

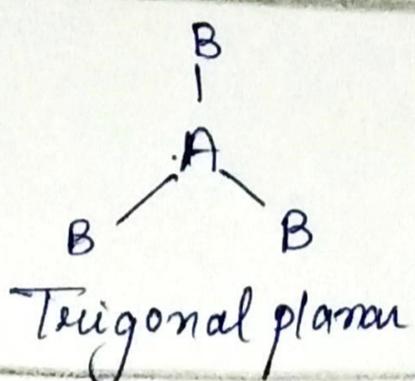
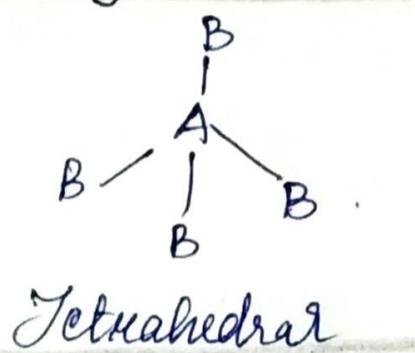
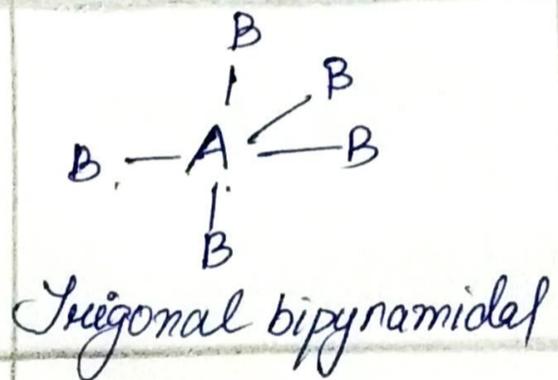
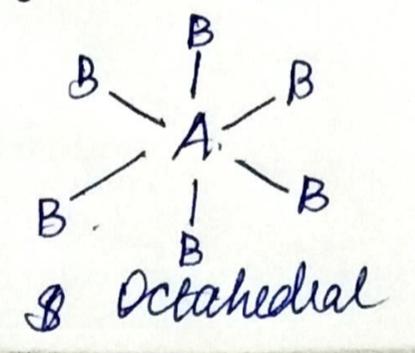
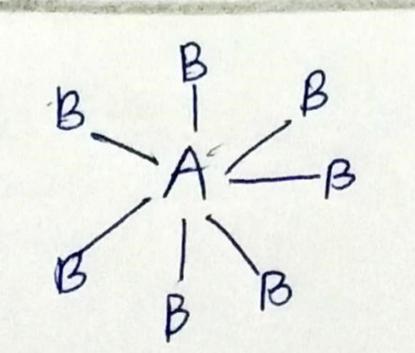
# Valence Shell Electron Pair Repulsion Theory [VSEPR]

- Lewis concept failed to explain the shape of molecules, so this theory provides a simple procedure to predict the shapes of covalent molecules.

The main postulates of VSEPR theory are as follows:-

- 1.) The shape of molecules depends upon the number of valence shell electron pairs around the central atom.
- 2.) These pairs of electrons tend to occupy such positions in space that minimise repulsion and thus maximise distance between them.
- 3.) ~~Order~~ A multiple bond is treated as if it is a single electron pair and the two or three electron pairs of a multiple bond are treated as a single super pair.
- 4.) The repulsive interaction of electron pairs order:-  
$$\text{L.P} - \text{L.P} (\text{lone pair}) > \text{L.P} (\text{lone pair}) - \text{B.P} (\text{bond pair})$$
$$> \text{B.P} (\text{bond pair}) - \text{B.P}$$

Possible cases of geometry :-

Cases	Geometry	Bond angle	Example
1. $AB_2$	$B-A-B$ Linear	$180^\circ$	$CO_2, BeCl_2$
2. $AB_3$	 Trigonal planar	$120^\circ$	$BF_3$
3. $AB_4$	 Tetrahedral	$109^\circ 28'$	$CH_4$
4. $AB_5$	 Trigonal bipyramidal	$120^\circ, 180^\circ, 90^\circ$	$PCl_5$
5. $AB_6$	 Octahedral	$90^\circ, 180^\circ$	$SF_6$
6. $AB_7$	 Pentagonal Bipyramidal	$72^\circ, 90^\circ, 180^\circ$	$IF_7$