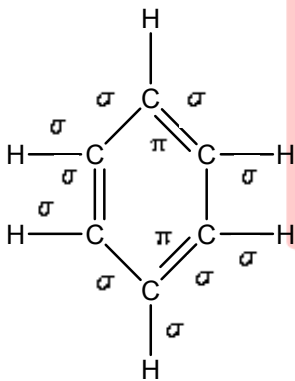
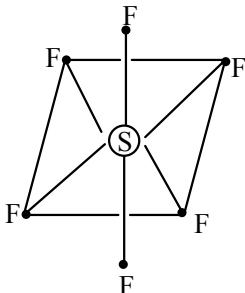


Topic :- Chemical Bonding and Molecular Structure

- 1 (b)
B has only six electron in B_2H_6 .
- 2 (a)
Like gets dissolved in like. It is theory.
- 3 (c)
Ionic compounds are good conductor of electricity in molten or in solution state. However, they are bad-conductor in solid state.
- 4 (d)
In benzene 12 σ and 3 π bonds are present. The structure of benzene is
- 
- 5 (c)
In CO_3^{2-} ion the C-atom undergoes sp^2 -hybridisation. It has triangular planar structure. While BF_4^- , NH_4^+ and SO_4^{2-} have tetrahedral structure.
- 6 (d)
 PCl_5 has trigonal bipyramid geometry.
- 7 (b)
 SF_6 has octahedral geometry, sp^3d^2 hybridisation and bond angle is 90°



$$\begin{aligned} \text{\% of } d\text{-character} &= \frac{2 (\text{no. of } d\text{-orbitals})}{6(\text{total hybridised orbitals})} \times 100 \\ &= 33\% \end{aligned}$$

So, SF_6 are bond angle = 90°
and d -character = 33%.

8

(a)
Head on overlapping give rise to σ -bond formation.

9

(c)
Allene is $\text{CH}_2 = \text{C} = \text{CH}_2$.

10

(a)
Silicate ion (SiO_4^{4-}) is the basic structural unit of silicates. Silicates are metal derivatives of silicic acid.

11

(a)
Due to planar equilateral geometry of graphite.

12

(a)
Due to non-availability of d -orbitals, boron cannot expand its octet. Therefore, the maximum covalence of boron cannot exceed 4.

13

(b)
Cations are always shorter than their parent atom, anion are always larger.

15

(a)
H-bonding is weakest bonding.

16

(a)
5 of P + 24 of O + 3 of -ve charge = 32.

17

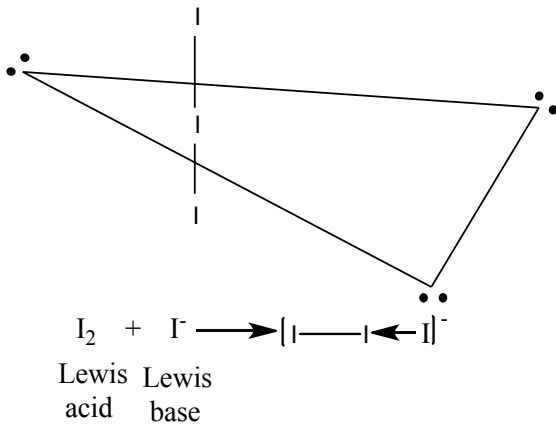
(c)
Benzene has 12σ - and 3π -bonds.

18

(c)
 PF_5 involves sp^3d -hybridization.

19

(b)
 I_3^- ion is made up of an I_2 molecule with an I^- bonded to it by means of a coordinate bond in which I_2 is lone pair acceptor (Lewis acid) and I^- the lone pair donor (Lewis base). There are two bond pairs and three lone pairs in the outer shell of central atom. To minimize the repulsive forces the three lone pairs occupy the equatorial position. The ion is therefore, linear in shape with a bond angle of exactly 180° .



Similarly, N_3^- ion is also linear in shape.

20

(c)

According to M.O. theory, bond order of N_2 , N_2^- and N_2^{2-} are 3, 2.5 and 2 respectively.

PE

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	B	A	C	D	C	D	B	A	C	A
Q.	11	12	13	14	15	16	17	18	19	20
A.	A	A	B	D	A	A	C	C	B	C

PE