

Name: _____

The test is worth 106 points but scored out of 100.

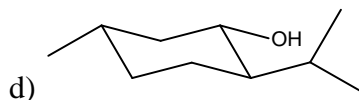
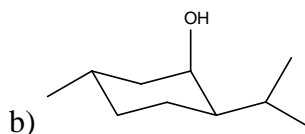
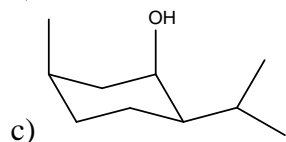
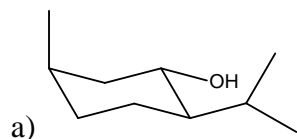
1) a) Draw a Newman projection of a conformation with a gauche interaction sighting down the C3-C4 bond of 2,2,5,5-tetramethylhexane. (3 pts.)

b) Draw a Newman projection of an eclipsed conformation that is **not** the least stable sighting down the C3-C4 bond of 2,2,5,5-tetramethylhexane. (3 pts.)

2) a) Draw a Newman projection of a staggered conformation of 2-methylbutane looking down the C2-C3 bond. (3 pts.)

b) Draw a Newman projection for the other (*has different energy level*) staggered conformation of 2-methylbutane looking down the C2-C3 bond. (3 pts.)

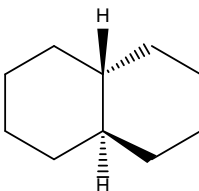
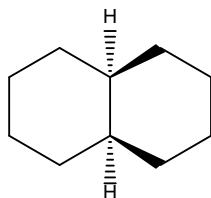
3) a) Circle the ALL R diastomer of the alcohol below. b) Put a box around the least stable diastomer of the alcohol below. (3 pts. each)



4) Draw the other chair conformation of the most stable diastereomer. (4 pts.)

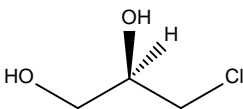
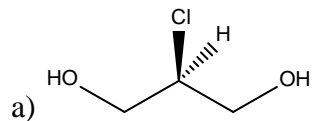
5) Draw the other chair conformation of the ALL R diastereomer. (4 pts.)

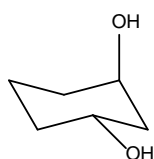
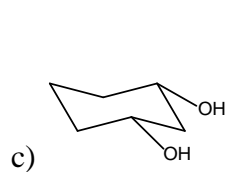
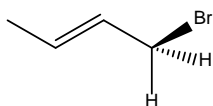
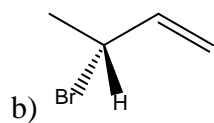
6) Decalin can exist as the cis or trans diastereomer. Both are shown below. Draw the chair conformation of either one but circle the diastereomer you drew. (4 pts.)



7) Which is more stable? Cis or trans decalin? Explain your choice. A Newman projection including the bond in both rings is required in your explanation. (4 pts.)

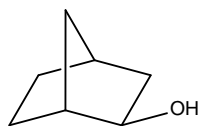
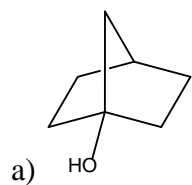
8) In each of the following pairs of compounds one is chiral and the other is achiral. Circle the Achiral molecule in each pair. Explain why it is achiral. (4 pts. each)

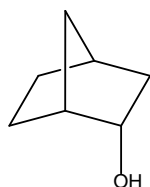
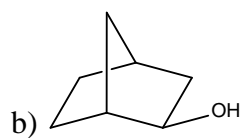


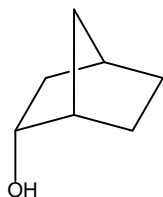
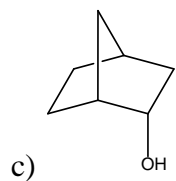


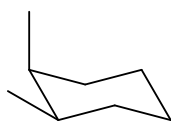
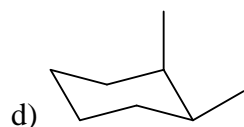
9) Assign R and S to the chiral centers in question 7. (5 pts.)

