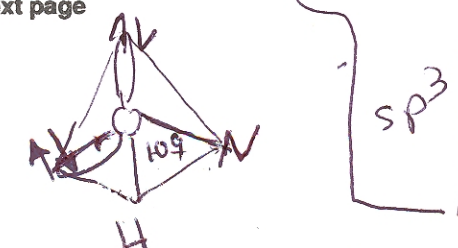
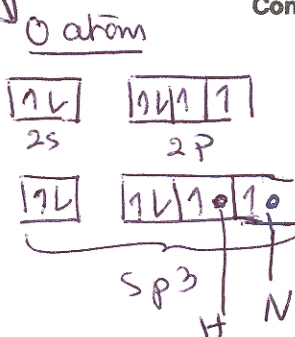


1) Give the valence bond description using VB theory for the molecules given below: (36 points)

	Lewis Structure	Electron box Diagram	Draw and Name Geometry of Stereoactive groups of electrons	Type of Hybrid Orbitals
BrF ₅				sp ³ d ²
C ₂ Cl ₂ (Cl is chlorine)				sp
HNO ₂ HONO				sp ²

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	Lewis Structure	Electron box Diagram	Draw and Name Geometry of Stereoactive groups of electrons	Type of Hybrid Orbitals
TeF ₄		<p>5s: $\uparrow\downarrow$ 5p: $\uparrow\downarrow \uparrow$ 5d: $\uparrow\downarrow \uparrow\downarrow \uparrow\downarrow$</p>	<p>trigonal bipyramidal</p>	sp ³ d
HCN	$H \cdot C \begin{matrix} \times \\ \times \\ \times \end{matrix} N \times$	<p>2s: $\uparrow\downarrow$ 2p: $\uparrow\downarrow \uparrow$</p> <p>2s: $\uparrow\downarrow$ 2p: $\uparrow\downarrow \uparrow\downarrow$</p>	<p>linear</p>	sp
XeF ₄		<p>5s: $\uparrow\downarrow$ 5p: $\uparrow\downarrow \uparrow\downarrow \uparrow\downarrow$ 5d: $\uparrow\downarrow \uparrow\downarrow \uparrow\downarrow$</p> <p>5s: $\uparrow\downarrow$ 5p: $\uparrow\downarrow \uparrow\downarrow \uparrow\downarrow$ 5d: $\uparrow\downarrow \uparrow\downarrow \uparrow\downarrow$</p>	<p>octahedral</p>	sp ³ d ²