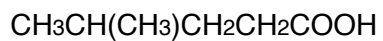
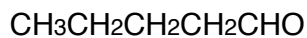


## CEM 251, Problem Set 1: Chapter 1

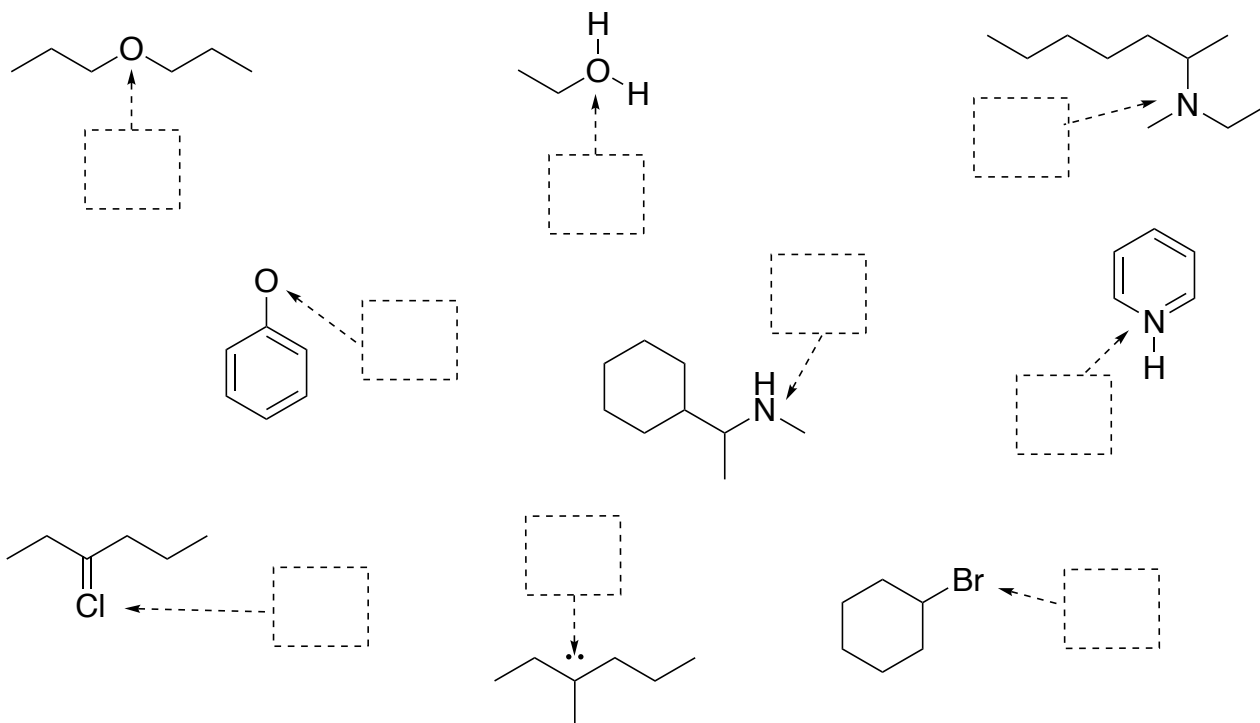
1. Draw the correct electron configuration for phosphorus ( $^{15}\text{P}$ ).



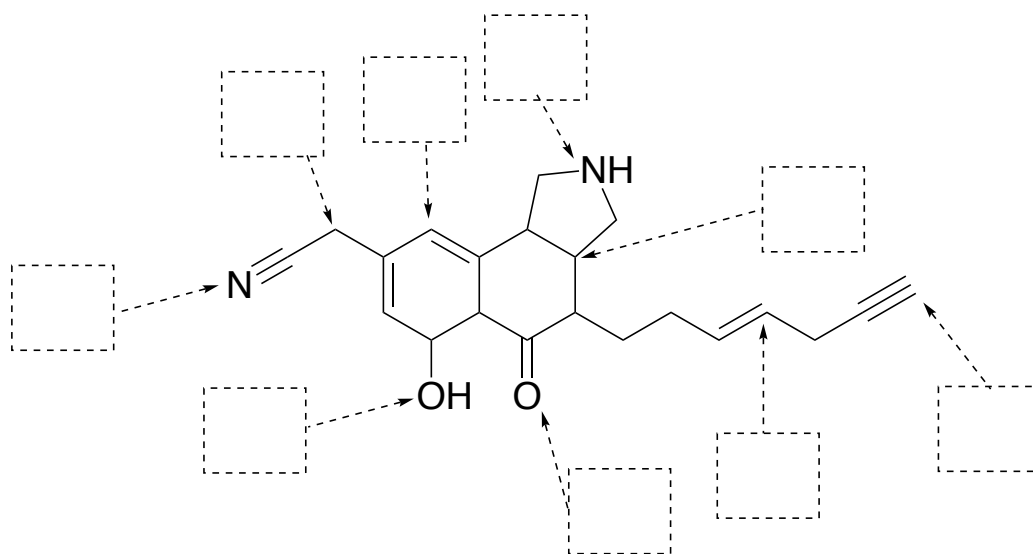
2. Convert the following condensed structures into the corresponding **stick** structure.



