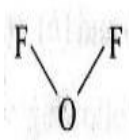
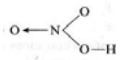
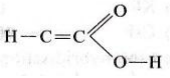
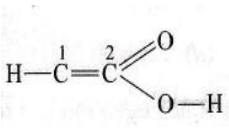
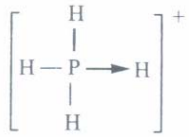
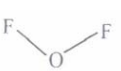
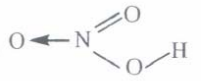
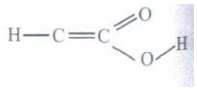
NEET CHEMISTRY PRACITCE PAPER

Time : 60 Mins **3 CHEMICAL BONDING AND MOLECULAR STRUCTURE 1** **Marks : 200**

1. Which of the following compounds shows maximum hydrogen bonding?
   a) HF b) H_2O c) NH_3 d) CH_3OH
2. A) Tetracyanoethene B) Carbon dioxide C) Benzene D) 1,3-buta-di-ene. Ratio of σ and π bonds is in order
   a) A= B < C < D b) A= B < D < C c) A= B = C = D d) C < D
3. Which of the following molecules\ions does not contain unpaired electrons?
   a) N_2^+ b) O_2 c) O_2^{2-} d) B_2
4. Bond order of N_2^+, N_2^- and N_2 will be
   a) 2.5,2.5 and 3 respectively b) 2, 2.5 and 3 respectively c) 3,2.5 and 3 respectively
   d) 2.5,2.5 and 2.5 respectively
5. Bond order of 1.5 is shown by
   a) O_2^+ b) O_2^- c) O_2^{2-} d) O_2
6. Which of the following is a polar molecule?
   a) BF_3 b) SF_4 c) SiF_4 d) XeF_4
7. Metallic lustre is explained by
   a) diffusion of metal ions b) oscillation of loose electrons c) excitation of free protons
   d) existence of bee lattice
8. Which of the following is a linear molecule?
   a) N_2O b) SO_2 c) CO_2 d) H_2S
9. Which of the following statement is not correct for sigma and pi-bonds formed between two carbon atoms?
   a) A sigma bond is stronger than a pi-bond. b) Bond energies of sigma and pi-bonds are of the same order.
   c) Free rotation of atoms about a sigma bond is allowed but not in case of a pi-bond.
   d)
   Asigma bond determines the direction between carbon atoms, but a pi-bond has no primary effect in this regard.
10. Which one of the following formulae does not correctly represent the bonding capacities of the atoms involved?
    a)  b)  c)  d) 
11. In a regular octahedral molecule, MX6 the number of X-M-X bonds at 180° is:
    a) three b) two c) six d) four
12. Which of the following molecules is paramagnetic in nature?
    a) H_2 b) Li_2 c) B_2 d) N_2
13. The pair of species with the same bond order is:
    a) O_2^-, B_2 b) O_2^+, NO^+ c) NO,CO d) N_2,O_2
14. Which of the following species is paramagnetic?
    a) O_2^{2-} b) NO c) CO d) CN^-
15. Be^{2+} is isoelectronic with which of the following ions?
    a) H^+ b) Li^+ c) Na^+ d) Mg^{2+}

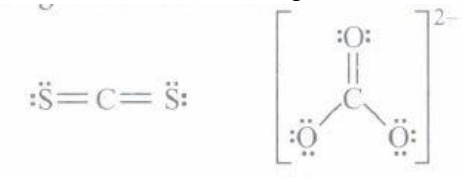
16. Among the following groups which represents the collection of isoelectronic species?
    a) NO, CN^-, N_2, O_2^- b) NO^+,C_2^{2-}, O_2^-, CO c) N_2, C_2^{2-}, CO, NO d) CO, NO^+, CN^-, C_2^{2-}
17. In which of the following pair both the species have sp^3 hybridisation?
    a) H_2S, BF_3 b) SiF_4, BeH_2 c) NF_3, H_2O d) NF_3, BF_3
18. As the s-character of a hybrid orbital increases the bond angle
    a) Increases b) Decreases c) does not change d) Becomes zero
19. Which of the following has strongest bond?
    a) HF b) HCl c) HBr d) HI
20. The correct sequence of bond length in single bond, double bond and triple bond of C is:
    a) (C - C) = (C = C) = (C ≡ C) b) C ≡C < C = C < C - C c) C - C < C = C < C ≡C
    d) C =C < C ≡C < C - C
21. Two elements X and Y combine to form a compound XY. Under what conditions the bond formed between them will be ionic?
    a) If the difference in electronegativities of X and Y is 1.7.
    b) If the difference in electronegativities of X and Y is more than 1.7.
    c) If the difference in electronegativities of X and Y is less than 1.7.
    d) If both X and Yare highly electronegative.
22. The most stable shape of ClF_3 is shown by

