Practice Exam

1. Draw orbital overlap pictures for these three molecules:



Rank the stability of the lone pairs of these three molecules from most stable to leas stable.

Referring to your orbital overlap pictures, explain how you chose the most stable lone pair.

Referring to your orbital overlap pictures, explain how you chose the least stable lone pair.

2. Label the hybridization of all the heteroatoms in these molecules.

 

Histidine (amino acid) Adenine (building block of ATP)

3. Draw bond line formula for these compounds:



4. Draw three significant resonance structures for this compound:



Draw a resonance hybrid for the molecule:

Which of the resonance structures could be used to explain why there is an exceptionally reactive carbon in this molecule?

Is the lone pair on nitrogen more or less stable than a lone pair on a typical amine? Explain.