DPP No: 08

SYLLABUS : Periodic Table & Chemical Bonding

1. The ONO angle is maximum in :

(A) HNO_3 (B) NO_2^+ (C) HNO_2 (D) NO_2

2. Decreasing order of C — C length in : I. C_2H_4, II. C_2H_2, III. C_6H_6, IV. C_2H_6 is :

(A) IV > III > I > II (B) I > II > IV > III (C) II > I > IV > III (D) IV > I > III > II

3. Consider the following molecules ; H_2O H_2S H_2Se H_2Te

I II III IV

Arrange these molecules in increasing order of bond angles.

(A) I < II < III < IV (B) IV < III < II < I

(C) I < II < IV < III (D) II < IV < III < I

4. Which of the following gives correct arrangement of compounds based on their bond strength?

(A) HF > HCl > HBr > HI (B) HI > HBr > HCl > HF

(C) HF > HBr > HCl > HI (D) HCl > HF > HBr > HI

5. In which of the following central atom is unhybridised?

(A) $S(CH_3)_2$ (B) SO_2

(C) SiH_4 (D) PCl_3

6. Which of the following contains a coordinate covalent bond

(A) HNO_3 (B) $BaCl_2$

(C) HCl (D) H_2O

7. Co-ordiante compounds are formed by :

(A) transfer of electrons (B) sharing of electrons

(C) donation of electron pair (D) none of these

8. For B_2H_6

S_1 : Each boron is sp^3 hybridised

S_2 : four terminal 'H' & two 'B' atom are in same plane but two bridge hydrogen in different plane.

S_3 : It has 4 σ bond & 2 bridge bond

S_4 : 8 σ bonds are present in it

(A) T T F F (B) T T T F (C) F F T F (D) F T F T

9. The specie which does not contain an odd number of valence electrons and is diamagnetic:

(A) O_2 (B) NO_2 (C) ClO_2 (D) N_2O_4

10. Find out the similarities between I_2Cl_6 and Al_2Cl_6 :

(A) Both have 3C — $4e^-$

(B) Both have sp^3-hybridisation for the central atom

(C) Both are non-planar (D) All are correct

11. Which is not true about B_2H_6

(A) Both 'B' atoms are sp^3 hybridised

(B) Boron atom is in ground state

(C) Two hydrogens occupy special positions

(D) There are two, three centre two electron bonds

12. For BF_3 molecule which of the following is true ?

(A) B-atom is sp^2 hybridised.

(B) There is a $p\pi$–$p\pi$ back bonding in this molecule.

(C) Observed B–F bond length is found to be less than the expected bond length.

(D) All of these

13. Respective order of strength of back-bonding and Lewis acidic strength in boron trihalides is:

(A) $BF_3 < BCl_3 < BBr_3$ and $BF_3 < BCl_3 < BBr_3$

(B) $BF_3 > BCl_3 > BBr_3$ and $BF_3 > BCl_3 > BBr_3$

(C) $BF_3 > BCl_3 > BBr_3$ and $BF_3 < BCl_3 < BBr_3$

(D) $BF_3 < BCl_3 < BBr_3$ and $BF_3 > BCl_3 > BBr_3$

14. For BF_3 molecule which of the following will not be true

(A) It has less bond length than BF_4^-

(B) It has less bond length than the compound $[NH_3 \rightarrow BF_3]$

(C) It's bond strength is increased because of $p\pi$–$d\pi$ back bonding

(D) It forms BF_4^- when hydrolysed in water.

15. The no. of S-O-S bonds in the trimer of SO_3 is

(A) 1 (B) 2 (C) 3 (D) None

16. Which of the following species do not contain S–S linkage?

(A) $H_2S_2O_5$ (B) $H_2S_2O_7$ (C) $H_2S_2O_3$ (D) $H_2S_4O_6$

17. Which statement is **incorrect** about pyrosilicate ion.

(A) sp^3 hybridisation

(B) One oxygen atom is shared between two tetrahydron

(C) there are eight Si–O bond

(D) There is one Si-Si bond

18. $Si_6O_{18}^{12-}$ unit is an example of :

(A) 3D silicate (B) double chain silicate

(C) cyclic silicate (D) 2D silicate

19. Paramagnetism of oxygen is explained on the basis of its following electronic configuration :

(A) $(2\pi\ p_y)^1\ (2\pi\ p_z)^1$ (B) $(2\pi\ p_x)^1\ (2\pi\ p_z)^1$ (C) $(2\sigma\ p_y)^1\ (2\pi\ p_y)^1$ (D) $(2\sigma\ p_y)^1\ (2\pi\ p_y)^1$

20. Bond order is a concept in the molecular orbital theory. It depends on the number of electrons in the bonding and antibonding orbitals. Which of the following statements is true about it ? The bond order

(A) Can have a negative quantity (B) Has always an integral value

(C) Can assume any positive or integral or fractional value including zero

(D) Is a non zero quantity

21. Which of the following pairs have identical values of bond order ?

(A) N_2^+ and O_2^+ (B) F_2 and Ne_2 (C) O_2 and B_2 (D) C_2 and N_2

22. Which of the following molecules/ions exhibit sp mixing?

(A) B_2 (B) C_2^{2-} (C) O_2^+ (D) Both (A) and (B)

23. The common features of the species N_2^{2-} , O_2 and NO^- are :

(A) bond order three and isoelectronic. (B) bond order two and isoelectronic.

(C) bond order three but not isoelectronic. (D) bond order two but not isoelectronic.

Integer Value Quetions.

24. How many compounds violate octet rule ?

CO_2 , PCl_5 , SiF_4 , BrF_5 , IF_7 , PCl_3 , H_2SO_4 , BF_3

25. Types of N–O bondlengths are present in HNO_3, NO_3^- are respectively X and Y then X + Y is. ?

ANSWER KEY

1.	**(B)**	**2.**	**(A)**	**3.**	**(B)**	**4.**	**(A)**	**5.**	**(A)**	**6.**	**(A)**	**7.**	**(C)**
8.	**(B)**	**9.**	**(D)**	**10.**	**(A)**	**11.**	**(B)**	**12.**	**(D)**	**13.**	**(C)**	**14.**	**(C)**
15.	**(C)**	**16.**	**(B)**	**17.**	**(D)**	**18.**	**(C)**	**19.**	**(B)**	**20.**	**(C)**	**21.**	**(A)**
22.	**(D)**	**23.**	**(B)**	**24.**	**5**	**25.**	**(3)**						