAN PROJECTION of each of the following molecules. [12 points]

(i) The conformation of 1-methylcyclohexane which has the most synclinal interactions.

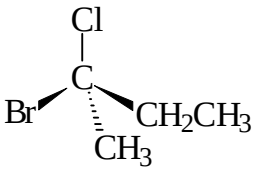
(ii) 2-methylbutane in its least stable staggered conformation around the C2-C3 bond

4 (a) Choose the term from the following list (enantiomers, diastereomers, identical, positional isomers) which correctly describes the relationship between the pairs of drawing shown below. [16 points]

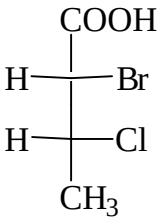
(i)



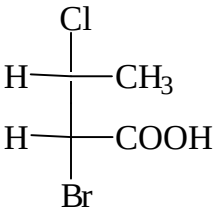
and



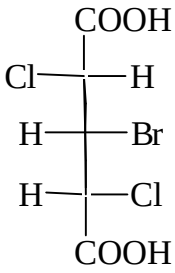
(ii)



and



(iii)



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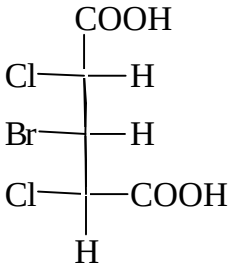
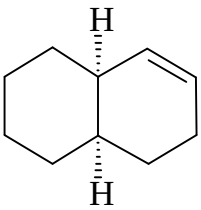
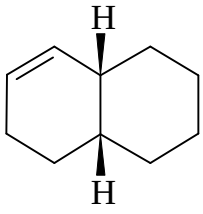


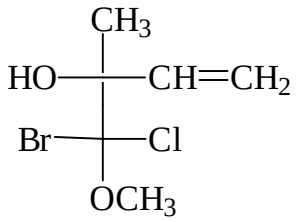
(iv)



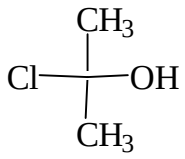
and

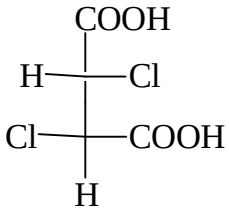


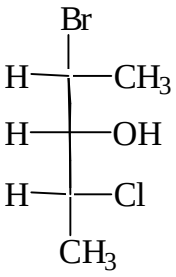
(b) Assign the stereochemical dsescriptors [R or S] to each of the chiral centres in the molecule shown below. [6 points]

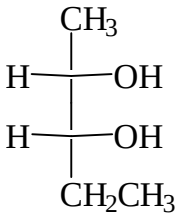


(c) If any of the molecules shown below are meso forms, circle them

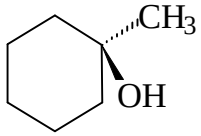


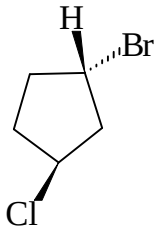


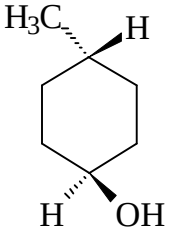


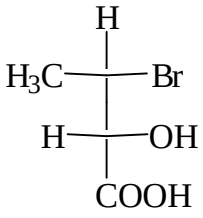


(d) Circle those structures in the following list which would NOT affect a beam of polarized light. [6 points]



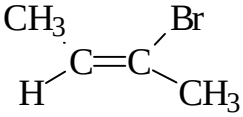






5. Indicate whether each of the following statements is TRUE [T] or FALSE [F]. Note that for a statement to be true, all parts of it must be true.

a) the following structure is the Z isomer [ ]



b) A synclinal conformation is always of lower energy that an anticlinal one [ ]

c) In a molecule with the molecular formula $C_{17}H_{22}O_4$ the index of hydrogen deficiency is EIGHT. [ ]

d) There are 6 set of equivalent hydrogens in 3-chloro-2,4-dimethylhexane [ ]

f) E 3-methyl-2-pentene is optically active. [ ]