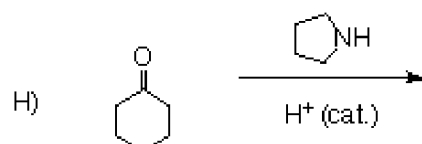
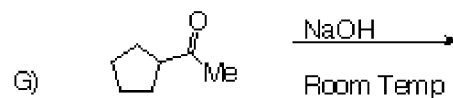
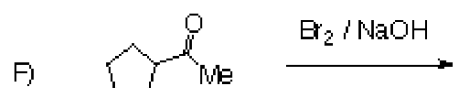
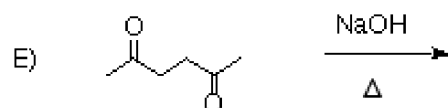
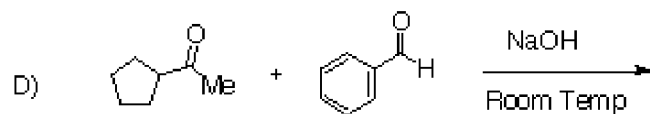
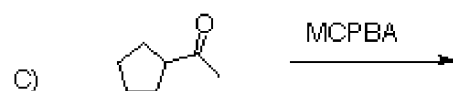
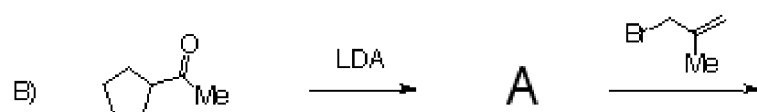
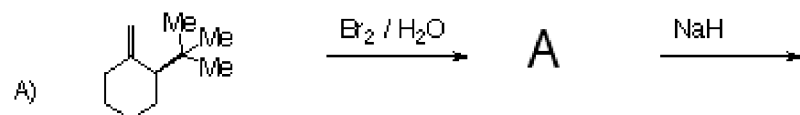


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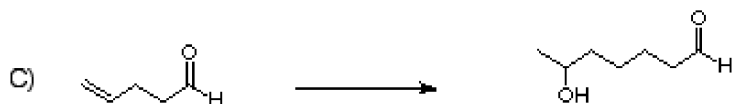
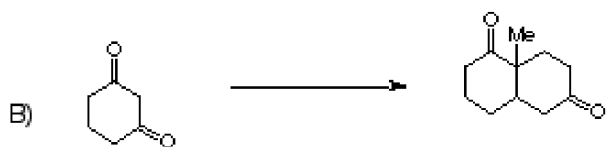
Please read the questions carefully.

1) Provide the products of the following reactions. If no reaction would occur, then write NR. Draw all possible stereoisomers and indicate if they would be produced in equal or unequal amounts. If they are formed in unequal amounts, indicate the major isomer. Be sure to write the structure of the intermediates "A." (5 points each)

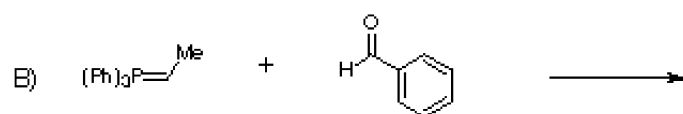
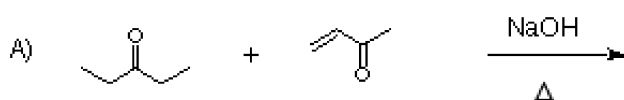
Don't forget to draw all the stereoisomers for each reaction!



2) Complete Two of the three syntheses shown below using organic reagents of 3 carbons or less and any inorganic reagents you wish. If you want partial credit, then write the product of each reaction (15 points each). Clearly indicate which problem you don't want graded.



3) Provide the product and mechanism for the following reactions. Be sure to indicate the stereochemistry of the product and to draw each arrow and show each step of the reaction for full credit. (7 points each)



C) For the reaction shown above, draw the transition state for the step in which the stereochemistry of the product is determined. (i.e., explain with a picture why the olefin is produced with a certain stereochemistry)

4) Of the two reactions shown below, which equilibrium constant is greater, K_1 or K_2 ? Provide an explanation of your answer in 2 sentences or less. (6 points)

