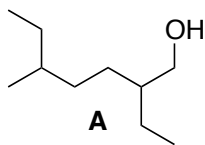
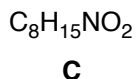
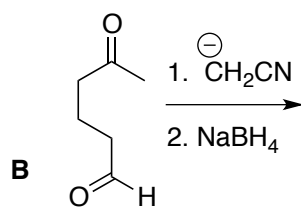


1. (10 points) Using any piece that contributes three or fewer carbons to the final product, outline a synthesis of **A**.



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



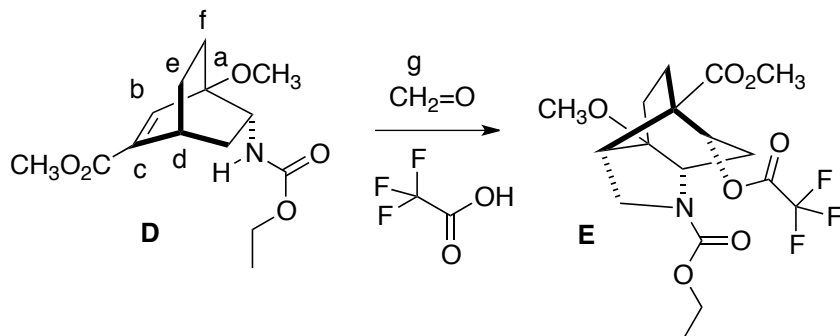
^{13}C NMR

21.5, q
 23.8, t
 26.2, t
 36.1, t
 38.2, t
 67.4, d
 67.8, d
 117.8, s

1H NMR

1.20, d, $J=6.2$ Hz, 3H
 1.4-1.7, m, 6H
 2.50, dd, $J=5.1, 16.6$ Hz, 1H
 2.56, dd, $J=6.3, 16.6$ Hz, 1H
 3.1, m, 2H (exchanges)
 3.83, m, 1H
 3.95, m, 1H

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



bb | bf