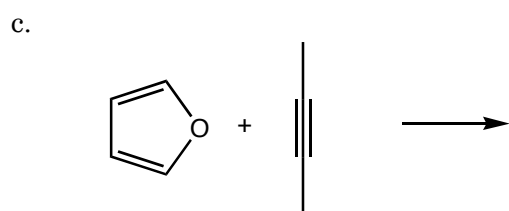
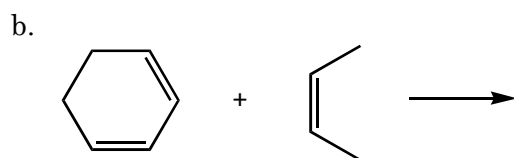
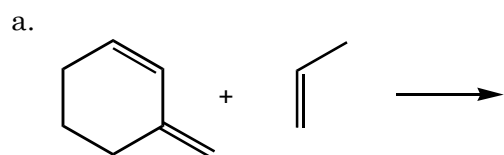
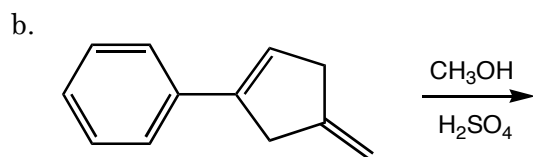
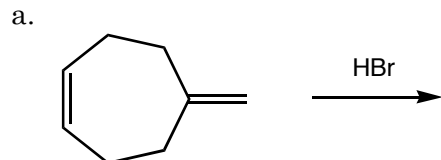


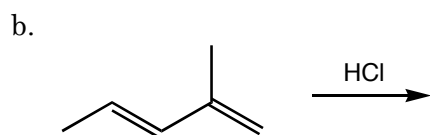
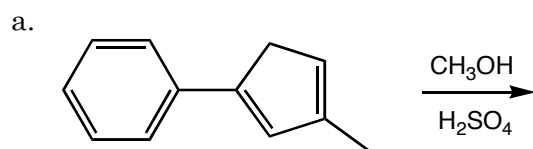
1. (5 pts. each) Determine the products of the following reactions. Remember to indicate the stereochemistry of the products where appropriate. If no reaction occurs, write "no reaction".



2. (12 pts.) Determine the products of the following reactions. Label the major and minor product.

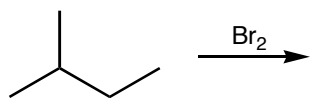


3. (12 pts.) Determine the products of the following reactions, indicate which is the kinetic and thermodynamic products.

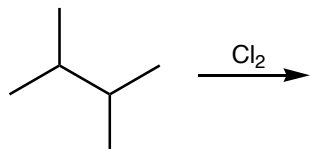


4. (12 pts.) Determine the yields of the products of the following reactions. (Important ratios 1600:82:1 and 5:3.8:1)

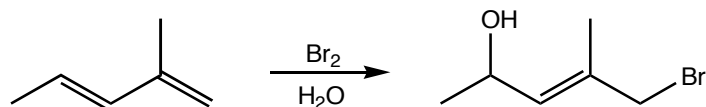
a.



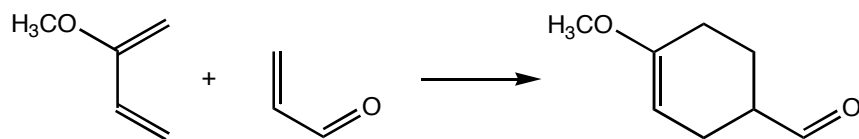
b.



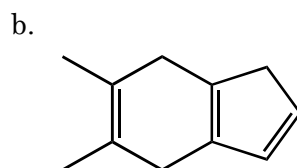
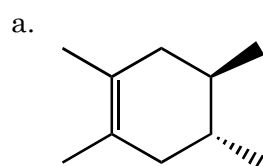
5. (10 pts.) Draw a mechanism for the following reaction.



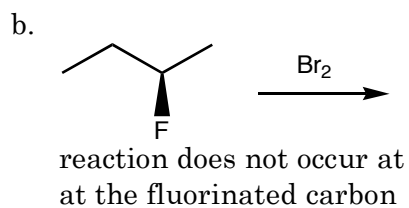
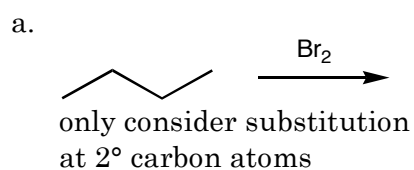
6. (10 pts.) Draw an alternate product for the following Diels-Alder reaction, and explain why the product shown below is the preferred product (draw resonance forms if necessary).



7. (5 pts. each) From a diene and a dienophile make the following molecules.



8. (5 pts. each) Identify the products, and the number of chiral centers that form.



9. (5 pts. each) Predict the products for the following reactions.

