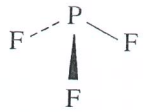
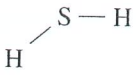
VSEPR Worksheet

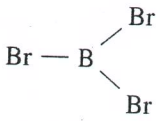
1. VSEPR is an acronym for valence shell electron pair repulsion — a theory that predicts molecular shape by assuming that repulsion between all pairs of electrons in the valence shell of an atom controls the direction of those pairs formed by bonding, and thus determines the shapes of molecules.

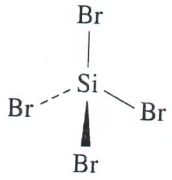
2.

(a) I — Be — I linear

(b)  pyramidal

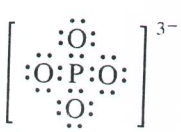
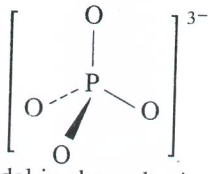
(c)  V-shape

(d)  trigonal planar

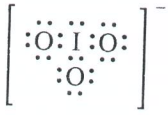
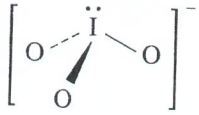
(e)  tetrahedral

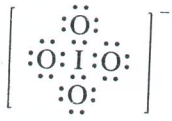
(f) H — Cl linear

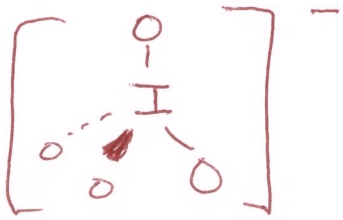
3. (a) PO_4^{3-} will be tetrahedral in shape because it has four bond pairs around the P atom.

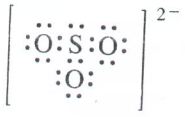



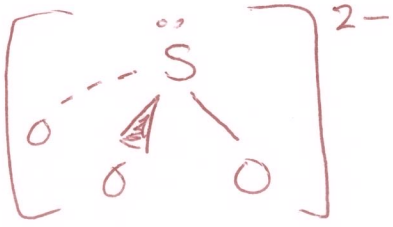
(b) IO_3^- will be pyramidal in shape, having three bond pairs and one lone pair around the I atom.

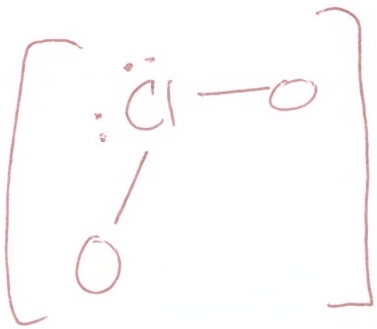
(c)  tetrahedral



(d)  pyramidal



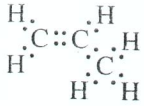
(e)  V-shape

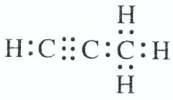


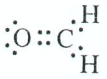
4.

(a)  linear

(b)  linear

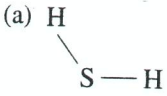
(c)  trigonal planar – 1st 2 carbons
tetrahedral – 3rd carbon

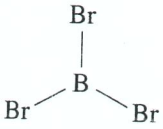
(d)  linear – 1st 2 carbons
tetrahedral – 3rd carbon

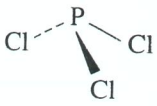
(e)  trigonal planar

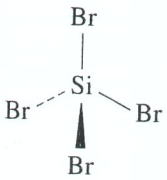
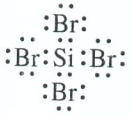
(f)  linear

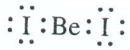
5.

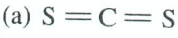
(a)  V-shape 

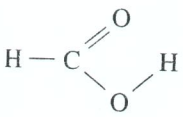
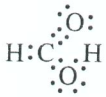
(b)  trigonal planar 

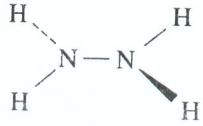
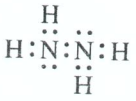
(c)  pyramidal 

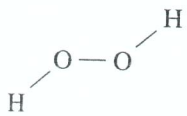
(d)  tetrahedral 

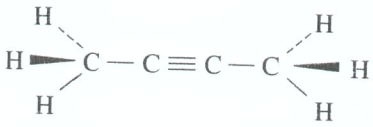
(e)  linear 

(a)  linear 

(b)  linear (C)
V-shape (O) 

(c)  pyramidal
(both Ns) 

(d)  V-shape
(both Os) 

(e)  

linear (central Cs)
tetrahedral (end Cs)