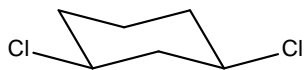
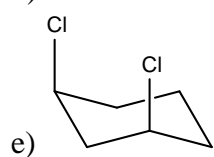
10) Describe how the following molecules are related. Options are enantiomers, diastereomers, constitutional isomers, same due to being meso, same but not meso, no relation, or conformational enantiomers (2 pts. each)



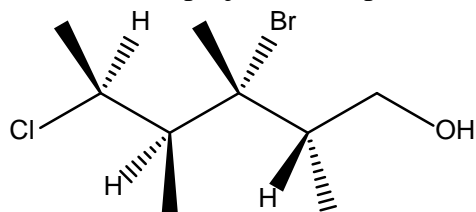








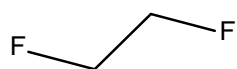
11) Convert the following molecule to a Fisher projection. The alcohol can be either the top or bottom of the projection. (4 pts.)



12) a) Name the molecule in # 11. (3 pts.)

b) Draw (1R,4S)-1,4-dichlorospiro[2.2]pentane. (3 pts.)

c) Name the following Freon as R – xxx. (3 pts.)

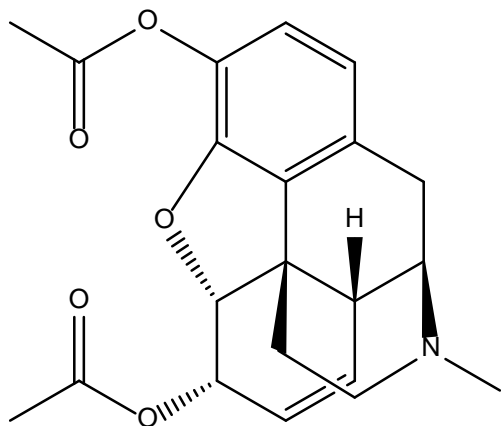


13) R(+)-limone can be isolated from oranges. R-(+)-limonene has a specific rotation of $+120^\circ$. A student has received a rotation of $+90^\circ$ on the polarimeter.

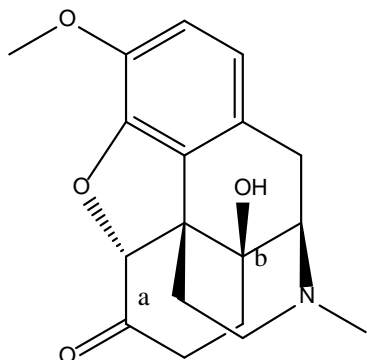
a) What is the percent e.e? (4 pts.)

b) How much S-(-)-limonene is present in the student's solution? (4 pts.)

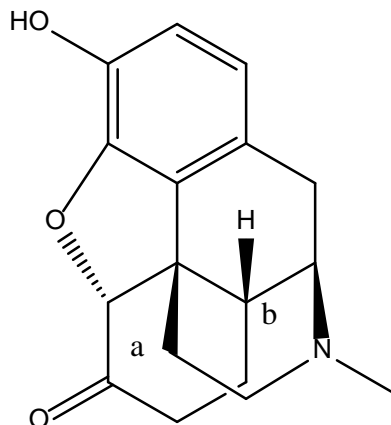
14) Indicate a chiral center with an asterisk for heroin below. (5 pts.)



15) a) Indicate if atoms a and b have been oxidized, reduced or neither for oxycontin below as compared to heroin above. (3 pts.)



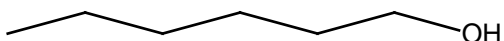
b) Indicate if atoms a and b have been oxidized, reduced or neither for dilaudid below as compared to heroin above. (3 pts.)



16) Circle the molecule in the following pairs that would have the HIGHER boiling point. Explain your choice. (3 pts. each)

a) Heptane
(Roughly the same MW)

vs.



b) Hexane

vs.

tridecane

c) n-hexane

vs.

neohexane

17) Free question: Give something you studied that was not asked on this test. (4 pts.)