

### AIPMT-2006

1. The number of unpaired electrons in a paramagnetic diatomic molecule of an element with atomic number 16 is  
(1) 1 (2) 2 (3) 3 (4) 4
2. Which of the following species has a linear shape:  
(1)  $O_3$  (2)  $NO_2^-$  (3)  $SO_2$  (4)  $NO_2^+$
3. Which of the following is not isostructural with  $SiCl_4$ ?  
(1)  $NH_4^+$  (2)  $SCl_4$  (3)  $SO_4^{2-}$  (4)  $PO_4^{3-}$
4. 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  $NF_3$  (0.2 D). This is because  
(1) in  $NH_3$  the atomic dipole and bond dipole are in the opposite directions whereas in  $NF_3$  these are in the same direction  
(2) in  $NH_3$  as well as in  $NF_3$  the atomic dipole and bond dipole are in the same direction  
(3) in  $NH_3$  the atomic dipole and bond dipole are in the same direction whereas in  $NF_3$  these are in opposite directions  
(4) in  $NH_3$  as well as in  $NF_3$  the atomic dipole and bond dipole are in opposite directions
5. In which of the following molecules are all the bonds **not** equal :-  
(1)  $NF_3$  (2)  $ClF_3$   
(3)  $BF_3$  (4)  $AlF_3$

### AIPMT-2007

6. The correct order of increasing thermal stability of  $K_2CO_3$ ,  $MgCO_3$ ,  $CaCO_3$  and  $BeCO_3$  is  
(1)  $BeCO_3 < MgCO_3 < CaCO_3 < K_2CO_3$   
(2)  $MgCO_3 < BeCO_3 < CaCO_3 < K_2CO_3$   
(3)  $K_2CO_3 < MgCO_3 < CaCO_3 < BeCO_3$   
(4)  $BeCO_3 < MgCO_3 < K_2CO_3 < CaCO_3$
7. In which of the following pairs the two species are iso-structural  
(1)  $SO_3^{2-}$  and  $NO_3^-$  (2)  $BF_3$  and  $NF_3$   
(3)  $BrO_3^-$  and  $XeO_3$  (4)  $SF_4$  and  $XeF_4$

8. The correct order of C–O bond length among  $CO$ ,  $CO_3^{2-}$ ,  $CO_2$  is  
(1)  $CO < CO_3^{2-} < CO_2$   
(2)  $CO_3^{2-} < CO_2 < CO$   
(3)  $CO < CO_2 < CO_3^{2-}$   
(4)  $CO_2 < CO < CO_3^{2-}$
9. In which of the following hydration energy is higher than lattice energy  
(1)  $MgSO_4$  (2)  $CaSO_4$   
(3)  $BaSO_4$  (4)  $SrSO_4$
10. Which one of the following orders correctly represents the increasing acid strengths of the given acids :  
(1)  $HOCIO_3 < HOCIO_2 < HOCIO < HOCl$   
(2)  $HOCl < HOCIO < HOCIO_2 < HOCIO_3$   
(3)  $HOCIO < HOCl < HOCIO_3 < HOCIO_2$   
(4)  $HOCIO_2 < HOCIO_3 < HOCIO < HOCl$

### AIPMT-2008

11. Four diatomic species are listed below in different sequences. Which of these presents the correct order of their increasing bond order :  
(1)  $C_2^{2-} < He_2^+ < NO < O_2^-$   
(2)  $He_2^+ < O_2^- < NO < C_2^{2-}$   
(3)  $O_2^- < NO < C_2^{2-} < He_2^+$   
(4)  $NO < C_2^{2-} < O_2^- < He_2^+$
12. The angular shape of ozone molecule ( $O_3$ ) consists of  
(1) 1 sigma and 1 pi bonds  
(2) 2 sigma and 1 pi bonds  
(3) 1 sigma and 2 pi bonds  
(4) 2 sigma and 2 pi bonds
13. The correct order of increasing bond angles in the following triatomic species is:-  
(1)  $NO_2^+ < NO_2 < NO_2^-$  (2)  $NO_2^+ < NO_2^- < NO_2$   
(3)  $NO_2^- < NO_2^+ < NO_2$  (4)  $NO_2^- < NO_2 < NO_2^+$

