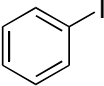
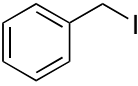

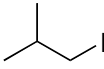
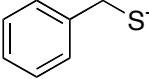
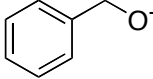
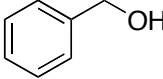
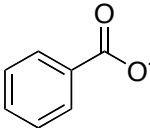
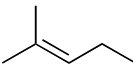
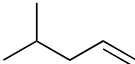
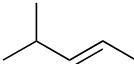
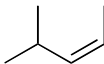


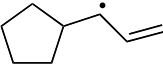
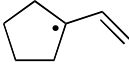



1. Make sure your exam has 9 numbered pages plus a periodic table.
2. Write your initials on each page.
3. Look over entire exam before starting and carefully read all instructions.
4. Show work for partial credit.

<b>Page</b>	<b>Possible Points</b>	<b>Total</b>
<b>1</b>	<b>12</b>	
<b>2</b>	<b>20</b>	
<b>3</b>	<b>16</b>	
<b>4</b>	<b>14</b>	
<b>5</b>	<b>10</b>	
<b>6</b>	<b>10</b>	
<b>7</b>	<b>4</b>	
<b>8</b>	<b>14</b>	
<b>Total</b>	<b>100</b>	
<b>8</b>	<b>5</b>	
<b>XC</b>	<b>105</b>	

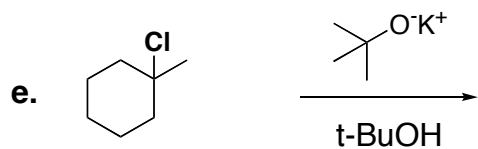
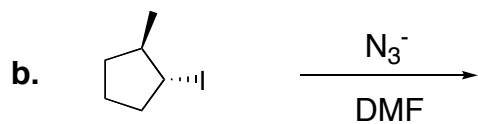
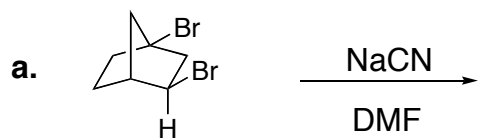
1. (12 points)

<b>a. Rank in order of S<sub>N</sub>2 reactivity (1= most reactive)</b>			
			
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>b. Rank in order of leaving group ability (1= best leaving group)</b>			
NH <sub>2</sub> <sup>-</sup>	H <sub>2</sub> O	Cl <sup>-</sup>	I <sup>-</sup>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>c. Rank in order of nucleophilicity (1= best nucleophile)</b>			
			
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>d. Rank in order of alkene stability (1= most stable)</b>			
			
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>e. Rank in order of radical stability (1= most stable)</b>			
			
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>f. Circle the best solvent for an S<sub>N</sub>2 reaction.</b>			
		CH <sub>3</sub> OH	

Initials

Points

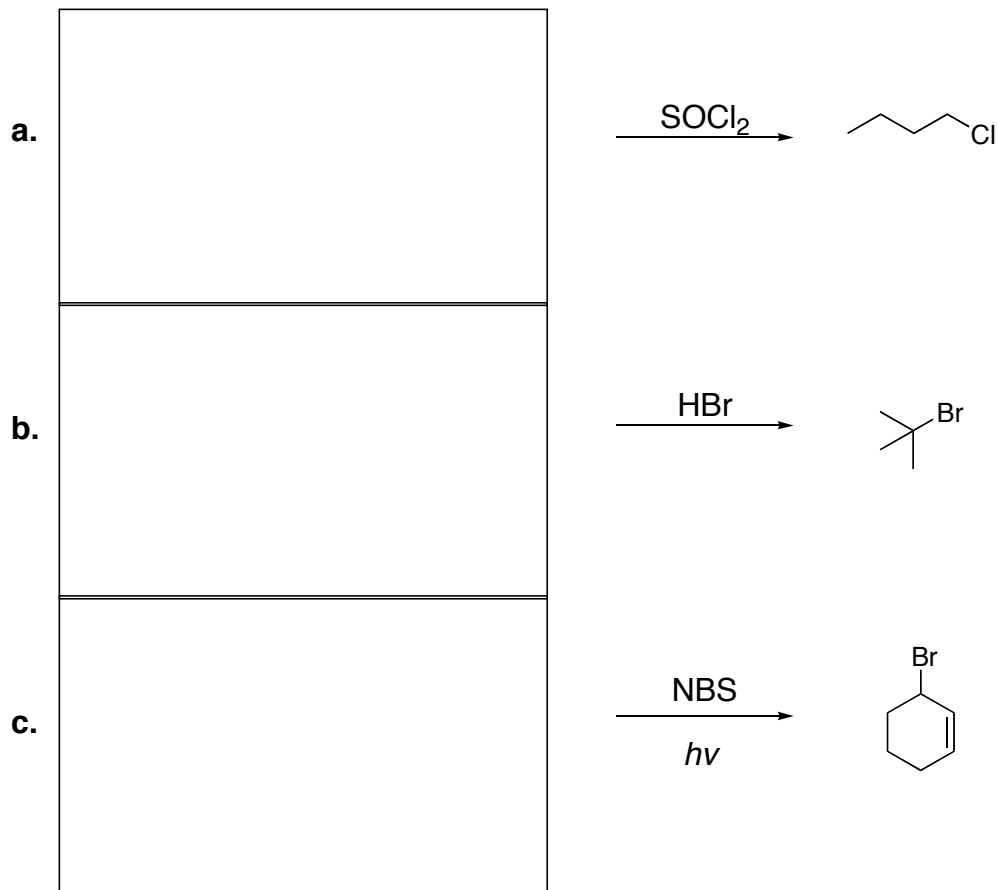
2. (20 points) Draw the structure of the products of the following reactions. Indicate stereochemistry where appropriate. If there is no reaction, write "NR".




