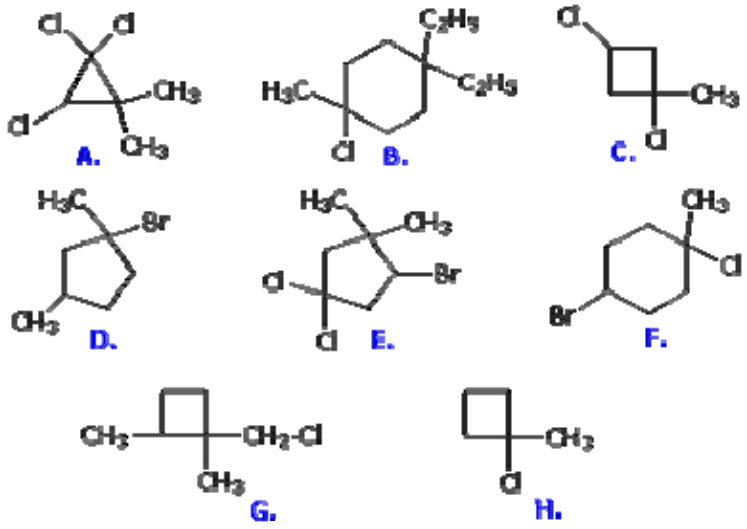
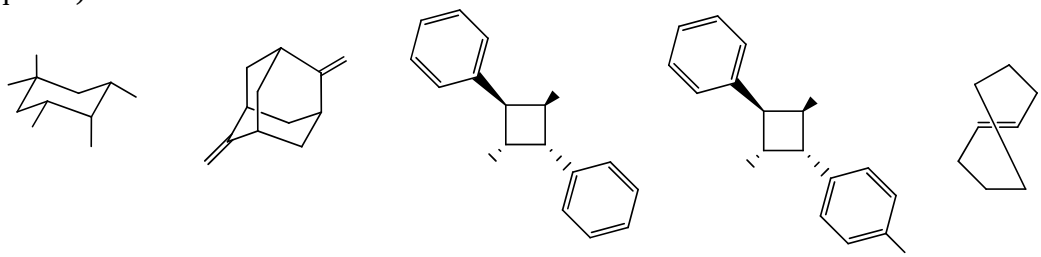
Organic tutorial-1

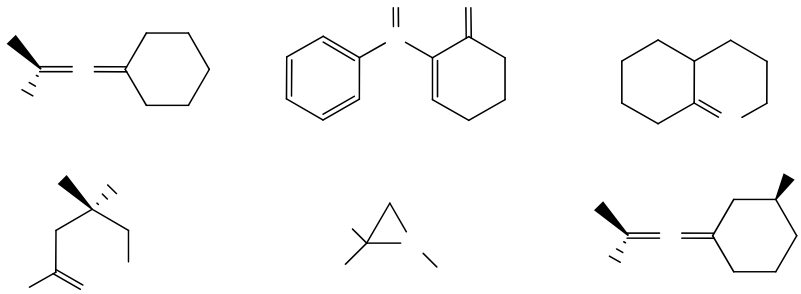
1. Among the eight compounds (**A** through **H**) drawn below, identify those that would exist as a pair of stereoisomers (enantiomers and diastereomers).



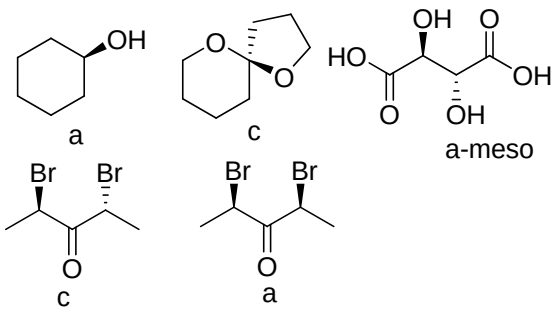
2. Which of the following molecules are chiral, achiral or meso (No explanation is required)?