### AIPMT-2009

14. In which of the following molecules/ions  $\text{BF}_3$ ,  $\text{NO}_2^-$ ,  $\text{NH}_2^-$  and  $\text{H}_2\text{O}$ , the central atom is  $\text{sp}^2$  hybridized :  
(1)  $\text{BF}_3$  and  $\text{NO}_2^-$  (2)  $\text{NO}_2^-$  and  $\text{NH}_2^-$   
(3)  $\text{NH}_2^-$  and  $\text{H}_2\text{O}$  (4)  $\text{NO}_2^-$  and  $\text{H}_2\text{O}$
15. According to MO theory which of the following lists ranks the nitrogen species in terms of increasing bond order :  
(1)  $\text{N}_2^- < \text{N}_2^{2-} < \text{N}_2$  (2)  $\text{N}_2^- < \text{N}_2 < \text{N}_2^{2-}$   
(3)  $\text{N}_2^{2-} < \text{N}_2^- < \text{N}_2$  (4)  $\text{N}_2 < \text{N}_2^{2-} < \text{N}_2^-$
16. In the case of alkali metals, the covalent character decreases in the order :  
(1)  $\text{MI} > \text{MBr} > \text{MCl} > \text{MF}$   
(2)  $\text{MCl} > \text{MI} > \text{MBr} > \text{MF}$   
(3)  $\text{MF} > \text{MCl} > \text{MBr} > \text{MI}$   
(4)  $\text{MF} > \text{MCl} > \text{MI} > \text{MBr}$
17. What is the dominant intermolecular force or bond that must be overcome in converting liquid  $\text{CH}_3\text{OH}$  to a gas :  
(1) London or dispersion force  
(2) Hydrogen bonding  
(3) Dipole-dipole interaction  
(4) Covalent bonds

### AIPMT-2010

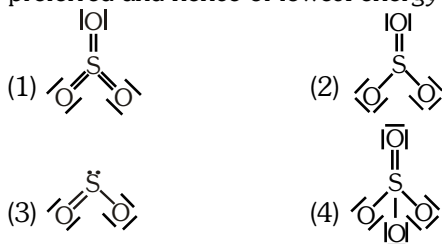
18. Some of the properties of the two species,  $\text{NO}_3^-$  and  $\text{H}_3\text{O}^+$  are described below. Which one of them is correct :-  
(1) Isostructural with same hybridization for the central atom.  
(2) Isostructural with different hybridization for the central atom.  
(3) Similar in hybridization for the central atom with different structures.  
(4) Dissimilar in hybridization for the central atom with different structures.
19. In which of the following molecules the central atom does not have  $\text{sp}^3$  hybridization :-  
(1)  $\text{SF}_4$  (2)  $\text{BF}_4^-$   
(3)  $\text{NH}_4^+$  (4)  $\text{CH}_4$
20. Which one of the following species does not exist under normal conditions :  
(1)  $\text{Li}_2$  (2)  $\text{Be}_2^+$   
(3)  $\text{Be}_2$  (4)  $\text{B}_2$

21. In which of the following pairs of molecules/ions, the central atoms have  $\text{sp}^2$  hybridization :  
(1)  $\text{BF}_3$  and  $\text{NH}_2^-$  (2)  $\text{NO}_2^-$  and  $\text{NH}_3$   
(3)  $\text{BF}_3$  and  $\text{NO}_2^-$  (4)  $\text{NH}_2^-$  and  $\text{H}_2\text{O}$
22. Which of the following alkaline earth metal sulphates has hydration enthalpy higher than the lattice enthalpy :  
(1)  $\text{SrSO}_4$  (2)  $\text{CaSO}_4$   
(3)  $\text{BeSO}_4$  (4)  $\text{BaSO}_4$
23. In which one of the following species the central atom has the type of hybridization which is not the same as that present in the other three :  
(1)  $\text{PCl}_5$  (2)  $\text{SF}_4$   
(3)  $\text{I}_3^-$  (4)  $\text{SbCl}_5^{2-}$
24. Property of the alkaline earth metals that increases with their atomic number :-  
(1) Electronegativity  
(2) Solubility of their hydroxides in water  
(3) Solubility of their sulphates in water  
(4) Ionization energy

