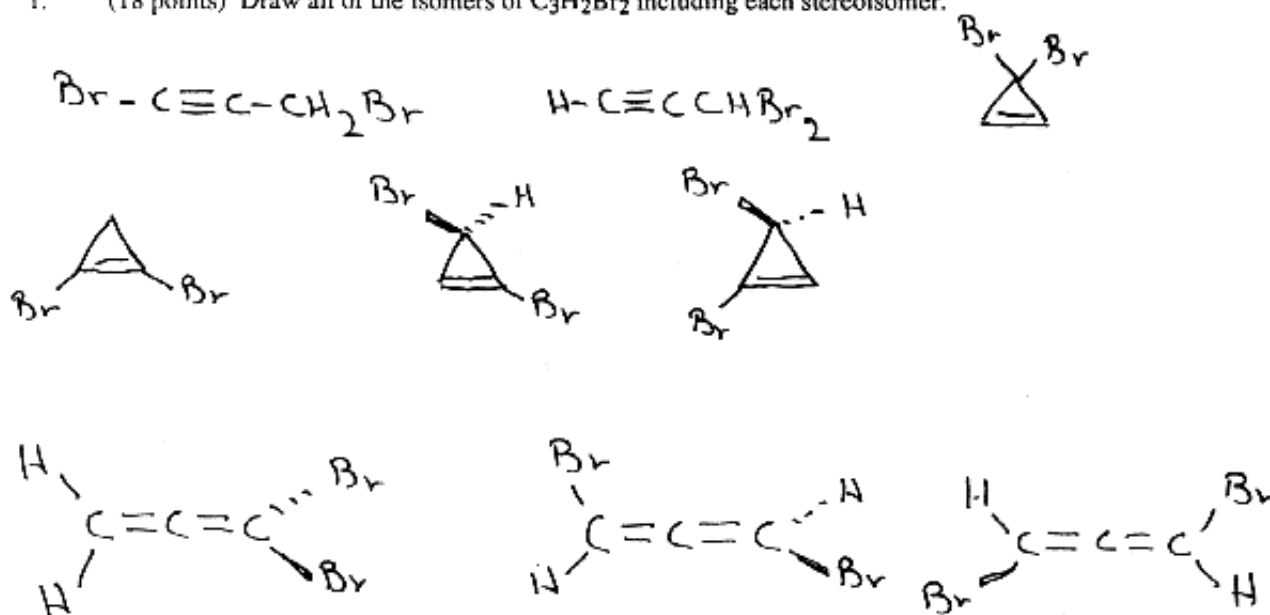


Molander - Key to 1st Exam

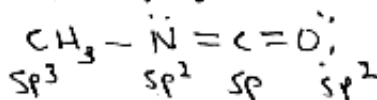
NAME _____

1. (18 points) Draw all of the isomers of $C_3H_2Br_2$ including each stereoisomer.

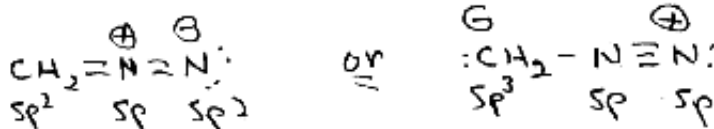


2. (18 points) Draw the best Lewis dot structure for the following compounds. You may use a line for each bonding pair of electrons, but make certain to include lone pairs and any formal charges. Indicate the orbital hybridization on each of the non-hydrogen atoms.

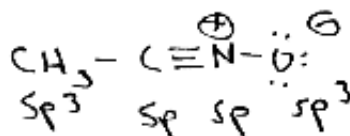
a. CH_3NCO



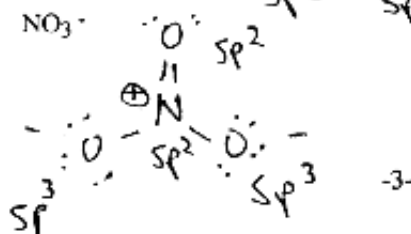
b. CH_2N_2



c. CH_3CNO

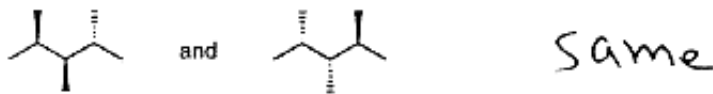


d. NO_3^-

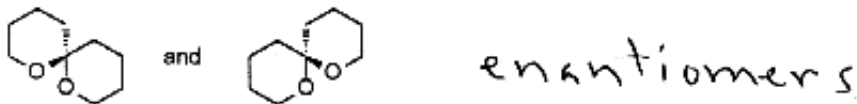


3. (12 points) For each of the following pairs of compounds, indicate whether they are structural isomers, diastereomers, enantiomers, the same compound, or none of the above.

