[1] Explain why ketone A isomerizes in aqueous base (see below) whereas B does not undergo a similar isomerization.

\[ \text{A} \quad \xrightleftharpoons{\text{aq. NaOH}} \quad \text{B} \]

[2] Propose reasonable mechanisms for the following reactions.

(a) \[ \text{HO} \xrightarrow{\text{H}_2\text{SO}_4} \text{HO} \]

(b) \[ \text{1. NaOH, Cl}_2 \xrightarrow{\text{2. H}_2\text{O}^+} \text{CO}_2\text{H} \]

(c) \[ \text{Ph} \xrightarrow{\text{aq. NaOH}} \text{Ph} \]

(d) \[ \text{CH}_2\text{O} / \text{H}_3\text{O}^+ \]

[3] Propose efficient synthetic routes for following compounds from cyclohexanol and other reactions of your choice. Mechanisms are not required.

(a) \[ \text{CHO} \]

(b) \[ \text{CHO} \]

(c) \[ \text{Ph} \]