1. Provide a multistep synthesis- usual rules apply

\[ \text{R}CH\text{CH}_2\text{CH}_2\text{CH}_2\text{CHO} \rightarrow \text{PhCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{C} = \text{O} \]

2. Provide a multistep synthesis- usual rules apply

\[ \text{C}_6\text{H}_{11} \rightarrow \text{PhCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CHO} \]

3. Provide a mechanism

4. Provide a structure and mechanism for the formation of 1 and a mechanism for its conversion into structure 2.

5. Follow the instructions for Database Tutorial 6. Find another set of conditions that does not use a Ru catalyst for the oxidation of phenyl to give an amino acid.