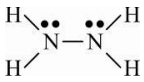
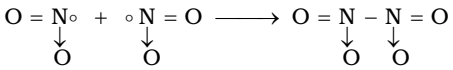
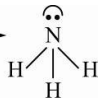
31.(C) 

32.(D) Structure of NO_2

 It has one unpaired electron. $\therefore$ It is paramagnetic

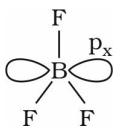
Also 
(Dimagnetic)

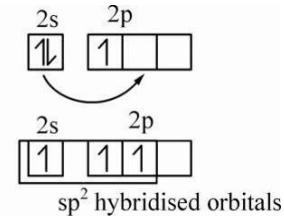
33.(C) $AlF_4^- \longrightarrow$ hybridisation of Al is sp^3

34.(D) Structure of NH_3 

BF_3 : B $1s^2 2s^2 2p^1$

The vacant p_x outermost shell orbital lies perpendicular to the plane.





sp^2 hybridised orbitals

(A) $\rightarrow \mu_{net}$ of $BF_3 = 0$ (C) $\rightarrow NH_3$ pyramidal in shape

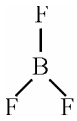
35.(B) Alkali and Alkaline earth metals form ionic bonds with non-metals.

36.(C) It depends on the electronegativity difference. (Electronegative difference between C and F is maximum)

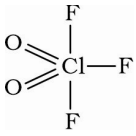
37.(C) Bond length decreases with increase in s-character as s-orbital is smaller than p-orbital.

$\underset{sp^3}{C_2H_6}$, $\underset{sp}{C_2H_2}$, $\underset{sp^2}{C_2H_4}$, $\underset{sp^2}{C_2H_2Br_2}$

(least s-character)

38.(D)  Trigonal planar structure $\mu_{net} = 0$

39.(A) Bond Length $\propto \dfrac{1}{\text{Bond Order}}$

40.(C) 

sp^3d hybridisation

41.(C) Triple bond has the max-value of bond energy.

42.(B) Structure of NO_2^+ is $[O = N = O]^+$

43.(A) $:\ddot{B}rF_3$ $2\ell p + 3bp = sp^3d$ $\Rightarrow$ It will have T-Shape

44.(B) $BH_3 \rightarrow sp^2$ Trigonal planar

$CH_3^- \rightarrow sp^3$ Pyramidal

$CH_3^+ \rightarrow sp^2$ Trigonal planar

$SO_4^{2-} \rightarrow sp^3$ Tetrahedral

45.(D) $CH_2 = CH - CH_2 - C \equiv CH$

1 2 3 4 5

sp^2 sp^3