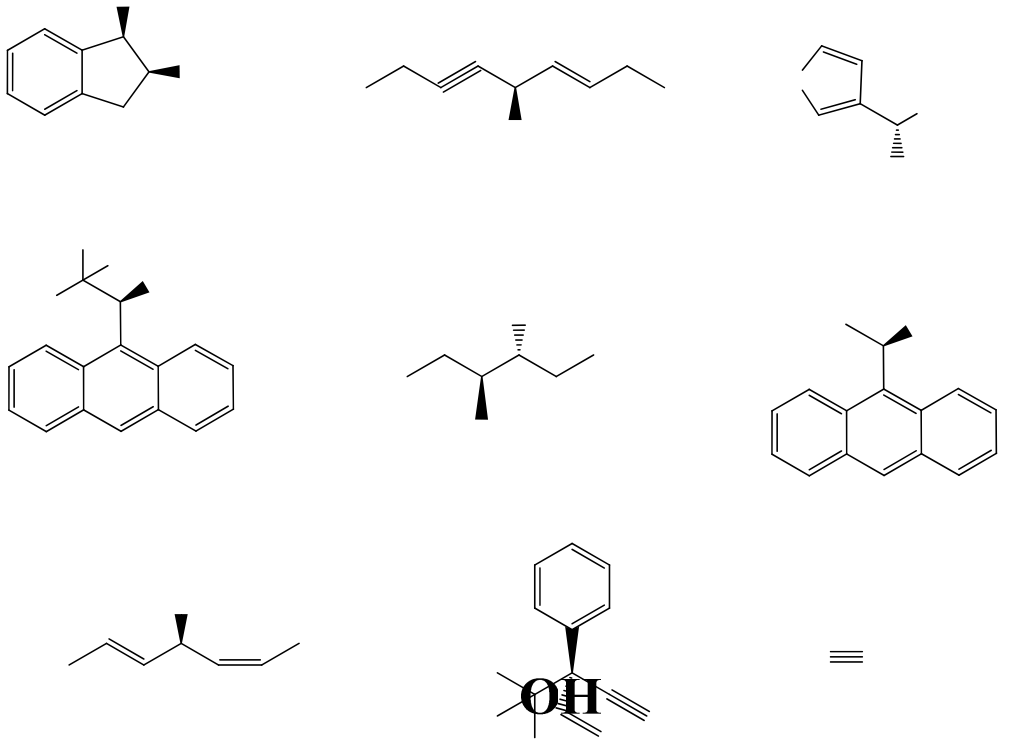
3. State with explanations whether the following molecules are chiral or achiral?



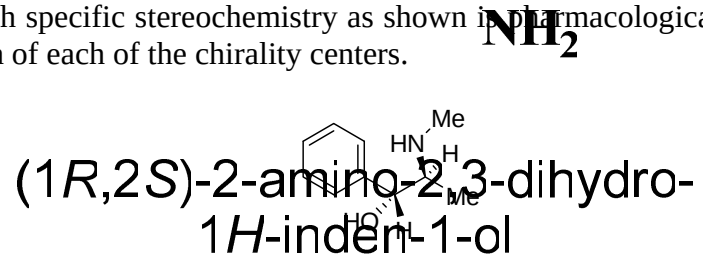
4. For each of the following structures, determine whether it is chiral or not? Explanation is always welcome.



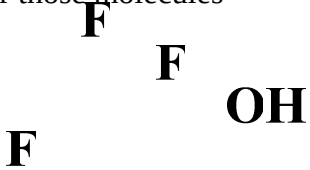
5. Assign absolute configuration for each of these following molecules;

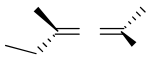


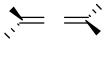
6. The compound with specific stereochemistry as shown is pharmacologically active. What is the configuration of each of the chirality centers.

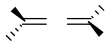


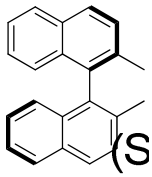
7. Assign absolute configuration for those molecules



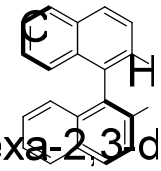


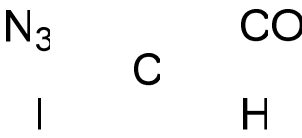






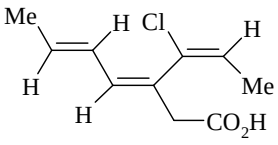
(S)-4-methylhexa-2,3-diene



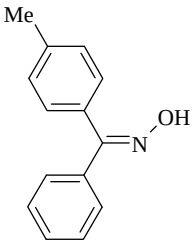


(S)-4-azido-4-iodobut

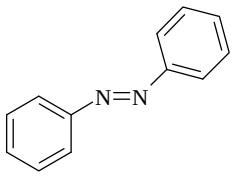
8. Predict the double bond geometry (*E*, *Z*) in the following compounds,



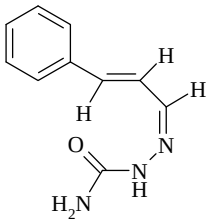
3(E)-1-chloropropenyl-(3Z, 5E)-3,5-heptadienoic acid