    a) (i) only b) (i) and (iii) c) (ii) only d) (iii) only
23. Which formulae does not correctly represents the bonding capacity of the atom involved?

a)  b)  c)  d) 

24. Which of the following molecules has trigonal planer geometry?
    a) BF_3 b) NH_3 c) PCl_3 d) IF_3
25. Which of the following has $p_\pi - d_\pi$ bonding
    a) NO_3^- b) SO_3^{2-} c) BO_3^{3-} d) CO_3^{2-}
26. Which one of the following is not paramagnetic?
    a) NO b) N_2^+ c) CO d) O_2^-
27. Which of the following species has a linear shape?
    a) SO_2 b) NO_2^+ c) O_3 d) NO_2^-
28. In a covalent bond formation:
    a) transfer of electrons takes place b) Sharing of electrons between two atoms takes place
    c) electrons are shared by one atom only d) electrons are donated by one atom and shared by both atoms
29. Select the correct relation:
    a) $\mu_{NH3} = \mu_{NF3}$ b) $\mu_{NH3} > \mu_{NF3}$ c) $\mu_{NH3} < \mu_{NF3}$ d) can't compared

30. What is the formal charge on carbon atom in the following two structures:



a) 0, -2 b) 0, 0 c) +2, -2 d) +1, -1

31. Match the column I with column II and mark the appropriate choice.

Column I		Column II	
(A)	C_2H_2	(i)	$sp3d^2$ hybridisation
(B)	SF_6	(ii)	sp^3d^3 hybridisation
(C)	SO_2	(iii)	sp hybridisation
(D)	IF_7	(iv)	sp^2 hybridisation

a) (A) ⟶ (i), (B) ⟶ (iii), (C) ⟶ (ii), (D) ⟶(iv) b) (A) ⟶(iii), (B)⟶(i), (C) ⟶(iv), (D) ⟶(ii)
c) (A)⟶(ii), (B) ⟶(iii), (C)⟶(i), (D) ⟶(iv) d) (A) ⟶(iv), (B) ⟶(i), (C) ⟶(iii), (D) ⟶(ii)

32. Which one shows maximum hydrogen bonding?
a) H_2O b) H_2Se c) H_2S d) HF

33. $CH_4(g) \rightarrow CH3(g) + H(g)$ $\triangle H1 = Q_3$ $CH3(g) \rightarrow CH_2(g) + H(g)$ $\triangle H_2 = Q_2$
$C_4(g) \rightarrow CH(g) + H(g)$ $\rightarrow H_3 = Q_3$ $CH(g) \rightarrow C(g) + H(g)$ $\rightarrow H_4 = Q_4$
Then the relationship between Q_1 Q_2 Q_3 and Q_4 are
a) $Q_1 > Q_2 > Q_3 > Q_4$ b) $Q_3 > Q_2 > Q_4 > Q_1$ c) $Q_3 > Q_2 > Q_1 > Q_4$ d) $Q_2 > Q_3 > Q_1 > Q_4$

