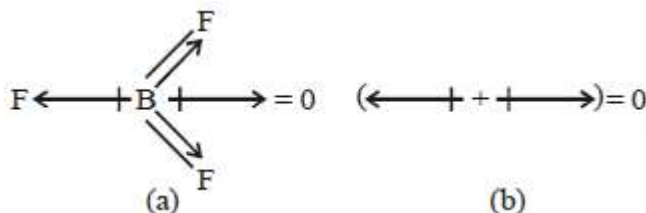


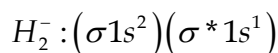
CHEMISTRY

51. (3) $B.O = \frac{1}{2}[N_b - N_a] = 0$; cannot exist
52. (2)
53. (2) Both assertion and reason are true but reason is not the correct explanation of assertion. BF_3 is sp^2 hybridized. Dipole moment is a vector quantity. The three bond moments give a net sum of zero, as the resultant of any two is equal and opposite to the third.



54. (4) Assertion is false but reason is true. CH_2Cl_2 is polar while CCl_4 is non-polar because in CCl_4 net dipole moment cancels.
55. (4) $H_2^+ : (\sigma 1s^1)$

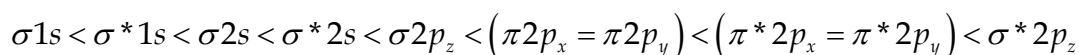
$$\text{Bond order} = \frac{1}{2}(1 - 0) = \frac{1}{2}$$



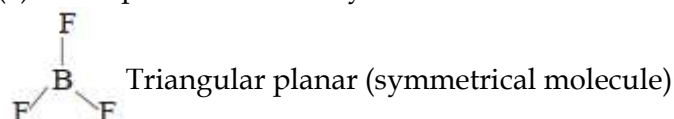
$$\text{Bond Order} = \frac{1}{2}(2 - 1) = \frac{1}{2}$$

The bond order of H_2^+ and H_2^- are same but H_2^+ is more stable than H_2^- . In H_2^- the antibonding orbital is filled with 1 electron so this causes instability.

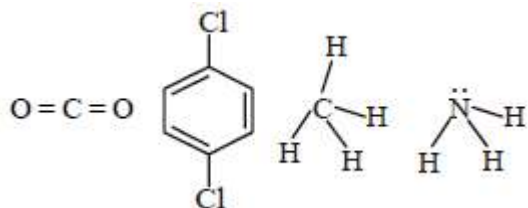
56. (4) $N_b < N_a$ or $N_a = N_b$
i.e., a negative or zero bond order corresponds to an unstable molecule.
57. (4) For oxygen correct increasing order is



58. (3) The dipole moment of symmetrical molecules is zero.



59. (3) Dipole moment is a vector quantity, hence the dipole moment of symmetrical molecules is zero. As CO_2 , *p*-dichlorobenzene and CH_4 have regular symmetrical shape. Hence $\mu = 0$



However, NH_3 has distorted structure due to presence of lone pair of electrons on N atom and thus has definite dipole moment.

i.e., sp^3 hybridisation and tetrahedral shape.

60. (1)