Initials

Points

3. (12 points) Draw the structure of the starting materials for the following reactions.



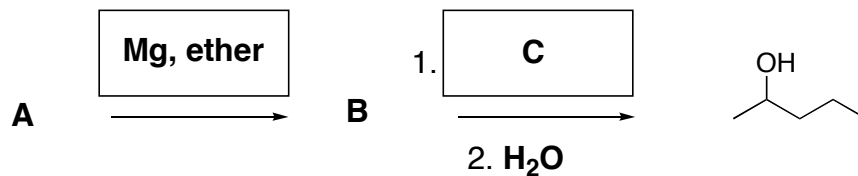
4. (4 points) Draw the structures of **A** and **B**.



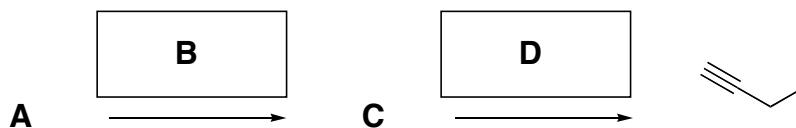
Initials

Points

5. (6 points) Draw the structures of the starting materials and reagents (**A**, **B**, **C**) for the following reaction.



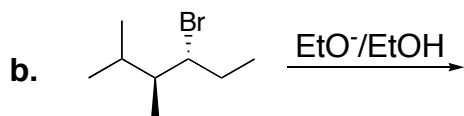
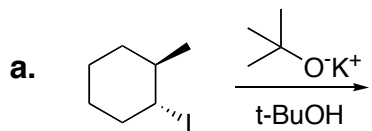
6. (8 points) Draw the structure of the starting materials and reagents (**A**, **B**, **C**, **D**) for the following reaction.



Initials

Points

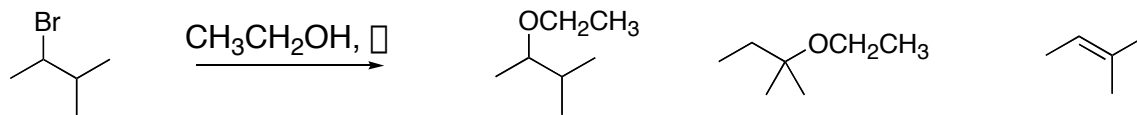
7. (10 points) Draw the MAJOR product and a detailed mechanism for the following reactions. Specify correct stereochemistry where appropriate.



Initials

Points

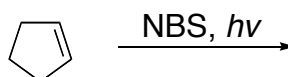
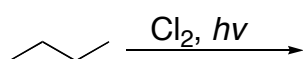
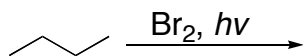
8. (10 points) Draw a detailed mechanism that accounts for each of the following products.



Initials

Points

9. (4 points) Circle the reactions that are synthetically useful (i.e. give only one major product).

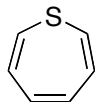
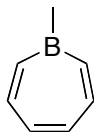
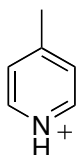


Initials

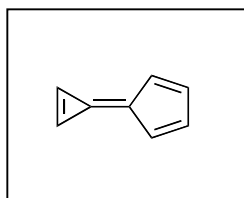
Points



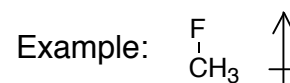
10. (6 points) Circle the heterocycles that are aromatic.



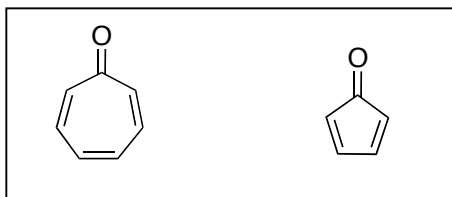
11. (4 points) Draw the dipole moment of calicene, if there is one.



calicene



12. (4 points) Which molecule is more stable? Explain why in 1-2 sentences.

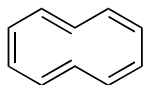


Initials

Points

**Extra Credit:**

The compound shown below is not aromatic. Explain why not. Draw a picture or a model if this will help explain your reasoning.



**Initials**

**Points**