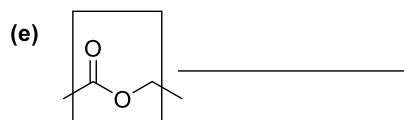
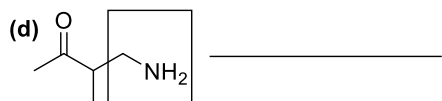
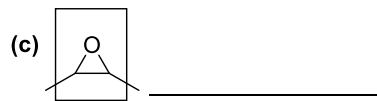
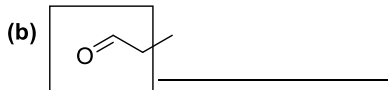
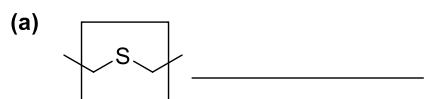
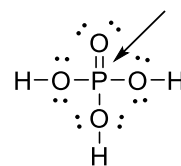
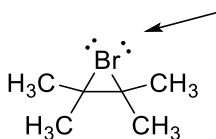
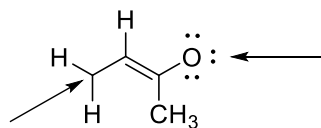


Key Topics: *Lewis Structures, Formal Charge, Resonance, Hybridization, Functional Group Identity*

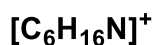
1. On each line below, write the generic functional group being highlighted by each box. Do not name the compound, just indicate the functional group being highlighted. (2pts each)



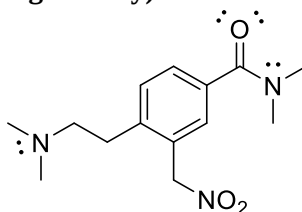
2. Identify the formal charge at each atom indicated by an arrow. Assume all hydrogens and lone pairs that are present have been shown. (1pt each)



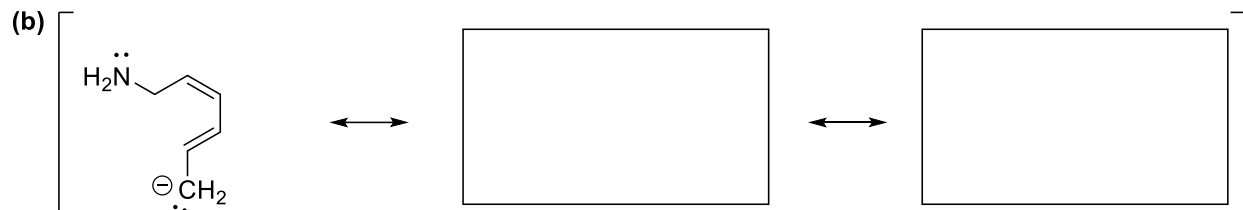
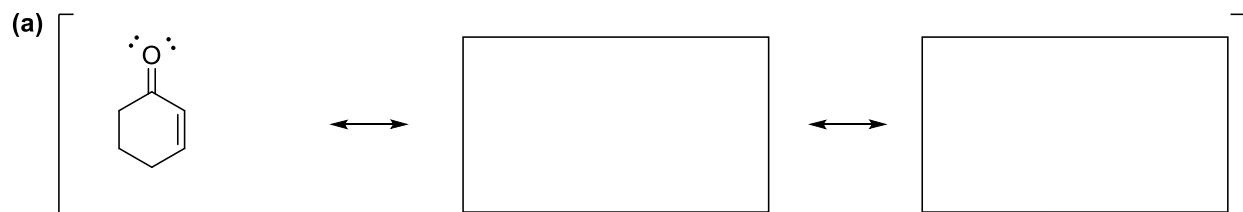
3. Draw a valid Lewis structure (bond-line structure also fine) having the molecular formula below. Be sure to show the formal charge in your structure. If applicable, show lone electron pairs. (3pts)



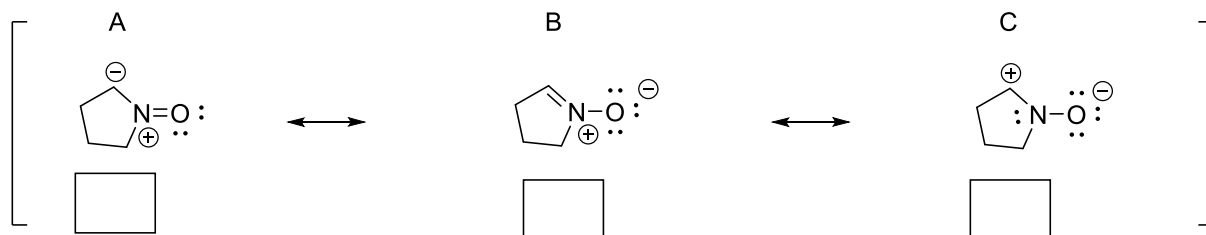
4. Identify the hybridization state and geometry for each nitrogen atom in the structure below. It may help to draw other resonance structures or draw the functional group out to determine each accurately. (1pt each for correct hybridization and geometry)



5. For each structure below, **draw the best two additional resonance structures**. Include lone-pairs and formal charges where applicable. (3pts for each best additional resonance structure)



(c) Rank the resonance structures A-C below in terms of best to worst contributing. (1 = best, 3 = worst) Then, provide a very brief explanation (no more than two sentences) to justify the best one. (2pts for ranking, 3pts for valid explanation)



Explanation:

6. For each molecular formula below, draw a valid Lewis structure (bond-line structure also fine). Each atom should be neutral and obey the octet rule. Include lone electron pairs where applicable. It will be helpful to determine the degrees of unsaturation first. (3pts for each valid structure).