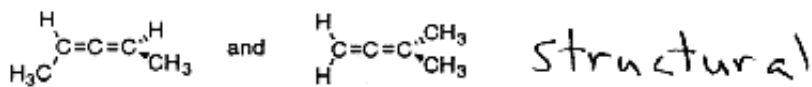
a.



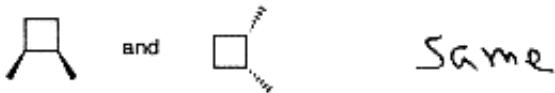
b.



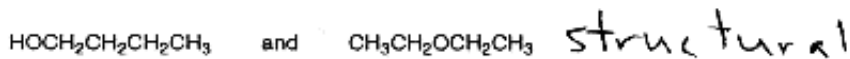
c.



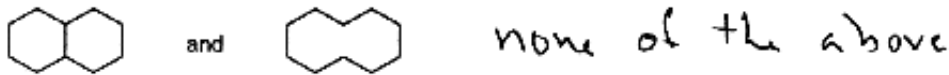
d.



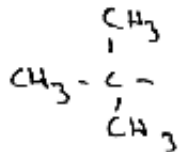
e.



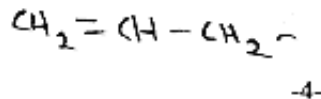
f.



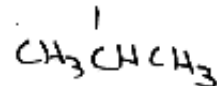
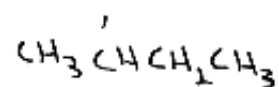
4. (12 points) Draw the following groups.

a. Ethyl group CH_3CH_2- b. *tert*-Butyl group

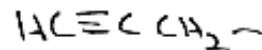
c. Allyl group



d. Isopropyl group

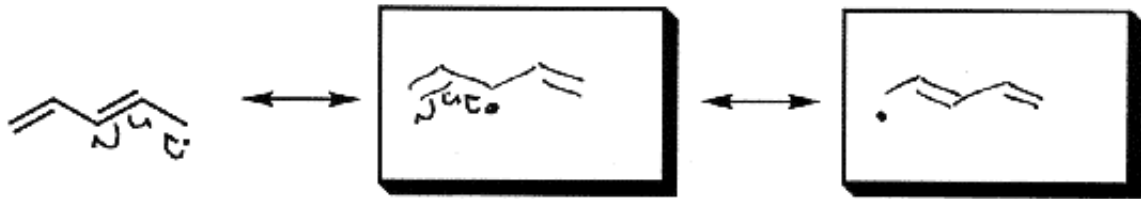
e. *sec*-Butyl group

f. Propargyl group

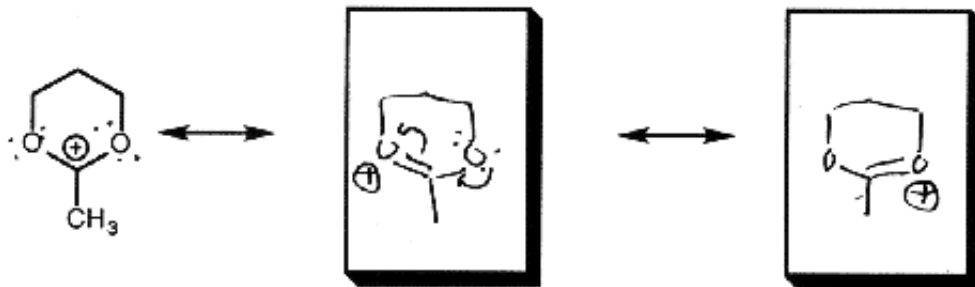


5. (14 points) Draw the other most stable resonance structures for the following species.

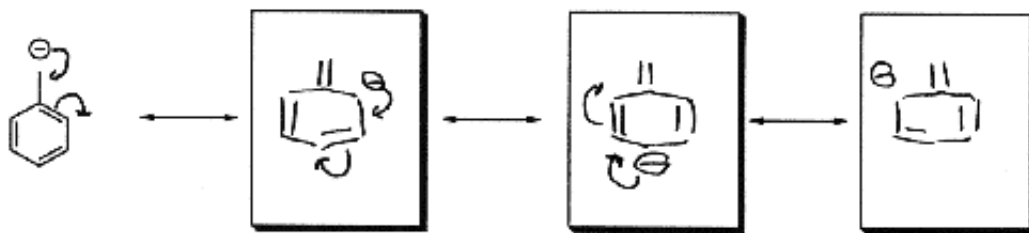
a.



