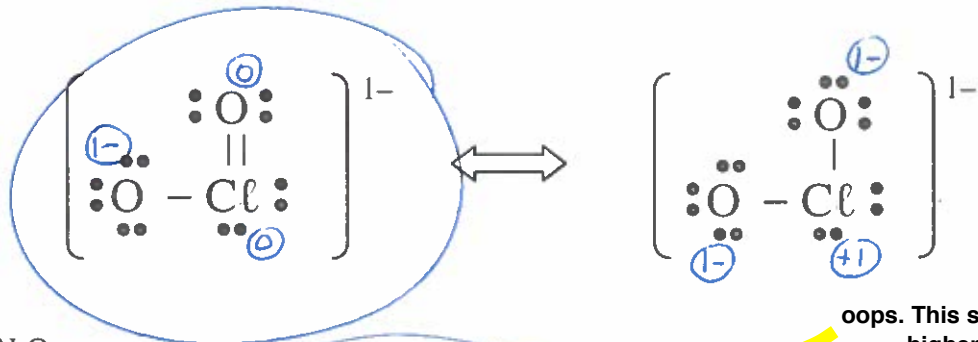


Practice:

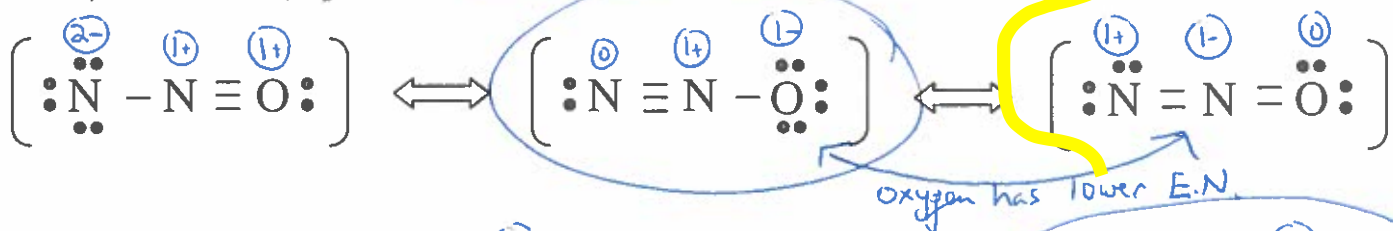
1. For the resonance structures below:

- Calculate the formal charge on each atom in the Lewis structures. Write the formal charge **clearly** beside each atom. You do not need to show your calculations.
- using the general rules above, evaluate the formal charges for each Lewis structure and **determine which structure is the most stable (prevalent) and circle it** (you may have to use one, two or all three of the rules)

