

Name: _____

CHEMISTRY 3311, Fall 1991

Professor Walba

Second Hour Exam

11/7/91

scores:

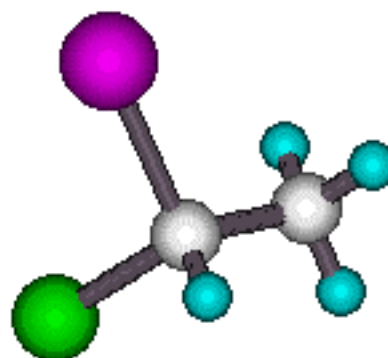
1)

2)

3)

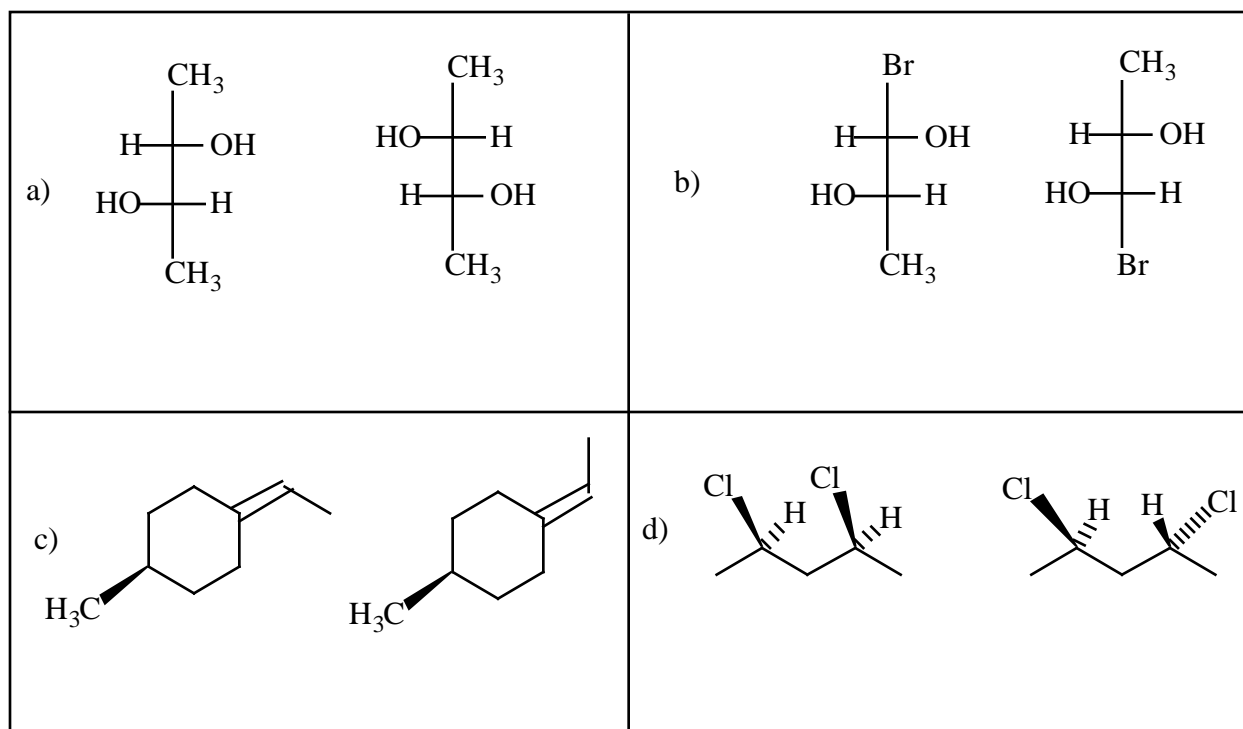
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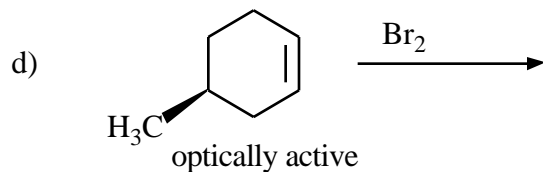
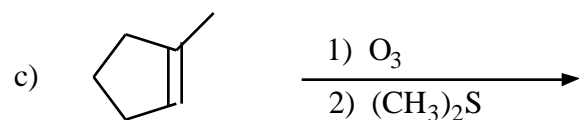
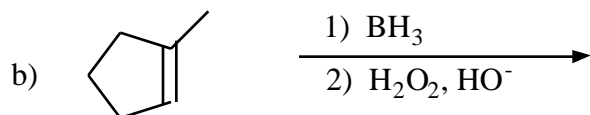
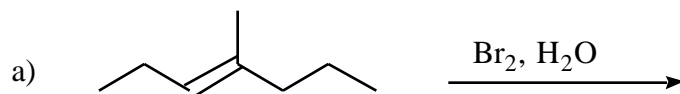
This is a closed-book "open model" exam. You may use models, but no notes or books. Please put all your answers on the test. Use the backs of the pages for scratch.

