1. Synthesize the following amine by two different reductive aminations (i.e., using two different amines). Include structures and names for all reactants, major intermediates, and the product. (3 pts)

$$\begin{array}{c|c} & \text{CH}_3 \\ \text{CH}_2 & \text{N} \\ \text{CH} & \text{H} \\ \text{CH}_3 \end{array}$$

2. Show how to accomplish the following conversion by both Hoffman and Curtius rearrangements. Include structures and names for all reactants and intermediates, as well as for the product. (4 pts)

3. Show how to accomplish the following conversion using a Sandmeyer reaction. Include structures of all intermediates, and name the class of reaction for each step. Friedel-Crafts acylation needs to be done first, as in example 24.4 in McMurry. Refer to pp 576-7 in 8e (or 555-6 in 7e) for limitations on Friedel-Crafts reactions. (3 pts)