### AIPMT Pre-2011

25. Considering the state of hybridization of carbon atoms, find out the molecule among the following which is linear :  
(1)  $\text{CH}_3-\text{CH}=\text{CH}-\text{CH}_3$   
(2)  $\text{CH}_3-\text{C}\equiv\text{C}-\text{CH}_3$   
(3)  $\text{CH}_2=\text{CH}-\text{CH}_2-\text{C}\equiv\text{CH}$   
(4)  $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_3$
26. Which of the following has the minimum bond length :  
(1)  $\text{O}_2^+$  (2)  $\text{O}_2^-$  (3)  $\text{O}_2^{2-}$  (4)  $\text{O}_2$
27. Which of the two ions from the list given below that have the geometry that is explained by the same hybridization of orbitals,  $\text{NO}_2^-$ ,  $\text{NO}_3^-$ ,  $\text{NH}_2^-$ ,  $\text{NH}_4^+$ ,  $\text{SCN}^-$  :  
(1)  $\text{NO}_2^-$  and  $\text{NO}_3^-$  (2)  $\text{NH}_4^+$  and  $\text{NO}_3^-$   
(3)  $\text{SCN}^-$  and  $\text{NH}_2^-$  (4)  $\text{NO}_2^-$  and  $\text{NH}_2^-$
28. Which of the following compounds has the lowest melting point :  
(1)  $\text{CaCl}_2$  (2)  $\text{CaBr}_2$   
(3)  $\text{CaI}_2$  (4)  $\text{CaF}_2$

29. Which of the following structures is the most preferred and hence of lowest energy for  $\text{SO}_3$  :



### AIPMT Pre-2012

30. Which one of the following pairs is isostructural (i.e. having the same shape and hybridization) :
- (1)  $[\text{NF}_3]$  and  $[\text{BF}_3]$  (2)  $[\text{BF}_4^-]$  and  $[\text{NH}_4^+]$
- (3)  $[\text{BCl}_3]$  and  $[\text{BrCl}_3]$  (4)  $[\text{NH}_3]$  and  $[\text{NO}_3^-]$
31. Which of the following species contains three bond pairs and one lone pair around the central atom:
- (1)  $\text{NH}_2^-$  (2)  $\text{PCl}_3$  (3)  $\text{H}_2\text{O}$  (4)  $\text{BF}_3$
32. The pair of species with the same bond order is:
- (1)  $\text{NO}$ ,  $\text{CO}$  (2)  $\text{N}_2$ ,  $\text{O}_2$
- (3)  $\text{O}_2^{2-}$ ,  $\text{B}_2$  (4)  $\text{O}_2^+$ ,  $\text{NO}^+$
33. Bond order of 1.5 is shown by:
- (1)  $\text{O}_2^{2-}$  (2)  $\text{O}_2$  (3)  $\text{O}_2^+$  (4)  $\text{O}_2^-$

### AIPMT Mains-2012

34. During change of  $\text{O}_2$  to  $\text{O}_2^-$  ion, the electron adds on which one of the following orbitals :
- (1)  $\sigma^*$  orbital (2)  $\sigma$  orbital
- (3)  $\pi^*$  orbital (4)  $\pi$  orbital
35. Four diatomic species are listed below. Identify the correct order in which the bond order is increasing in them :
- (1)  $\text{C}_2^{2-} < \text{He}_2^+ < \text{O}_2^- < \text{NO}$
- (2)  $\text{He}_2^+ < \text{O}_2^- < \text{NO} < \text{C}_2^{2-}$
- (3)  $\text{NO} < \text{O}_2^- < \text{C}_2^{2-} < \text{He}_2^+$
- (4)  $\text{O}_2^- < \text{NO} < \text{C}_2^{2-} < \text{He}_2^+$

### NEET-UG-2013

36. Which one of the following molecules contains no  $\pi$  bond :
- (1)  $\text{NO}_2$  (2)  $\text{CO}_2$  (3)  $\text{H}_2\text{O}$  (4)  $\text{SO}_2$

37.  $\text{XeF}_2$  is isostructural with :-
- (1)  $\text{BaCl}_2$  (2)  $\text{TeF}_2$  (3)  $\text{ICl}_2^-$  (4)  $\text{SbCl}_3$

