Quiz A

1. Draw three important resonance forms for phenol, PhOH. Show all lone pairs and any formal charges on the atoms that bear them.

2. As you know, typical ammonium ions have pK_as in the 9-12 range. One really stunning exception is the anilinium ion, $PhNH_3^+$ whose pK_a is 4.6 (as strong as a carboxylic acid!).

   (a) Write and balance the reaction of the anilinium ion acting as an acid. Include mechanistic arrows where needed. For comparison, do the same for $CH_3NH_3^+$ which will represent a typical ammonium ion.

   (b) Draw and label an energy diagram that compares the two reactions you wrote above, and that reflects the relative pKas. Put the acids at the same energy level, and show any energy differences on the base side of the reaction.

   (c) All of the above is *descriptive*, it illustrates or expresses what we know about the system. Now explain *why* anilinium ion is such a strong acid compared to typical ammonium ions. Think before you write and do not ramble. An illustration may be valuable.