AP Chem Unit 2 - Pre Exam - FRQ

① CO_2 & CO_3^{-2}

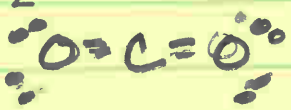
i)

CO_2 +1

C 1x4 = 4

O 2x6 = 12

16 ve



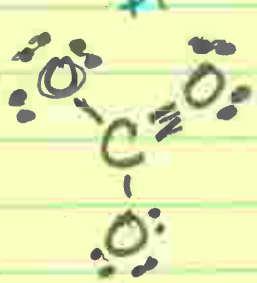
CO_3^{-2} +1

C 1x4 = 4

O 3x6 = 18

-2 = 2

24 ve



ii)

CO_2 has double Bonds, while CO_3^{-2} has Resonance

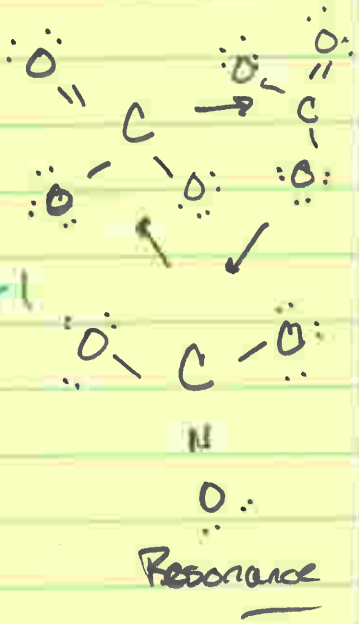
∴ the Double Bonds in CO_2 are Shorter

can just say this

* The carbon-oxygen Bond length is greater in the Resonance forms than in Double Bonds

+1

or



Resonance

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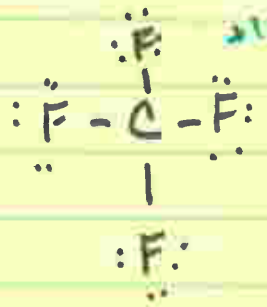
1)

(B)

i) CF_4

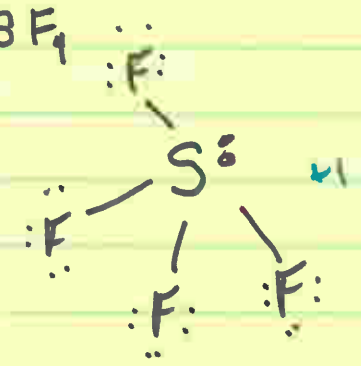
C 1×4 = 4
F 4×7 = 28
32 ve



+1

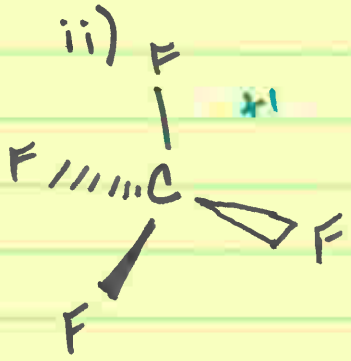
SF_4

S 1×6 = 6
F 4×7 = 28
34 ve



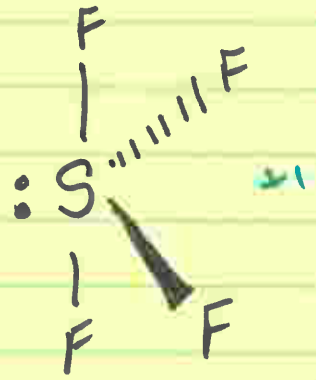
+1

ii)



+1

Shape +1 this...



+1

(5 Bonding Sites)

CF_4 has tetrahedral geometry, so the Bond Dipoles cancel

∴ Nonpolar molecule

+1

SF_4 w/ 5 pairs around Central S Atom, SF_4 is Trigonal Bipyramidal geometry, with lone pair

+1

The Bond dipoles do not cancel (Due to lone pair)

∴ molecule is polar

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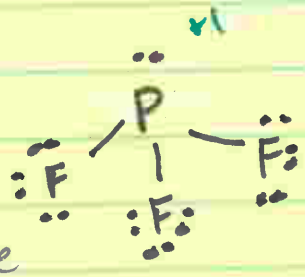
2) PF_3 PF_5

A)



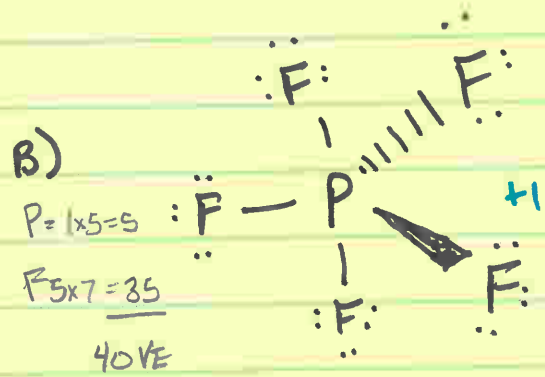
$P_{1\times5=5}$

$F_{3\times7=21}$

26 Ve

Trigonal pyramidal +1

B)



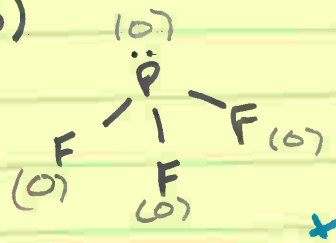
$P_{=1\times5=5}$

$F_{5\times7=35}$

40 VE

+1 Trigonal bipyramidal

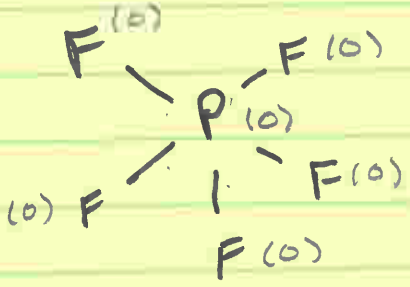
B)



$P = 5-(3+2)=0$

$F\ 7-(1+6)=0$

$FC = \emptyset$ +1



$P\ 5-(5+0)=0$

$F\ 7-(1+6)=0$

$FC=\emptyset$ +1

c) The PF_3 molecule is polar, due too the lone pair on central Atom +1

PF_5 is Nonpolar, due to the 5 F-P Bond dipoles do cancel +1 +1