38. Dipole induced dipole interactions are present in which of the following pairs :-

- (1)  $\text{SiF}_4$  and He atoms (2)  $\text{H}_2\text{O}$  and alcohol
- (3)  $\text{Cl}_2$  and  $\text{CCl}_4$  (4)  $\text{HCl}$  and He atoms

39. Which of the following is a polar molecule :

- (1)  $\text{XeF}_4$  (2)  $\text{BF}_3$  (3)  $\text{SF}_4$  (4)  $\text{SiF}_4$

40. Which of the following is paramagnetic :

- (1)  $\text{NO}^+$  (2)  $\text{CO}$  (3)  $\text{O}_2^-$  (4)  $\text{CN}^-$

41. Identify the correct order of solubility in aqueous medium :

- (1)  $\text{Na}_2\text{S} > \text{ZnS} > \text{CuS}$  (2)  $\text{CuS} > \text{ZnS} > \text{Na}_2\text{S}$
- (3)  $\text{ZnS} > \text{Na}_2\text{S} > \text{CuS}$  (4)  $\text{Na}_2\text{S} < \text{CuS} > \text{ZnS}$

### AIPMT-2014

42. Which of the following molecules has the maximum dipole moment :

- (1)  $\text{CO}_2$  (2)  $\text{CH}_4$  (3)  $\text{NH}_3$  (4)  $\text{NF}_3$

43. Which one of the following species has plane triangular shape :

- (1)  $\text{N}_3^-$  (2)  $\text{NO}_3^-$  (3)  $\text{NO}_2^-$  (4)  $\text{CO}_2$

### AIPMT-2015

44. The correct bond order in the following species is:-

- (1)  $\text{O}_2^{2+} < \text{O}_2^- < \text{O}_2^+$  (2)  $\text{O}_2^+ < \text{O}_2^- < \text{O}_2^{2+}$
- (3)  $\text{O}_2^- < \text{O}_2^+ < \text{O}_2^{2+}$  (4)  $\text{O}_2^{2+} < \text{O}_2^+ < \text{O}_2^-$

45. Which of the following pairs of ions are isoelectronic and isostructural :

- (1)  $\text{ClO}_3^-$ ,  $\text{CO}_3^{2-}$  (2)  $\text{SO}_3^{2-}$ ,  $\text{NO}_3^-$
- (3)  $\text{ClO}_3^-$ ,  $\text{SO}_3^{2-}$  (4)  $\text{CO}_3^{2-}$ ,  $\text{SO}_3^{2-}$

46. Which of the following options represents the correct bond order :

- (1)  $\text{O}_2^- < \text{O}_2 < \text{O}_2^+$
- (2)  $\text{O}_2^- > \text{O}_2 < \text{O}_2^+$
- (3)  $\text{O}_2^- < \text{O}_2 > \text{O}_2^+$
- (4)  $\text{O}_2^- > \text{O}_2 > \text{O}_2^+$

47. Solubility of the alkaline earth's metal sulphates in water decreases in the sequence :-

- (1)  $\text{Ca} > \text{Sr} > \text{Ba} > \text{Mg}$
- (2)  $\text{Sr} > \text{Ca} > \text{Mg} > \text{Ba}$
- (3)  $\text{Ba} > \text{Mg} > \text{Sr} > \text{Ca}$
- (4)  $\text{Mg} > \text{Ca} > \text{Sr} > \text{Ba}$

48. Maximum bond angle at nitrogen is present in which of the following :

- (1)  $\text{NO}_2^-$
- (2)  $\text{NO}_2^+$
- (3)  $\text{NO}_3^-$
- (4)  $\text{NO}_2$

### RE-AIPMT-2015

49. On heating which of the following releases  $\text{CO}_2$  most easily :

- (1)  $\text{MgCO}_3$
- (2)  $\text{CaCO}_3$
- (3)  $\text{K}_2\text{CO}_3$
- (4)  $\text{Na}_2\text{CO}_3$

