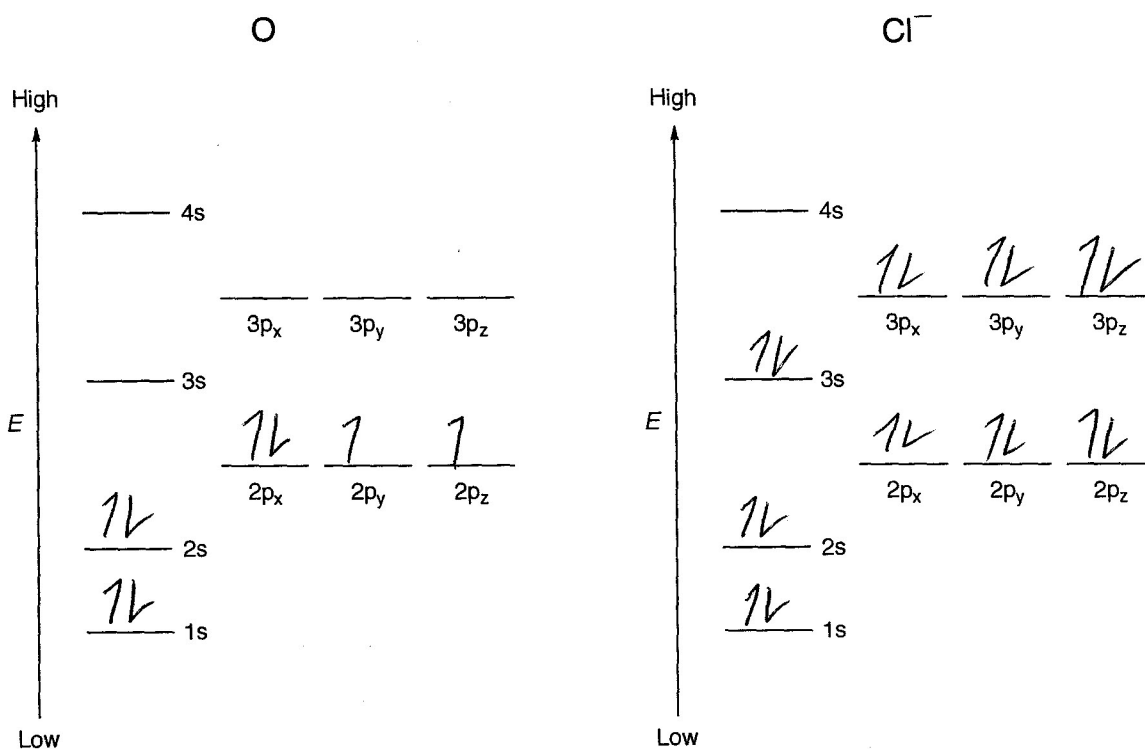


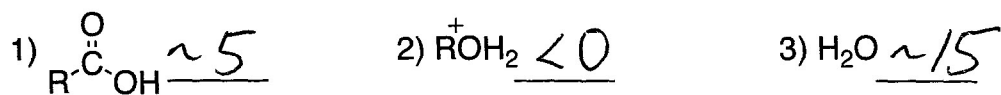
**Question 1. (2 points each, total 10 points).** How many valence electrons do the following neutral atoms have?

- 1) carbon 4    2) nitrogen 5    3) oxygen 6    4) boron 3  
 5) iodine 7

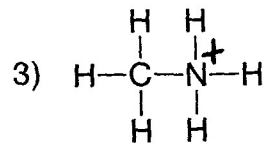
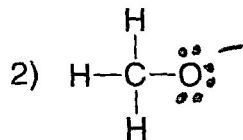
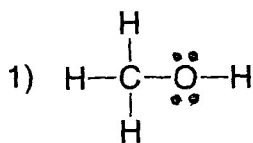
**Question 2. (5 points each, total 10 points).** Draw the ground-state electronic configuration for:



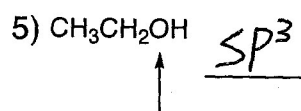
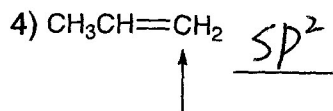
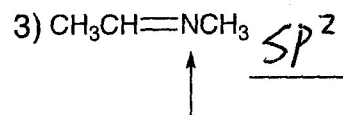
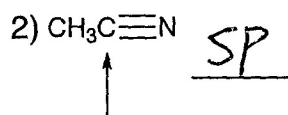
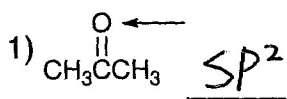
**Question 3. (2 points each, total 10 points).** Please provide approximate pK<sub>a</sub> value for:



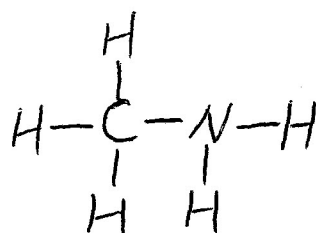
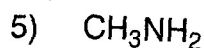
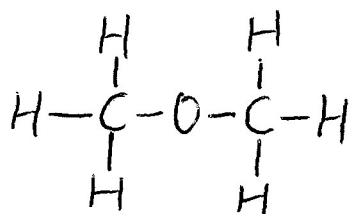
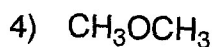
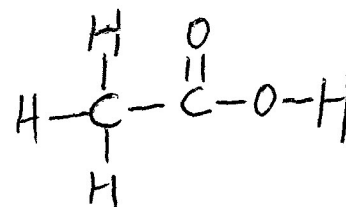
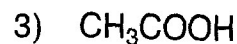
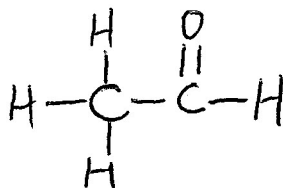
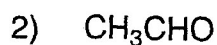
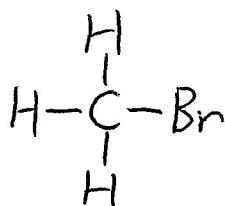
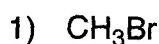
**Question 4. (5 points each, total 15 points).** Please draw the missing lone-pair electrons and assign the missing formal charge if there is any.



**Question 5. (3 points each, total 15 points).** What is the hybridization of the indicated atom in each of the following molecules?



**Question 6. (4 points each, total 20 points).** Write the Kekulé structure for each of the following compounds:



**Question 7. (10 points each, total 20 points).** Please number the following compounds in order of increasing pKa value of the most acidic hydrogen atom within the molecule (1 = smallest, 3 = largest).

