2007 Mechanisms Quiz #1  20 points

NAME: _____________________________

1-4) Draw in all the lone pairs for the following molecules:

a)  
   \[
   \begin{aligned}
   &\text{NH}_2 \\
   &\text{HO}
   \end{aligned}
   \]

b)  
   \[
   \begin{aligned}
   &\text{S} \\
   &\text{Cl}
   \end{aligned}
   \]

c)  
   \[
   \begin{aligned}
   &\text{N} \\
   &\text{Ph}
   \end{aligned}
   \]

d)  
   \[
   \begin{aligned}
   &\text{Al} \\
   &\text{Cl}
   \end{aligned}
   \]

5-8) What is the hybridization of:

   the Nitrogen in (a)

   the Nitrogen in (b)

   the Nitrogen in (c)

   the left hand side Chlorine attached to the positive Chlorine in (d).

9-11) Circle the most acidic hydrogen in each of these molecules.

a)  
   \[
   \begin{aligned}
   &\text{OH} \\
   &\text{CF}_3
   \end{aligned}
   \]

b)  
   \[
   \begin{aligned}
   &\text{MeO}_2\text{C} \\
   &\text{O} \\
   &\text{HO} \\
   &\text{CO}_2\text{H}
   \end{aligned}
   \]

c)  
   \[
   \begin{aligned}
   &\text{F} \\
   &\text{S}
   \end{aligned}
   \]
12-17) Draw all the resonance structures for the following species, and draw curly arrows to show the electron reorganization.

\[ \text{Resonance structures for } \text{species} \]

18-20) Indicate whether the pairs shown are tautomers or resonance structures.

\[ \text{Pairs for tautomers or resonance structures} \]
1-4) Draw in all the lone pairs for the following molecules:

a)

b)

c)

d)

5-8) What is the hybridization of:

- the Nitrogen in (a) \(sp^3\)
- the Nitrogen in (b) \(sp^2\)
- the Nitrogen in (c) \(sp^3\)
- the left hand side Chlorine attached to the positive Chlorine in (d) \(sp^3\)

9-11) Circle the most acidic hydrogen in each of these molecules.
12-17) Draw all the resonance structures for the following species, and draw curly arrows to show the electron reorganization.

18-20) Indicate whether the pairs shown are tautomers or resonance structures.