1. (10 points) Using any piece that contributes three or fewer carbons to the final product, and any monosubstituted benzene derivative that contributes at most one carbon to the final product, outline a synthesis of A.

\[ \text{A} \]

2. (10 points) Deduce the structure of C, and draw an arrow-pushing mechanism for its formation.

\[ \text{C} \]

\[ \begin{align*}
\text{C}_9\text{H}_{10}\text{O}_2 & \quad \text{IR: 3480, 1620 cm}^{-1} \\
13^\text{C} \text{NMR} & \\
200.4, \text{s} \quad 7.98, \text{d, } J = 7.8 \text{ Hz, } 2\text{H} \\
136.6, \text{s} \quad 7.60, \text{m, } 1\text{H} \\
133.5, \text{d (2)} \quad 7.50, \text{m, } 2\text{H} \\
128.6, \text{d} \quad 4.02, \text{t, } J = 5.3 \text{ Hz, } 2\text{H} \\
128.0, \text{d (d)} \quad 3.22, \text{t, } J = 5.3 \text{ Hz, } 2\text{H} \\
58.0, \text{t} \quad 2.87, \text{bs, } 1\text{H (exchanges)} \\
40.3, \text{t} 
\end{align*} \]

3. (10 points) Draw an arrow-pushing mechanism for the conversion of D to E.

\[ \text{D} \]