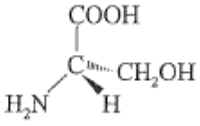
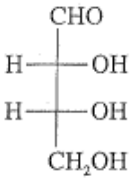
**Stereochemistry** **Name:** _____

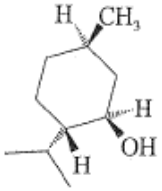
1. The following structures are naturally occurring optically active compounds. Star (*) the asymmetric/chiral carbon atoms in these structures.



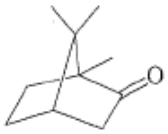
serine



erythrose

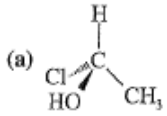


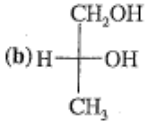
menthol

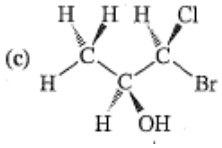


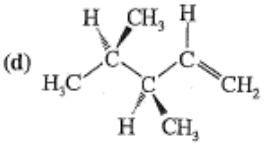
camphor

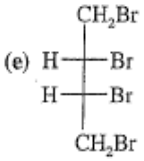
2. For each structure
   a) Star (*) any asymmetric/chiral carbon atoms.
   b) Label each chiral carbon as R or S.
   c) Draw any internal plane of symmetry.
   d) Label the structure as chiral or achiral
   e) Label any meso structure.

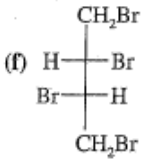


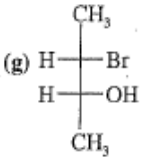



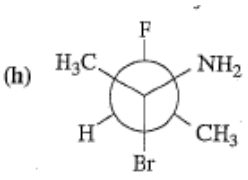



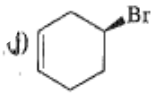



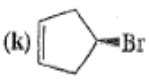



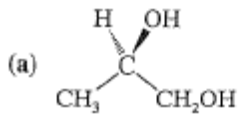



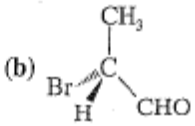



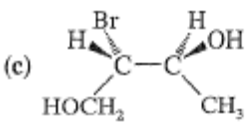



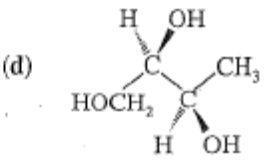




4. Convert the following perspective forumulas to Fischer projections.

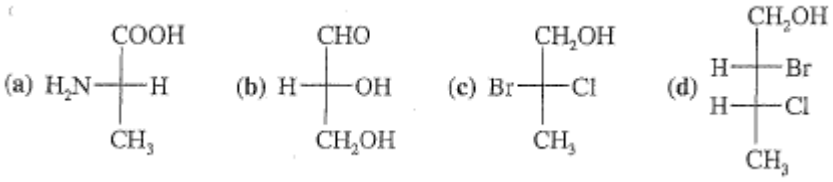


5. Convert the following Fischer projections to perspective formulas.




6. For each of the following compounds:
   a) Draw a three dimensional representation.
   b) Star (*) each chiral center.
   c) Draw any plane of symmetry.
   d) Draw any enantiomer.
   e) Draw any diastereomer.
   f) Label each structure as chiral or achiral.

(S)-2-chlorobutane

(R)-1,1,2-trimethylcyclohexane

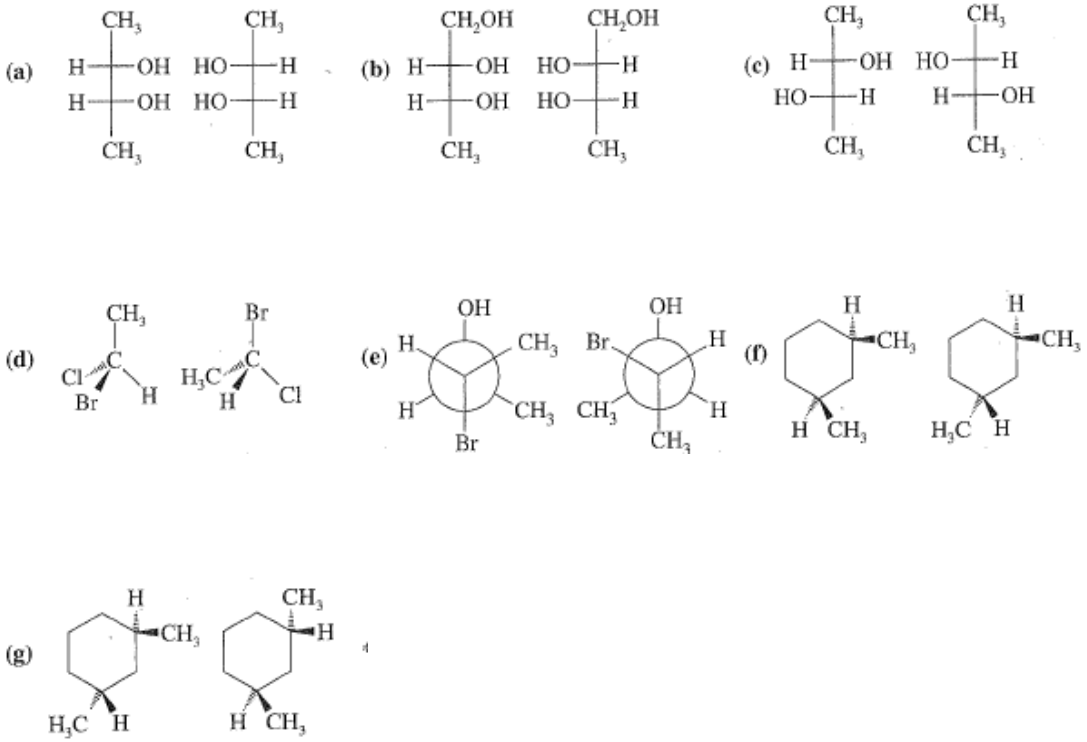
(2R, 3S)-2,3-dibromohexane

(1R, 2R)-1,2-dibromocyclohexane

Meso-hexane-3,4-diol ($CH_3CH_2CHOHCHOHCH_2CH_3$)

(+/-)-hexane-3,4-diol

7. Give the stereochemical relationships between each pair of structures e.g. same compounds, constitutional isomers, enantiomers etc.



8. Draw the enantiomer, if any, for each structure.