50. Decreasing order of stability of  $\text{O}_2$ ,  $\text{O}_2^-$ ,  $\text{O}_2^+$  and  $\text{O}_2^{2-}$  is :-

- (1)  $\text{O}_2 > \text{O}_2^+ > \text{O}_2^{2-} > \text{O}_2^-$
- (2)  $\text{O}_2^- > \text{O}_2^{2-} > \text{O}_2^+ > \text{O}_2$
- (3)  $\text{O}_2^+ > \text{O}_2 > \text{O}_2^- > \text{O}_2^{2-}$
- (4)  $\text{O}_2^{2-} > \text{O}_2^- > \text{O}_2 > \text{O}_2^+$

51. In which of the following pairs, both the species are not isostructural :

- (1)  $\text{NH}_3$ ,  $\text{PH}_3$
- (2)  $\text{XeF}_4$ ,  $\text{XeO}_4$
- (3)  $\text{SiCl}_4$ ,  $\text{PCl}_4^+$
- (4) Diamond, silicon carbide

52. The variation of the boiling points of the hydrogen halides is in the order  $\text{HF} > \text{HI} > \text{HBr} > \text{HCl}$ .

What explains the higher boiling point of hydrogen fluoride ?

- (1) The bond energy of HF molecules is greater than in other hydrogen halides
- (2) The effect of nuclear shielding is much reduced in fluorine which polarises the HF molecule
- (3) The electronegativity of fluorine is much higher than for other elements in the group.
- (4) There is strong hydrogen bonding between HF molecules

### NEET-I 2016

53. Consider the molecules  $\text{CH}_4$ ,  $\text{NH}_3$  and  $\text{H}_2\text{O}$ . Which of the given statements is false ?

- (1) The H-C-H bond angle in  $\text{CH}_4$ , the H-N-H bond angle in  $\text{NH}_3$ , and the H-O-H bond angle in  $\text{H}_2\text{O}$  are all greater than  $90^\circ$
- (2) The H-O-H bond angle in  $\text{H}_2\text{O}$  is larger than the H-C-H bond angle in  $\text{CH}_4$ .
- (3) The H-O-H bond angle in  $\text{H}_2\text{O}$  is smaller than the H-N-H bond angle in  $\text{NH}_3$ .
- (4) The H-C-H bond angle in  $\text{CH}_4$  is larger than the H-N-H bond angle in  $\text{NH}_3$ .

54. Which one of the following orders is correct for the bond dissociation enthalpy of halogen molecules?

- (1)  $\text{I}_2 > \text{Br}_2 > \text{Cl}_2 > \text{F}_2$
- (2)  $\text{Cl}_2 > \text{Br}_2 > \text{F}_2 > \text{I}_2$
- (3)  $\text{Br}_2 > \text{I}_2 > \text{F}_2 > \text{Cl}_2$
- (4)  $\text{F}_2 > \text{Cl}_2 > \text{Br}_2 > \text{I}_2$

55. Predict the correct order among the following :-

- (1) lone pair - lone pair > lone pair - bond pair > bond pair - bond pair
- (2) lone pair - lone pair > bond pair - bond pair > lone pair - bond pair
- (3) bond pair - bond pair > lone pair - bond pair > lone pair - lone pair
- (4) lone pair - bond pair > bond pair - bond pair > lone pair - lone pair

56. Match the compounds given in column I with the hybridisation and shape given in column II and mark the **correct** option.

Column-I		Column-II	
(a)	$\text{XeF}_6$	(i)	Distorted octahedral
(b)	$\text{XeO}_3$	(ii)	Square planar
(c)	$\text{XeOF}_4$	(iii)	pyramidal
(d)	$\text{XeF}_4$	(iv)	Square pyramidal

Code :-

- |     | (a)  | (b)   | (c)  | (d)   |
|-----|------|-------|------|-------|
| (1) | (i)  | (iii) | (iv) | (ii)  |
| (2) | (i)  | (ii)  | (iv) | (iii) |
| (3) | (iv) | (iii) | (i)  | (ii)  |
| (4) | (iv) | (i)   | (ii) | (iii) |