3. Calculate the **Formal Charge** for each of the indicated atoms. Make sure you add lone pairs on **heteroatoms**, when appropriate based on the full octet rule, and consider them during your calculations.



4. Indicate the hybridization of each of the indicated atoms in the following molecule.



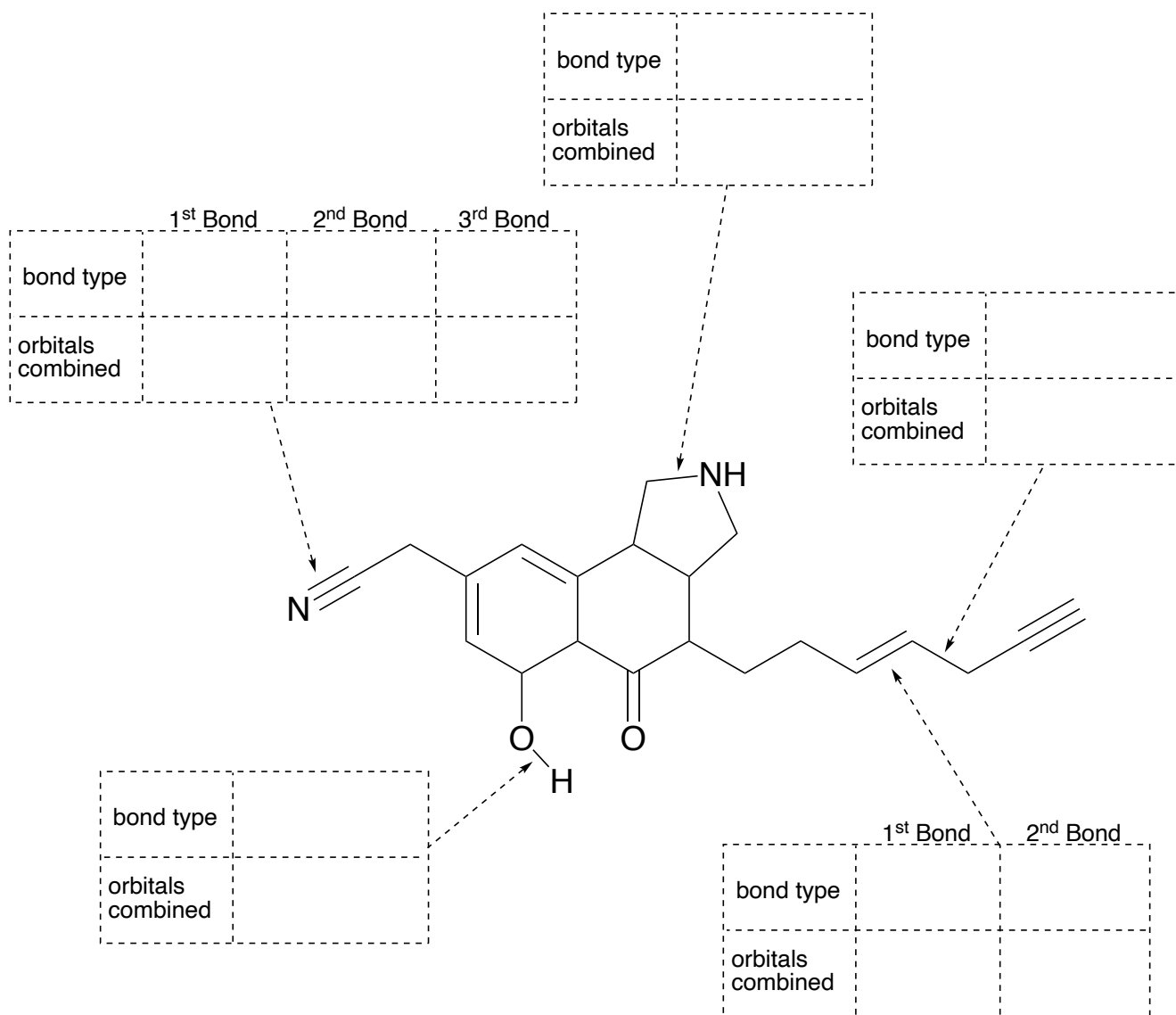
How many  $\pi$  bonds are there in this molecule?