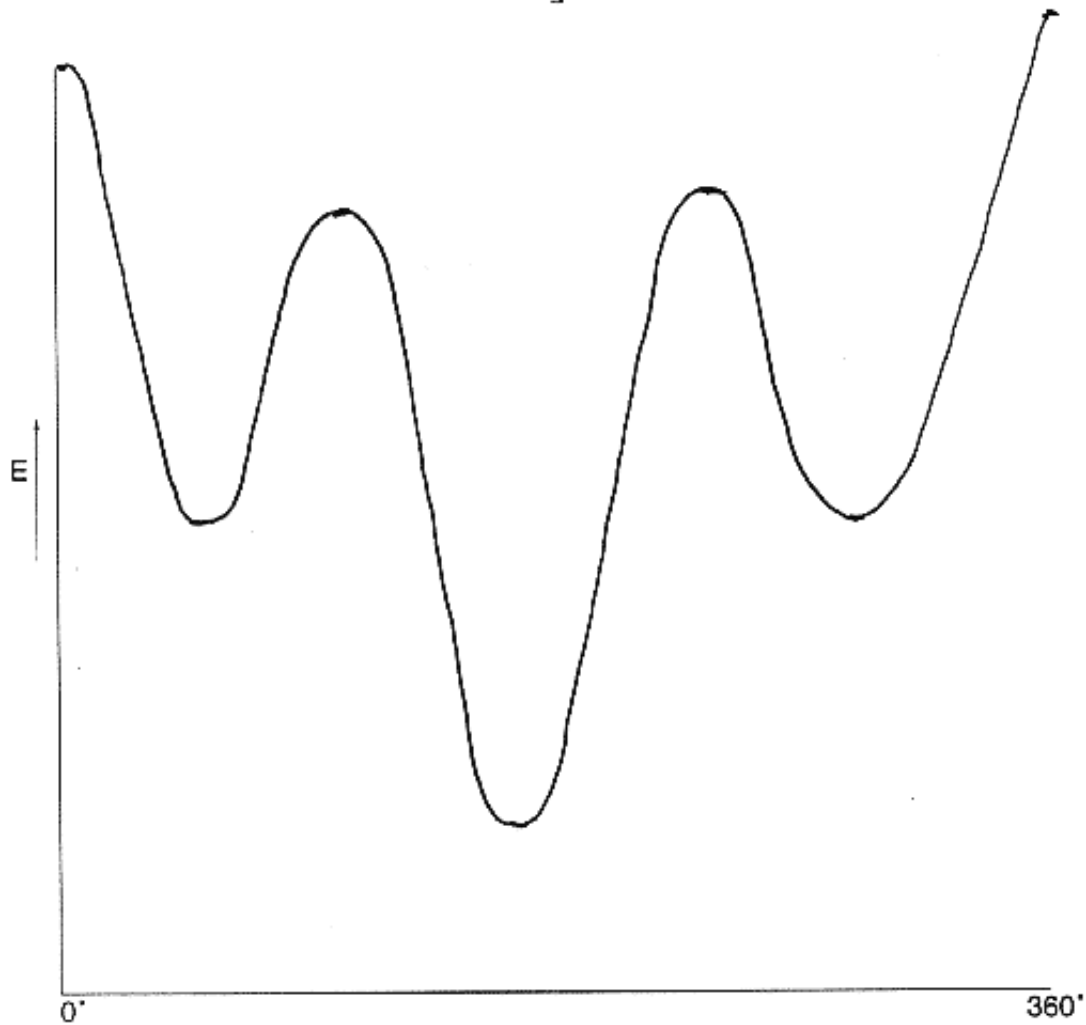
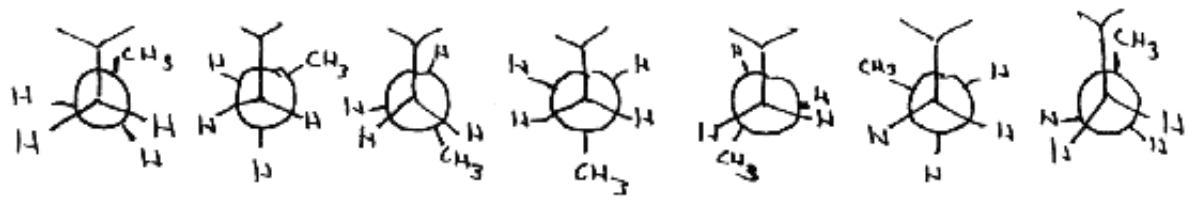
b.



c.

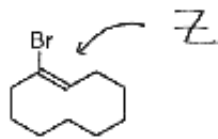


6. (14 points) Consider 2-methylpentane. Draw the Newman projections for each 60° conformation between 0° and 360° and sketch an approximate potential energy diagram for rotations about the 3,4-carbon-carbon bond in this molecule. Make the highest energy conformation the 0° conformation.

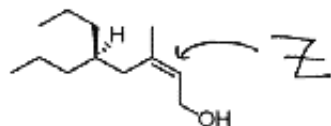


7. (12 points) Label each stereocenter in the following structures using the Cahn-Ingold-Prelog system. Label each stereocenter (R) or (S) and each double bond (E) or (Z).

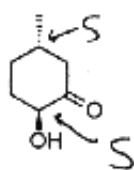
a.



b.



c.



d.

