

NAME (Print): _____

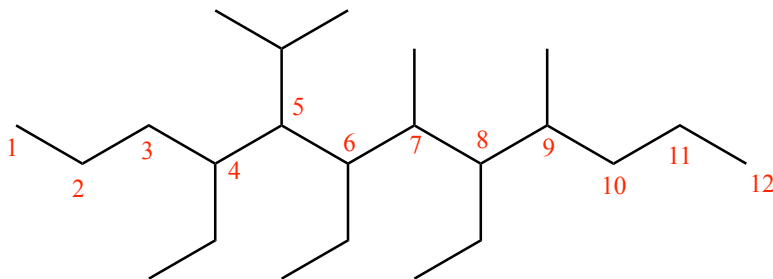
SIGNATURE: _____

Chemistry 320M/328M
Dr. Brent Iverson
3rd Homework
September 10, 2025

**Please print the
first three letters
of your last name
in the three boxes**

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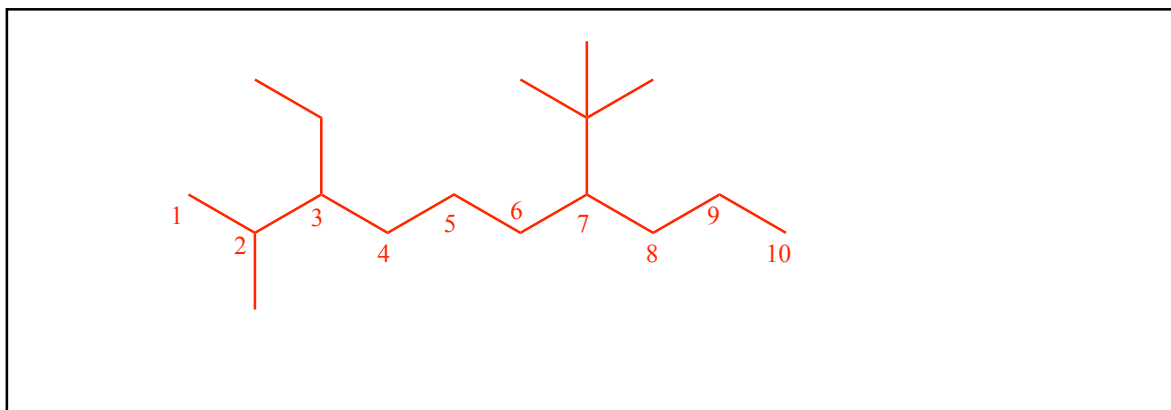
1) (3 pt) One last nomenclature question for you! This is a complicated one! On the line provided, write the IUPAC name of the following molecule.



4,6,8-triethyl-5-isopropyl-7,9-dimethyldodecane
4,6,8-triethyl-7,9-dimethyl-5-(1-methylethyl)dodecane

2) (3 pt) In the box provided, make a line-angle drawing of the following molecule:

3-Ethyl-2-methyl-7-(1,1-dimethylethyl)decane



3. (2 pts each) Fill in each blank with the word or words that best completes the sentences.

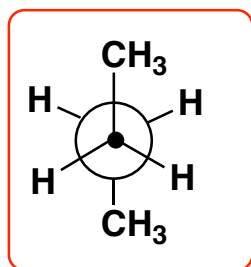
For organic chemistry, it is best to think of electrons as waves.

According to the valence bond approach, the atomic orbitals on each atom are

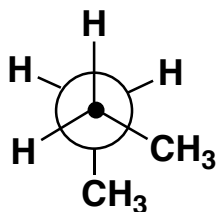
combined first to create hybridized orbitals, that overlap to create sigma bonds.

Three (or more) atom "pi-ways" are the situation resonance contributing structures are usually trying to describe. For pi bonding and therefore pi delocalization to occur over more than two atoms (i.e. pi-ways), parallel and overlapping 2p orbitals are needed on ALL of the adjacent atoms involved. As a result, all of the atoms involved in pi-ways are usually sp² hybridized, and NEVER sp³ hybridized.

4. (4 pts each) For each pair of molecules, circle the one that has LESS STRAIN, then put an "X" in the box under all the types of strain that explain(s) your answer:



vs.



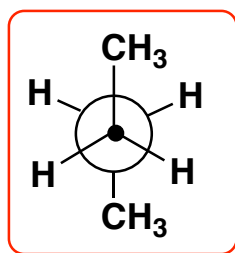
Angle
strain

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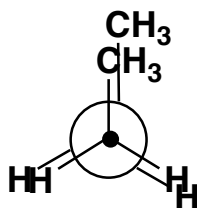
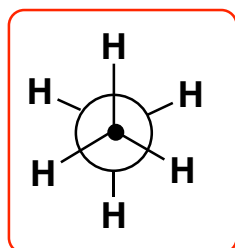
Torsional
strain

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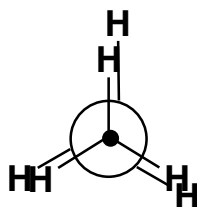
Steric
strain

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vs.

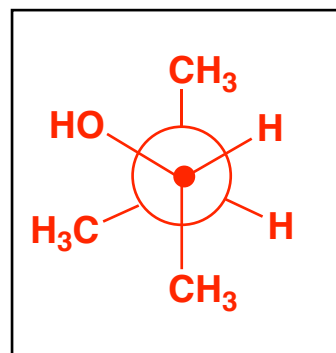
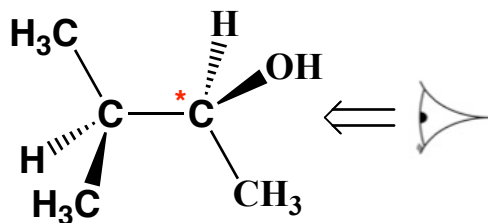
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vs.

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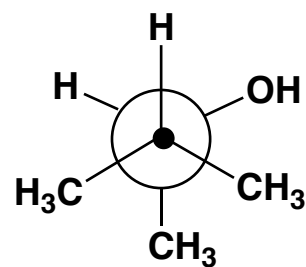
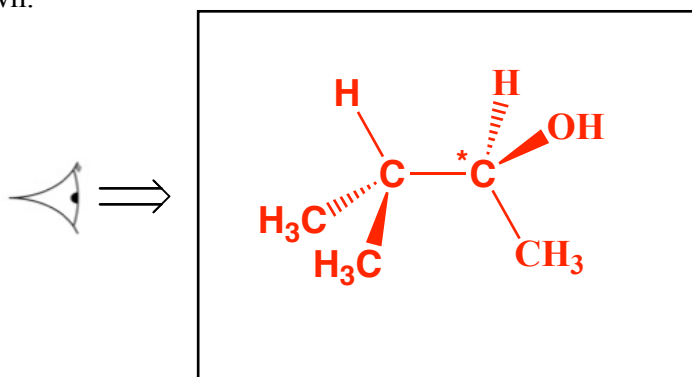
5. (5 pts) Draw the Newman projection for the conformation of 3-methyl-3-butanol as shown.

A)



(5 pts) In the empty box draw the conformation of 3-methyl-3-butanol indicated by the Newman projection shown.

B)



6. (1 pt each) In the boxes provided, write the hybridization state of the atoms indicated by the arrow.

