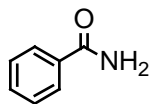
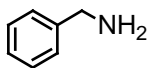


**Homework/Problem Set**  
**Chapter 20 (Amines)**

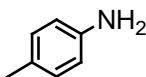
1. Which of the following compounds would be the strongest base?



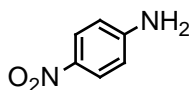
I



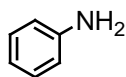
II



III



IV

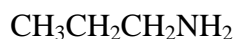


V

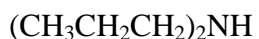
2. Arrange the following amines in order of decreasing basicity (most to least) in aqueous solution:



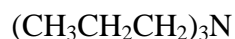
I



II



III



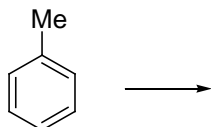
IV

3. The overall conversion: **RBr**  $\longrightarrow$  **RCH<sub>2</sub>NH<sub>2</sub>**

can be accomplished by successive application of which of these sets of reagents

- A) Mg, ether; then NH<sub>3</sub>
- B) NaN<sub>3</sub>; then LiAlH<sub>4</sub>, ether
- C) NaCN; then LiAlH<sub>4</sub>, ether
- D) H<sub>2</sub>C=O; then NH<sub>3</sub>
- E) H<sub>2</sub>NOH; then LiAlH<sub>4</sub>, ether

4. Show how you might prepare *para*-fluorotoluene from toluene.



5. Outline preparation of the 2-methyl-1-propanamine using the Gabriel synthesis.