### NEET-II 2016

57. The correct geometry and hybridization for  $\text{XeF}_4$  are:
- (1) Planar triangle,  $\text{sp}^3\text{d}^3$
  - (2) square planar,  $\text{sp}^3\text{d}^2$
  - (3) octahedral,  $\text{sp}^3\text{d}^2$
  - (4) trigonal bipyramidal,  $\text{sp}^3\text{d}$
58. Among the following which one is a wrong statement?
- (1)  $\text{SeF}_4$  and  $\text{CH}_4$  have same shape
  - (2)  $\text{I}_3^+$  has bent geometry
  - (3)  $\text{PH}_5$  and  $\text{BiCl}_5$  do not exist
  - (4)  $\text{p}\pi\text{-d}\pi$  bonds are present in  $\text{SO}_2$
59. The hybridizations of atomic orbitals of nitrogen in and respectively are
- (1)  $\text{sp}$ ,  $\text{sp}^2$  and  $\text{sp}^3$
  - (2)  $\text{sp}^2$ ,  $\text{sp}$  and  $\text{sp}^3$
  - (3)  $\text{sp}$ ,  $\text{sp}^3$  and  $\text{sp}^2$
  - (4)  $\text{sp}^2$ ,  $\text{sp}^3$  and  $\text{sp}$
60. Which of the following fluoro-compounds is most likely to behave as a Lewis base ?
- (1)  $\text{CF}_4$
  - (2)  $\text{SiF}_4$
  - (3)  $\text{BF}_3$
  - (4)  $\text{PF}_3$
61. Which of the following pairs of ions is isoelectronic and isostructural ?
- (1)  $\text{SO}_3^{2-}$ ,  $\text{NO}_3^-$
  - (2)  $\text{ClO}_3^-$ ,  $\text{SO}_3^{2-}$
  - (3)  $\text{CO}_3^{2-}$ ,  $\text{NO}_3^-$
  - (4)  $\text{ClO}_3^-$ ,  $\text{CO}_3^{2-}$

### NEET(UG) 2017

62. Ionic mobility of which of the following alkali metal ions is lowest when aqueous solution of their salts are put under an electric field ?
- (1) K
  - (2) Rb
  - (3) Li
  - (4) Na

63. Match the interhalogen compounds of column-I with the geometry in column II and assign the correct code.

Column-I		Column-II	
(a)	$\text{XX}'$	(i)	T-shape
(b)	$\text{XX}'_3$	(ii)	Pentagonal bipyramidal
(c)	$\text{XX}'_5$	(iii)	Linear
(d)	$\text{XX}'_7$	(iv)	Square-Pyramidal
		(v)	Tetrahedral

Code :

(a)	(b)	(c)	(d)
(1) (iii)	(i)	(iv)	(ii)
(2) (v)	(iv)	(iii)	(ii)
(3) (iv)	(iii)	(ii)	(i)
(4) (iii)	(iv)	(i)	(ii)

64. Which of the following pairs of compounds is isoelectronic and isostructural ?
- (1)  $\text{TeI}_2$ ,  $\text{XeF}_2$
  - (2)  $\text{IBr}_2^-$ ,  $\text{XeF}_2$
  - (3)  $\text{IF}_3$ ,  $\text{XeF}_2$
  - (4)  $\text{BeCl}_2$ ,  $\text{XeF}_2$
65. The species, having bond angles of  $120^\circ$  is :-
- (1)  $\text{ClF}_3$
  - (2)  $\text{NCl}_3$
  - (3)  $\text{BCl}_3$
  - (4)  $\text{PH}_3$
66. Which of the following pairs of species have the same bond order ?
- (1)  $\text{O}_2$ ,  $\text{NO}^+$
  - (2)  $\text{CN}^-$ ,  $\text{CO}$
  - (3)  $\text{N}_2$ ,  $\text{O}_2^-$
  - (4)  $\text{CO}$ ,  $\text{NO}$

### NEET(UG) 2018

67. Among  $\text{CaH}_2$ ,  $\text{BeH}_2$ ,  $\text{BaH}_2$ , the order of ionic character is
- (1)  $\text{BeH}_2 < \text{CaH}_2 < \text{BaH}_2$
  - (2)  $\text{CaH}_2 < \text{BeH}_2 < \text{BaH}_2$
  - (3)  $\text{BeH}_2 < \text{BaH}_2 < \text{CaH}_2$
  - (4)  $\text{BaH}_2 < \text{BeH}_2 < \text{CaH}_2$

