Note my standard policy on Lewis structures: (1) Every valid Lewis structure must have all non-zero formal charges labeled, even if your textbook does not ask for this. (2) Don’t bother labeling any formal charges that are zero, even if your textbook does ask for this. (3) If it is possible to eliminate formal charge by invoking valence expansion (for atoms in the 3rd period and below), you should always do it! (4) If it helps you to write down how you calculate the number of valence electrons or formal charges for a species, you are free to do so. But, unless I tell you otherwise, you are not required to do so for full credit.

1. Silberberg 9.5 (3 points). You do not need to justify your answers.

2. Silberberg 9.23 (3 points). You do not need to justify your answers.

3. Silberberg 9.27 (6 points)

4. Silberberg 10.6 (9 points)

5. Silberberg 10.14 (6 points)

6. Silberberg 10.16 (6 points)

7. Silberberg 10.20 (9 points). You do not need to state the type of octet rule exception. Also note that in part (c), two of the three hydrogens are bonded to oxygens, and the third is bonded to the phosphorus.

8. Silberberg 10.22 (b) and (c) (6 points) Again, you do not need to state the type of octet rule exception. Also note that we are skipping part (a)—a proper description of $O_3^-$ requires the use of resonance structures, which we are not dealing with in this problem set.