

Practice Exam 4ii - Answers

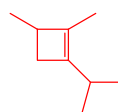
1. B, E, J, N, R, X, Y, DD

2.



3. H_2 , Lindlars catalyst or Ni_2B ;

HBr



+ peroxides;

4. Here are some descriptions of the routes: You should be able to put together the synthetic schemes.

<p><i>The challenge: you cannot selectively brominate adjacent to an alcohol.</i></p> <p><i>Retrosynthesis: You know how to make a bromohydrin from an alkene. The alkene required here is cyclohexene, which you can make from cyclohexanol</i></p> <p>2 steps – Treat the alcohol with a strong acid to promote dehydration to give cyclohexene. Treat the cyclohexene with Br_2 in H_2O.</p>	<p><i>The challenge: to install a hydroxyl and a methoxy group trans to one another..</i></p> <p><i>Retrosynthesis: This is tricky – but you need to recognize that the product can be formed by nucleophilic ring opening of cyclohexene oxide with methoxide.</i></p> <p>2 steps – Epoxidation (mCPBA) of cyclohexene gives an epoxide, which upon treatment with NaOCH_3 gives the product.</p>	<p><i>The challenge: To incorporate an alkyne at the end of the $\text{C}=\text{C}$ of the starting material.</i></p> <p><i>Retrosynthesis: The product can be made by reaction of a 1° bromide with sodium acetylide in an $\text{S}_{\text{N}}2$ reaction. The 1° bromide can be made by anti-Markovnikov addition of HBr to the alkene starting material.</i></p> <p>2 steps- Anti-Markovnikov addition of HBr in the presence of peroxides gives 1-bromo-3,3-dimethylbutane. Reaction with sodium acetylide gives the final product.</p>
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5. Base promoted double dehydrobromination of 1,2-dibromocyclohexane gives 1,3-cyclohexadiene, not cyclohexyne. Cyclohexyne would be very unstable because the sp hybridized carbon atoms are forced to bend in a relatively small ring. This strain energy is so high that cyclohexyne has never been isolated at room temperature.