1) (12 pts) Label each of the following pairs of structures as homomers, enantiomers, diastereomers, or constitutional isomers.



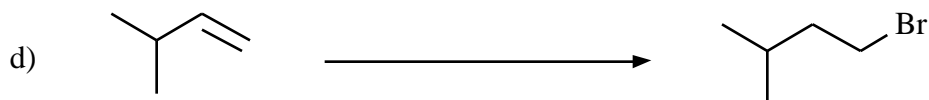
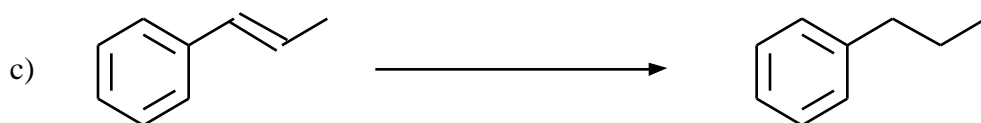
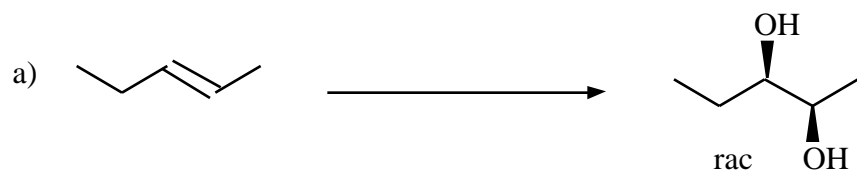
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2) (24 pts) Give the major organic product (or products if more than one major product will be formed) of each of the following reactions. Show the stereochemistry of each product if there is the possibility of stereoisomerism. If a racemate is formed, show only one of the enantiomers, and label it as racemic.



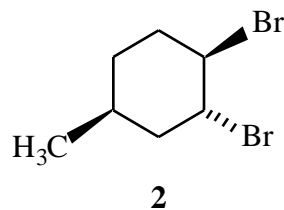
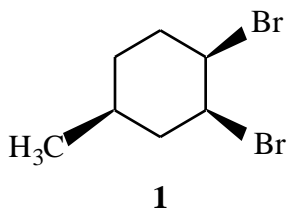
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3) (24 pts) Give reagents for accomplishing the following transformations. Try to make your synthesis efficient (i.e. the desired product should be the single major product if possible).



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4) (20 pts) For this question, you should recall that a bromine atom is almost exactly the same size sterically as a methyl group.



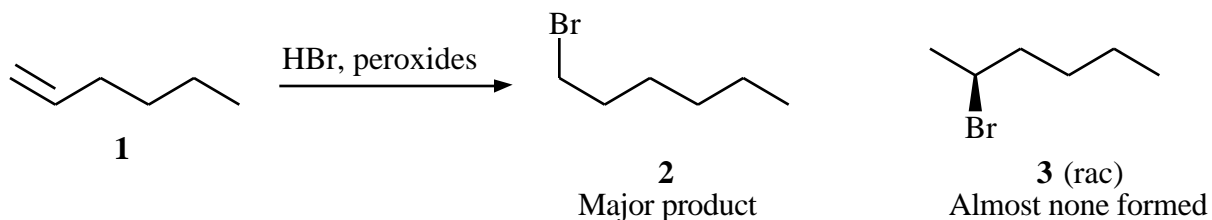
- a) Label each stereocenter in both structures **1** and **2** as (R) or (S).
- b) Carefully draw the two chair conformations for both compounds **1** and **2** and circle the most stable conformation for each compound.

Two chairs for compound **1**, most stable one circled

Two chairs for compound **2**, most stable one circled

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5) (20 pts) Treatment of 1-hexene (**1**) with HBr in the presence of peroxides gives mostly 1-bromohexane (**2**), as shown below.



a) Give an arrow-pushing mechanism for formation of compound **2** from compound **1**. In your mechanism, you only need to show the two chain propagation steps (this is a hint, folks).

b) Explain briefly why the major product is compound **2**, and why very little of isomer **3** is produced.