How many  $\pi$  electrons are there in this molecule?

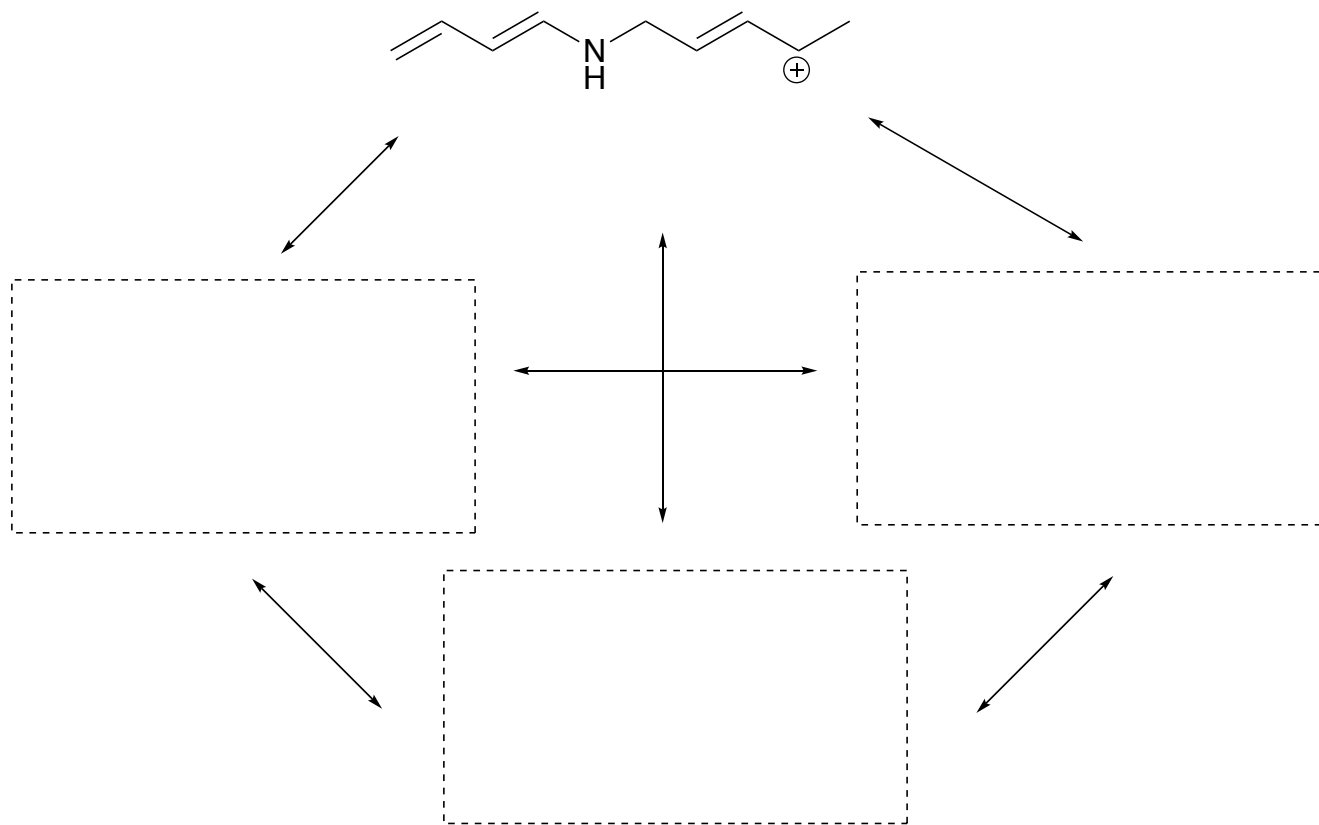
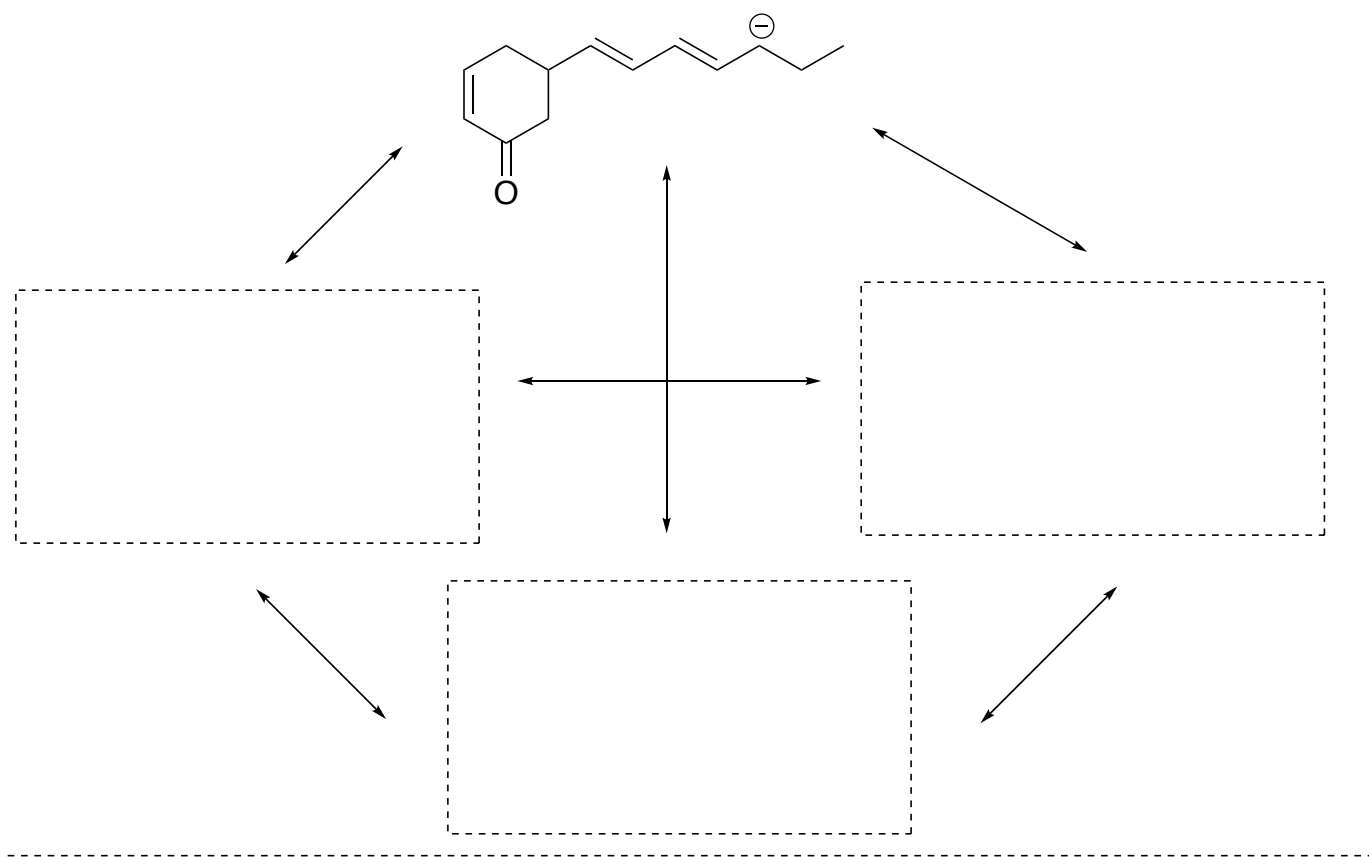
5. Answer the following questions regarding the indicated bonds:

a. What is the bond type ( $\sigma$  or  $\pi$  bond)?

b. What orbitals from each atoms are combined to form the bond?



6. Draw 3 valid resonance structures for each of the following compounds.



7. Identify the functional groups highlighted in these molecules:

