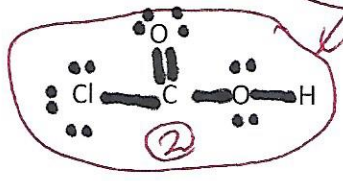
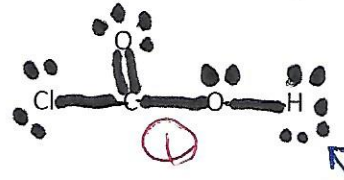


Show work for all questions for partial and full credit. (25 pts total)

1. (a) Given the following two Lewis dot structures which is correct. (5 pts)



valence e = 24
 $7e + 4e + (6e)2 + 1e =$
 Cl C O H

- (b) What is wrong about the incorrect structure? State in a few words. (2 pts)

① $13 \times 2 = 26e$ too many e ② H cannot have more than duet
 ③ Cl & O have less than octet

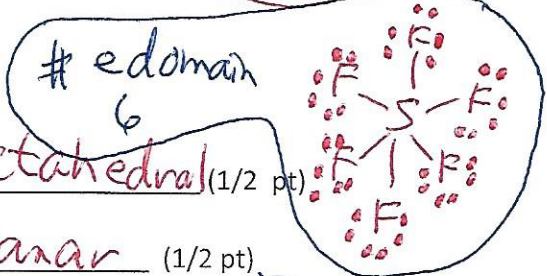
2. How many valence electrons are in the formula PO_4^{3-} Show work. (8 pts)

P group 5 O group 6 - charge
 $5e + (6e)4 + 3e = 32e$

3. Show the Lewis Dot Symbol for the element P (4 pts)



4. Show one correct resonance structure for the following. (5 pts)



Extra Credit: (a) What is the VSEPR shape for the molecule SF_6 ? Octahedral (1/2 pt)

What is the VSEPR shape for the molecule NO_3^- ? trigonal planar (1/2 pt)

What is the VSEPR shape for the molecule NH_3 ? trigonal pyramidal (1/2 pt)

- (b) If the volume of a gas is 78.2 Liters with a pressure at 1.2 atm, at a pressure of 0.92 atm, what is the volume of the gas? ($P_1 V_1 = P_2 V_2$) (1 pt)

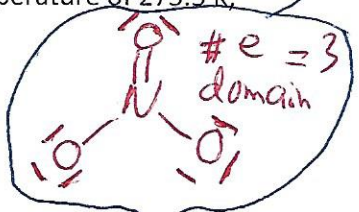
$P_1 = 1.2 \text{ atm}$ $V_1 = 78.2 \text{ L}$ $P_2 = 0.92 \text{ atm}$ $V_2 = ?$
 $(78.2 \text{ L})(1.2 \text{ atm}) = (0.92 \text{ atm}) V_2$
 $V_2 = \frac{(78.2 \text{ L})(1.2 \text{ atm})}{0.92 \text{ atm}} = 102 \text{ L}$

- (c) Convert 780.2 mm Hg to atmosphere. Show work. (1/2 pt)

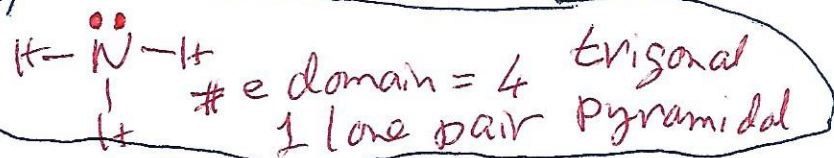
$780.2 \text{ mmHg} \times \left(\frac{1 \text{ atm}}{760 \text{ mmHg}}\right) = 1.026 \text{ atm}$

- (d) Given the equation $\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$ If the pressure of a gas is 0.98 atm at a volume of 1.7 Liters at a temperature of 273.5 K, what is the pressure at 1.03 atm and 398.8 K? (1 pt)

$P_1 = 0.98 \text{ atm}$ $V_1 = 1.7 \text{ L}$ $T_1 = 273.5 \text{ K}$
 $P_2 = 1.03 \text{ atm}$ $T_2 = 398.8 \text{ K}$ $V_2 = ?$



$(1.03 \text{ atm})(V_2) = \frac{398.8 \text{ K}}{273.5 \text{ K}} \times \frac{(0.98 \text{ atm})(1.7 \text{ L})}{1.03 \text{ atm}}$
 $V_2 = 2.358 \text{ L}$



$V_2 = 2.4 \text{ L}$