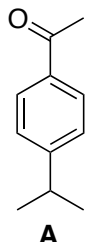
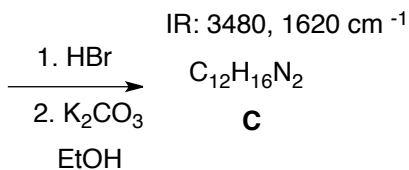
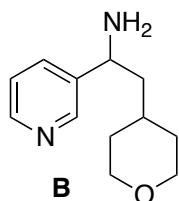


1. (10 points) Using any piece that contributes three or fewer carbons to the final product, and any monosubstituted benzene derivative that contributes at most seven carbons to the final product, outline a synthesis of **A**.



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



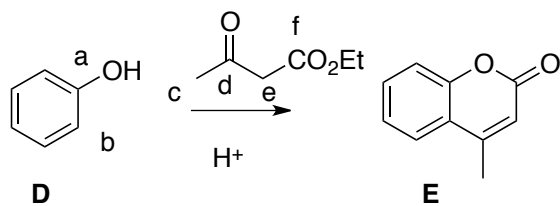
¹³C NMR

149.1, d
 147.1, d
 138.9, s
 134.9, d
 122.9, d
 56.3, d
 49.4, t
 42.0, t
 32.4, d
 26.8, t
 25.9, t
 21.8, t

¹H NMR

8.67, m, 1H
 8.47, m, 1H
 7.74, m, 1H
 7.24, m, 1H
 4.02, dd, J = 5.6, 8.9 Hz, 1H
 3.1, m, 2H
 3.05, m, 2H
 2.2, m, 1H
 1.9, m, 1H
 1.6, m, 5H

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



bb	bf