1. a. (5 pts. ea.) a. Identify whether the reaction is likely to proceed via an $S_N1$ or an $S_N2$ mechanism.
   b. (10 pts. each) Predict the organic products for the following reactions. Remember to indicate the stereochemistry of the products using wedge (\[\rightarrow\]) and dashed bonds (\[\cdots\]) where appropriate.
   i. \[
   \begin{array}{c}
   \text{OH} \\
   \text{PBr}_3
   \end{array}
   \]
   ii. \[
   \begin{array}{c}
   \text{OH} \\
   \text{ZnCl}_2
   \end{array}
   \]
   iii. \[
   \begin{array}{c}
   \text{OH} \\
   \text{HCl}
   \end{array}
   \]

2. (10 pts. ea.) Predict the organic products for the following reactions. Remember to indicate the stereochemistry of the products using wedge (\[\rightarrow\]) and dashed bonds (\[\cdots\]) where appropriate.
   a. \[
   \begin{array}{c}
   \text{O} \\
   \text{HCl} \\
   \text{excess}
   \end{array}
   \]
   b. \[
   \begin{array}{c}
   \text{O} \\
   \text{HBr} \\
   \text{excess}
   \end{array}
   \]
   c. \[
   \begin{array}{c}
   \text{O} \\
   \text{HI} \\
   \text{excess}
   \end{array}
   \]