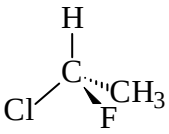
Chemistry 211 ***Name____Answer Key_____***

Test 5 (Chapters 9 & 10) ***June 15, 2001***

1. (15) Write the appropriate letter on the line beside each pair of structures to indicate their relationship as: **C**onstitutional isomers (**C**), **D**iastereomers (**D**), **E**nantiomers (**E**), **I**dentical (**I**), or **N**one of the above (**N**).



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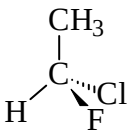
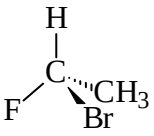


I



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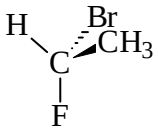
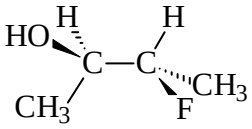


E



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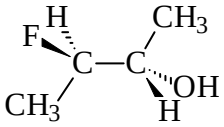

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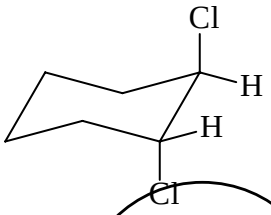

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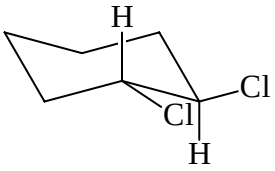

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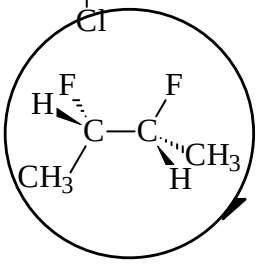

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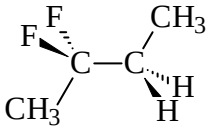


C

2. (4) Circle every **meso form** in Question 1 above.

3. (2) If a substance has three (3) stereocenters, what is the maximum number of stereoisomers of that substance theoretically possible? (a correct formula will suffice)

# of stereoisomers = 2^n = 2^3 = 8

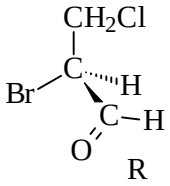
4. (4) If a new stereocenter (chirality center) is formed during a chemical reaction between achiral reactants, the product of the reaction must be either a

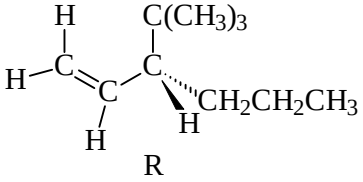
_____***meso form***_____ or a _____***racemic mixture***_____.

5. (3) The only physical property that is different between a pair of enantiomers is:

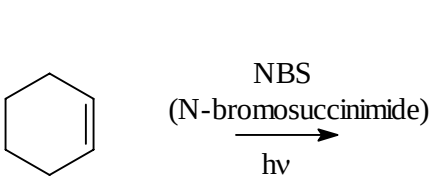
_____***the direction each rotates the plane of plane-polarized light***_____.

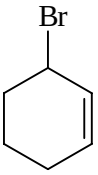
6. (4) Determine the configuration (**R** or **S**) of each stereocenter in the following structures.

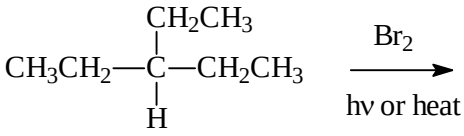


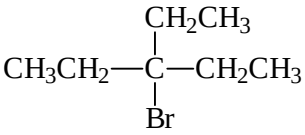


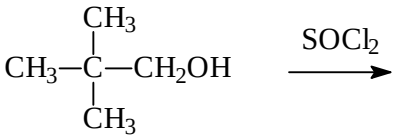
7. (15) Draw the structure of the major organic product of each of the following reactions:

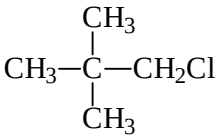


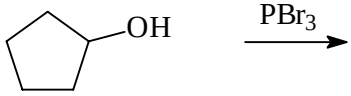


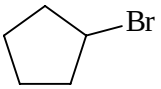


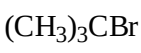












8. (3) Draw the mechanism of the reaction of addition of bromine (Br_2) to *trans*-2-butene. Show the intermediate. Be sure to indicate completely (with dashed lines and wedges) the stereochemistry of the each product that is formed. If more than one product is formed, name the stereochemical relationship between the products.