- 68.** Magnesium reacts with an element (X) to form an ionic compound. If the ground state electronic configuration of (X) is  $1s^2 2s^2 2p^3$ , the simplest formula for this compound is  
 (1)  $Mg_2X_3$  (2)  $MgX_2$   
 (3)  $Mg_2X$  (4)  $Mg_3X_2$
- 69.** Consider the following species:  
 $CN^+$ ,  $CN^-$ ,  $NO$  and  $CN$   
 Which one of these will have the highest bond order?  
 (1)  $NO$  (2)  $CN^-$   
 (3)  $CN^+$  (4)  $CN$
- 70.** Which one of the following elements is unable to form  $MF_6^{3-}$  ion?  
 (1) Ga (2) Al (3) B (4) In
- 71.** In the structure of  $ClF_3$ , the number of lone pairs of electrons on central atom 'Cl' is  
 (1) one (2) two  
 (3) four (4) three
- NEET(UG) 2019**
- 72.** The number of sigma ( $\sigma$ ) and pi ( $\pi$ ) bonds in pent-2-en-4-yne is :-  
 (1) 10  $\sigma$  bonds and 3  $\pi$  bonds  
 (2) 8  $\sigma$  bonds and 5  $\pi$  bonds  
 (3) 11  $\sigma$  bonds and 2  $\pi$  bonds  
 (4) 13  $\sigma$  bonds and no  $\pi$  bond
- 73.** Which of the following diatomic molecular species has only  $\pi$  bonds according to Molecular Orbital Theory?  
 (1)  $O_2$  (2)  $N_2$   
 (3)  $C_2$  (4)  $Be_2$
- 74.** Which of the following species is **not** stable?  
 (1)  $[SiF_6]^{2-}$   
 (2)  $[GeCl_6]^{2-}$   
 (3)  $[Sn(OH)_6]^{2-}$   
 (4)  $[SiCl_6]^{2-}$
- 75.** Identify the **incorrect** statement related to  $PCl_5$  from the following :-  
 (1) Three equatorial P-Cl bonds make an angle of  $120^\circ$  with each other  
 (2) Two axial P-Cl bonds make an angle of  $180^\circ$  with each other  
 (3) Axial P-Cl bonds are longer than equatorial P-Cl bonds  
 (4)  $PCl_5$  molecule is non-reactive
- 76.** Match the Xenon compounds in **Column-I** with its structure in **Column-II** and assign the **correct** code:-
- | <b>Column-I</b> | <b>Column-II</b>           |
|-----------------|----------------------------|
| (a) $XeF_4$     | (i) pyramidal              |
| (b) $XeF_6$     | (ii) square planar         |
| (c) $XeOF_4$    | (iii) distorted octahedral |
| (d) $XeO_3$     | (iv) square pyramidal      |
- Code :**
- | <b>(a)</b> | <b>(b)</b> | <b>(c)</b> | <b>(d)</b> |
|------------|------------|------------|------------|
| (1) (i)    | (ii)       | (iii)      | (iv)       |
| (2) (ii)   | (iii)      | (iv)       | (i)        |
| (3) (ii)   | (iii)      | (i)        | (iv)       |
| (4) (iii)  | (iv)       | (i)        | (ii)       |
- 77.** Which is the **correct** thermal stability order for  $H_2E$  ( $E=O, S, Se, Te$  and  $Po$ )?  
 (1)  $H_2S < H_2O < H_2Se < H_2Te < H_2Po$   
 (2)  $H_2O < H_2S < H_2Se < H_2Te < H_2Po$   
 (3)  $H_2Po < H_2Te < H_2Se < H_2S < H_2O$   
 (4)  $H_2Se < H_2Te < H_2Po < H_2O < H_2S$
- NEET(UG) 2019 (ODISHA)**
- 78.** Which of the following is paramagnetic?  
 (1)  $N_2$  (2)  $H_2$   
 (3)  $Li_2$  (4)  $O_2$

79. Which of the following is the correct order of dipole moment ?

- (1)  $\text{NH}_3 < \text{BF}_3 < \text{NF}_3 < \text{H}_2\text{O}$
- (2)  $\text{BF}_3 < \text{NF}_3 < \text{NH}_3 < \text{H}_2\text{O}$
- (3)  $\text{BF}_3 < \text{NH}_3 < \text{NF}_3 < \text{H}_2\text{O}$
- (4)  $\text{H}_2\text{O} < \text{NF}_3 < \text{NH}_3 < \text{BF}_3$