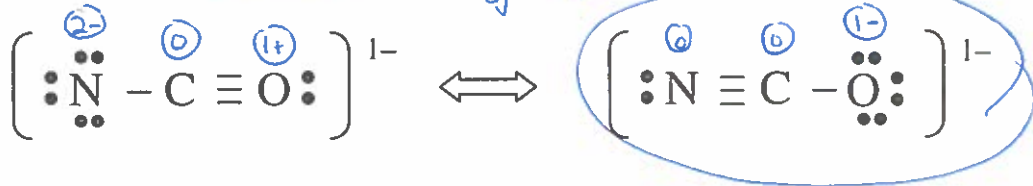
a) ClO_2^-



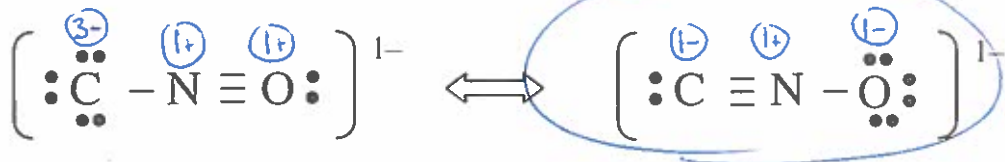
b) nitrous oxide, N_2O



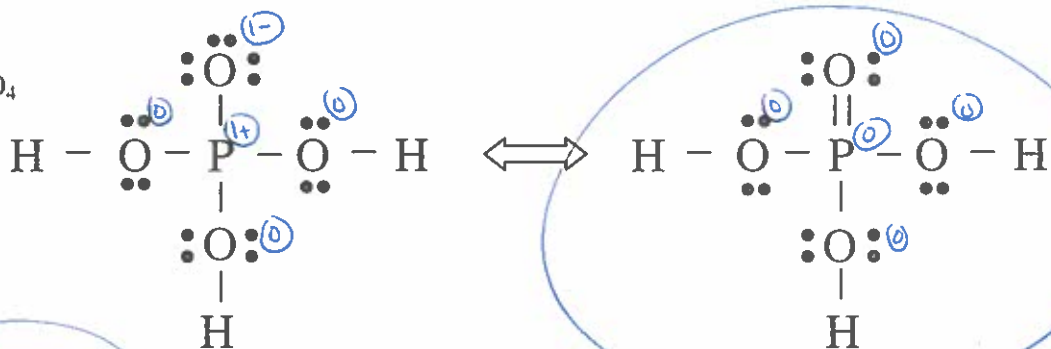
c) cyanate ion, CNO^-



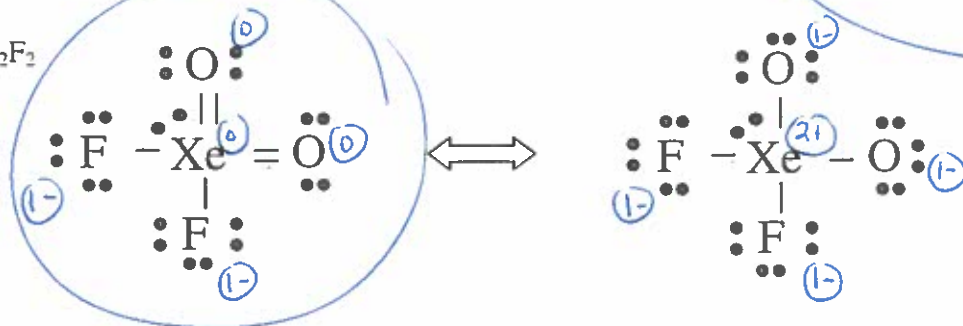
d) fulminate ion, NCO^-



e) phosphoric acid, H_3PO_4



f) XeO_2F_2



Answer the following questions on a separate piece of paper:

2. For the compound thionyl chloride (SOCl_2):

- draw the Lewis structure for SOCl_2 according to the octet rule.
- draw the Lewis structure for SOCl_2 according to the rules for an expanded valence.
- calculate and clearly label the formal charges of each atom on each molecule.
- circle the most stable Lewis structure.

3. Repeat all parts of question #2 for the chemical compound XeO_4

② SOCl_2

we have $\rightarrow 6 + 6 + 2(7)$
 $= 26e^-$

we need $\rightarrow 4(8)$
 $= 32e^-$

$32e^- - 26e^- = 6e^-$ (in bonds)
 $\rightarrow 3$ bonds

4 bonds = $8e^-$

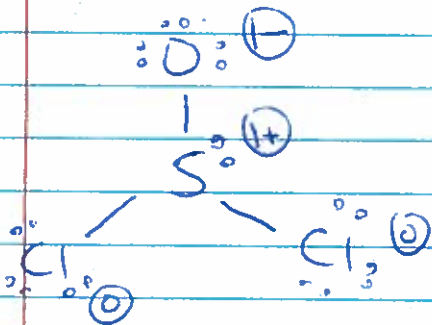
we have $26e^-$

$26e^- - 8e^-$

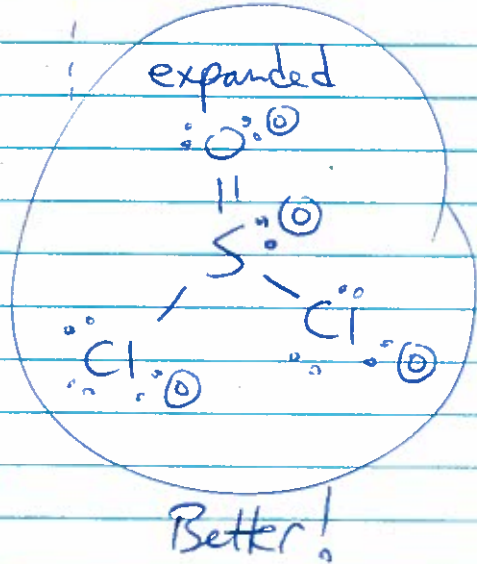
lone pair $e^- = 18e^-$

$\rightarrow 9$ L.p.

octet



vs.



Better!

③ XeO_4

have = $32e^-$ $32e^- - 8e^-$
 need = $40e^-$ = $24e^-$ (in l.p.)

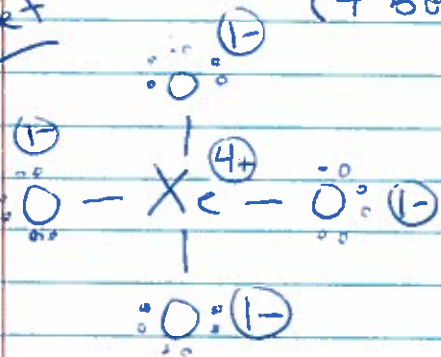
$40e^- - 32e^- = 8e^-$ in bonds
 (4 bonds)

8 bonds = $16e^-$

we have $32e^- - 16e^- = 16e^-$

\downarrow
 8 Lone pairs.

octet



expanded

