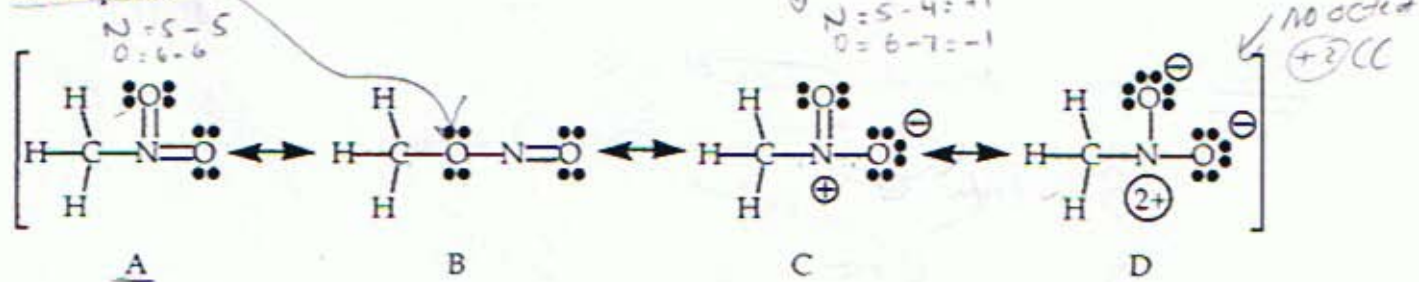


Name: \_\_\_\_\_

$N = 5 - 5 = 0$

-10 III. (26 points total)

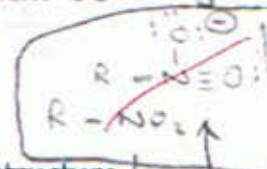
Nitromethane,  $CH_3NO_2$ , is an organic compound in which the carbon is bonded to the nitrogen. Below is a resonance description of nitromethane which is faulty and incomplete.



-4 a. (6 points) What structure(s) should be excluded? Why?

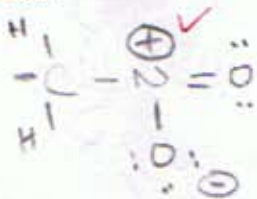
D because high Formal Charge (+2) and does not obey the octet rule in A and B, N also breaks octet rule (-4)

minimum bonding



-1 b. (4 points) An important contributing structure is missing. Provide a structure and explain why it must be included.

This must be included because maximum bonding and low Formal charges and equivalent with A

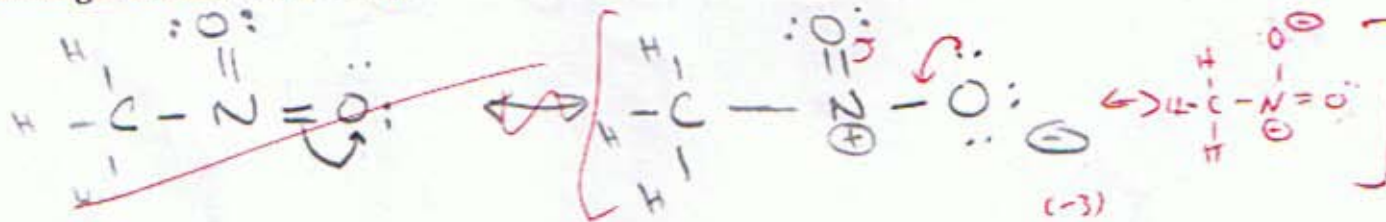


(-1)

maximum bonding breaks octet rule

FC for N = 5 - 4 = +1  
FC for O = 6 - 7 = -1

-3 c. (4 points) Use the curved arrow notation to show how one important structure can be generated from another.



(-3)

✓ d. (6 points) What is the predicted bond order of an NO bond?

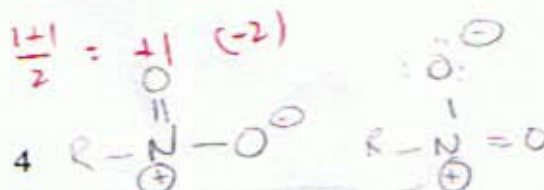
$\frac{3}{2} = 1 \frac{1}{2}$  because of the resonance.

-2 e. (6 points) What is the predicted charge on each oxygen? On nitrogen?

Oxygen  $\frac{0-1}{2} = -\frac{1}{2}$  ✓

Nitrogen  $\frac{0+1}{2} = +\frac{1}{2}$

$\frac{1+1}{2} = +1$  (-2)



$\frac{+1+1}{2} = \frac{2}{2} = 1$

Handwritten notes and scribbles at the bottom left.