Z



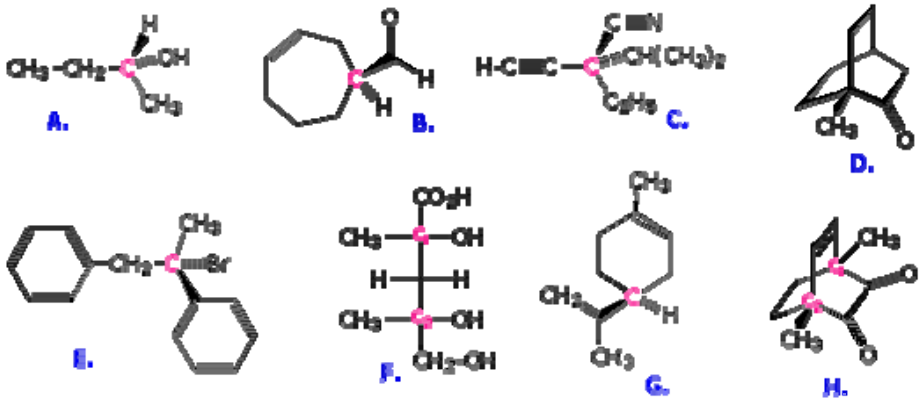
E



(Z)-[(E)-2-pentenal semicarbazone]

(*R*)-2,2'-dimethyl-1,1'-binaphthyl

8. The configurations of eight compounds **A** through **H** are shown below, using various kinds of stereo-representations. To answer the four questions posed below, enter letters (**A** through **H**) indicating your choice(s) in the designated answer box. If no structure satisfies the conditions of the question enter an **X**.



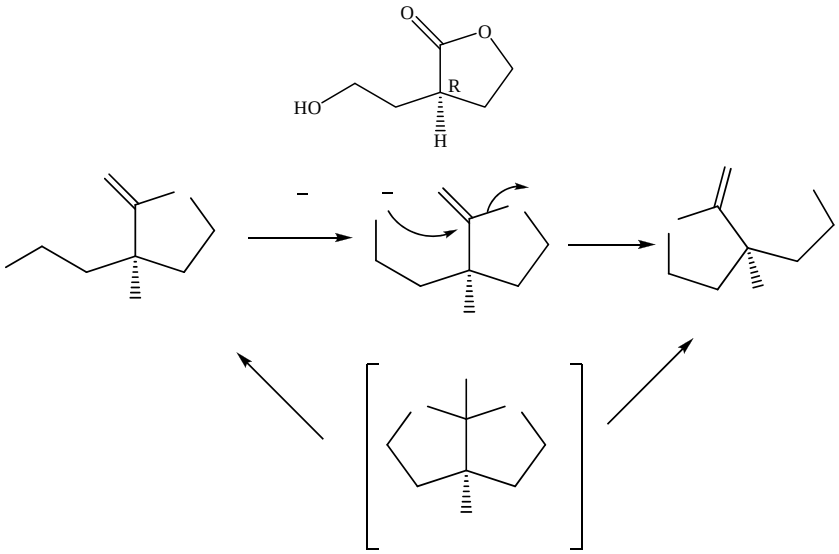
1. Which if any of these configurations are achiral? ..... D, H

2. Which if any of these configurations has no stereogenic center? .... D

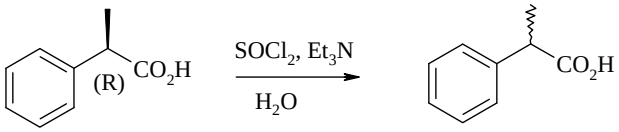
3. Which if any of these configurations has more than one stereogenic center? .. F, H

4. Which if any of these configurations are meso compounds? ..... H

8. Following compound racemises in the presence of base. Explain.

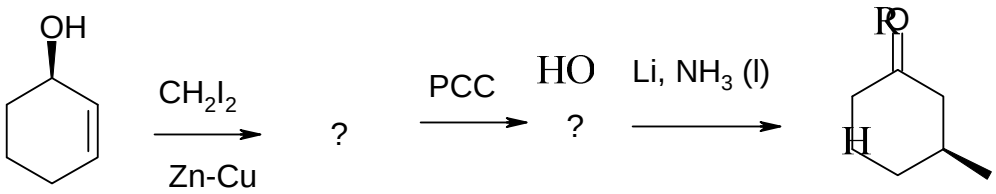


9. In the following reaction predict the final stereochemistry of the product acid?



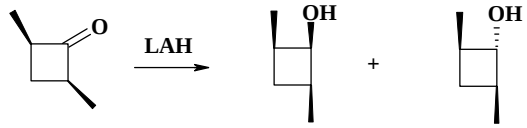
Hint: Formation of ketene followed by nucleophilic attack of water lead to racemisation.

10. Predict the absolute configuration of the SM and pdt in the following reaction, also identify the intermediates.

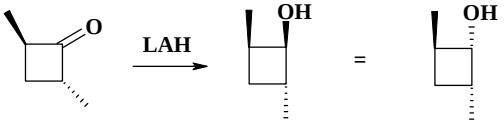


11. Cis-2,4-dimethylcyclobutanone on reduction with LAH ($LiAlH_4$) yielded two alcohols, where as the trans- isomer yield exclusively one alcohol. Predict the structure of the product alcohols and comment on their chirality?

Hint:



Both are achiral (meso)



chiral