34. The increasing order of energies of various molecular orbitals of N_2, is given below:
$\sigma 1\,\mathrm{s} < \sigma^* 1\,\mathrm{s} < \sigma 2\,\mathrm{s} < \sigma^* 2\,\mathrm{s} < \pi 2\mathrm{p_x} = \pi 2\mathrm{p_y} < \sigma 2\mathrm{p_z} < \pi^* 2\mathrm{p_x} = \pi^* 2\mathrm{p_y} < \sigma^* 2\mathrm{p_z}$
The above sequence is not true for the molecule:
a) C_2 b) B_2 c) O_2 d) Be_2

35. When two ice cubes are pressed over each other and unite to form one cube. Which force is responsible for holding them together?
a) Vander waal's forces b) Covalent attraction c) Hydrogen bond formation d) Dipole-dipole attraction

36. Which one of the following compounds shows the presence of intramolecular hydrogen bond?
a) H_2O_2 b) HCN c) Cellulose d) Concentrated acetic acid

37. Among the following which species has same number of σ and π bonds?
a) C_7H_8 b) C_2CN_4 c) C_2H_4 d) HC == CH

38. What is the correct dipole moment of NH_3 and NF_3 respectively?
a) 4.90×10^{-30} cm and 0.80×10^{-30} cm b) 0.80×10^{-30} cm and 4.90×10^{-30} cm
c) 4.90×10^{-30} cm and 4.90×10^{-30} cm d) 0.80×10^{-30} cm and 0.80×10^{-30} cm

39. Main axis of a diatomic molecule is z, molecular orbital p_x and p_y overlap to form which of the following orbital?
a) δ-molecular orbital b) No bond will be formed c) π-molecular orbital d) σ- molecular orbital

40. The electronegativity difference between N and F is greater than that between N and H yet the dipole moment of NH_3(1.5 D) is larger than that of NF_3 (0.2D). This is because
a)
in NH_3 the atomic dipole and bond dipole are in the same direction whereas in NF_3 these are in opposite directions
b) in NH_3 as well as NF_3 the atomic dipole and bond dipole are in opposite directions

c)

in NH_3 the atomic dipole and bond dipole are in the opposite directions whereas in NF_3 these are in the same direction

d) in NH_3 as well as in NF_3 the atomic dipole and bond dipole are in the same direction

41. Maximum bond angle at nitrogen is present in which of the following?
    a) NO_2^+ b) NO_3^- c) NO_2 d) NO_2^-
42. The correct nond order for CO and CO^+ are respectively :
    a) 3, 5/2 b) 3, 2 c) 3, 7/2 d) 4/2, 3
43. The molecule which does not exhibit dipole moment is
    a) NH_3 b) $CHCl_3$ c) H_2O d) CCL_4
44. A pair of electrons present between two identical non-metals
    a) is shifted to one of the atoms b) is shared equally between them c) undergoes addition reactions
    d) have same spin.
45. Which of the following molecule does not have a linear arrangement of atoms?
    a) H_2S b) C_2H_2 c) BeH_2 d) CO_2
46. In allene structure, three carbon atoms are joined by:
    a) Three σ- and three π-bond b) two σ- and one π - bond c) two σ - and two π - bonds
    d) three π - bonds only
47. The correct stability order for N_2 and its given ions is:
    a) $N_2 > N_2^+ > N_2^- > N_2^{2-}$ b) $N_2^- > N_2^+ > N_2 > N_2$ c) $N_2^+ > N_2^- > N_2 > N_2^{2-}$ d) $N_2 > N_2^+ = N_2^- > N_2^{2-}$
48. Which of the following set of molecules will have zero dipole moment?
    a) Boron trifluoride, beryllium difluoride, carbon dioxide, 1, 4-dichlorobenzene
    b) Ammonia, beryllium difluoride, water, 1, 4-dichloro- benzene
    c) Boron trifluride, hydrogen fluroide, carbon dioxide 1, 3-dichlorobenzene
    d) Nitrogen triflouride, beryllium difluride, water, 1, 3- dichlorobenzene
49. In the formation of SF_6 molecule, the sulphur atom is in
    a) first excited state b) second excited state c) third excited state d) fourth excited state
50. Which of the following does not apply to metallic bond?
    a) Overlapping valence orbitals b) Mobile valence electrons c) Delocalised electrons
    d) Highly directed bonds