80. The number of hydrogen bonded water molecule(s) associated with  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  is :-

- (1) 3
- (2) 1
- (3) 2
- (4) 5

### NEET(UG) 2020

81. Identify a molecule which does not exist.

- (1)  $\text{O}_2$
- (2)  $\text{He}_2$
- (3)  $\text{Li}_2$
- (4)  $\text{C}_2$

82. Which of the following set of molecules will have zero dipole moment ?

- (1) Boron trifluoride, beryllium difluoride, carbon dioxide, 1,4-dichlorobenzene
- (2) Ammonia, beryllium difluoride, water, 1,4-dichlorobenzene
- (3) Boron trifluoride, hydrogen fluoride, carbon dioxide, 1,3-dichlorobenzene
- (4) Nitrogen trifluoride, beryllium difluoride, water, 1,3-dichlorobenzene

### NEET(UG) 2020(COVID-19)

83. Among the compounds shown below which one revealed a linear structure ?

- (1)  $\text{NO}_2$
- (2)  $\text{HOCl}$
- (3)  $\text{O}_3$
- (4)  $\text{N}_2\text{O}$

84. Match the compounds of Xe in column I with the molecular structure in column II.

Column-I	Column-II
(a) $\text{XeF}_2$	(i) Square planar
(b) $\text{XeF}_4$	(ii) Linear
(c) $\text{XeO}_3$	(iii) Square pyramidal
(d) $\text{XeOF}_4$	(iv) Pyramidal
(1) (a)-(ii) (b)-(i) (c)-(iii) (d)-(iv)	
(2) (a)-(ii) (b)-(iv) (c)-(iii) (d)-(i)	
(3) (a)-(ii) (b)-(iii) (c)-(i) (d)-(iv)	
(4) (a)-(ii) (b)-(i) (c)-(iv) (d)-(iii)	

85. Match the coordination number and type of hybridisation with distribution of hybrid orbitals in space based on Valence bond theory.

Coordination number and type of hybridisation	Distribution of hybrid orbitals in space
(a) 4, $\text{sp}^3$	(i) trigonal bipyramidal
(b) 4, $\text{dsp}^2$	(ii) octahedral
(c) 5, $\text{sp}^3\text{d}$	(iii) tetrahedral
(d) 6, $\text{d}^2\text{sp}^3$	(iv) square planar

Select the correct option :

- (1) (a)-(ii) (b)-(iii) (c)-(iv) (d)-(i)
- (2) (a)-(iii) (b)-(iv) (c)-(i) (d)-(ii)
- (3) (a)-(iv) (b)-(i) (c)-(ii) (d)-(iii)
- (4) (a)-(iii) (b)-(i) (c)-(iv) (d)-(ii)

86. Identify the wrongly matched pair.

Molecule	Shape or geometry of molecule
(1) $\text{PCl}_5$	Trigonal planar
(2) $\text{SF}_6$	Octahedral
(3) $\text{BeCl}_2$	Linear
(4) $\text{NH}_3$	Trigonal pyramidal

- 

$$\begin{array}{ll} (1) (b-a) & (2) \frac{(c-a)}{2} \\ (3) \frac{(b-a)}{2} & (4) (c-a) \end{array}$$

**88.**  $\text{BF}_3$  is planar and electron deficient compound. Hybridization and number of electrons around the central atom, respectively are:

(1)  $\text{sp}^3$  and 4                      (2)  $\text{sp}^3$  and 6  
(3)  $\text{sp}^2$  and 6                      (4)  $\text{sp}^2$  and 8

- | <b>List-I</b>      | <b>List-II</b>            |
|--------------------|---------------------------|
| (a) $\text{PCl}_5$ | (i) Square pyramidal      |
| (b) $\text{SF}_6$  | (ii) Trigonal planar      |
| (c) $\text{BrF}_5$ | (iii) Octahedral          |
| (d) $\text{BF}_3$  | (iv) Trigonal bipyramidal |

- (1) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)
- (2) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
- (3) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
- (4) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

- |      |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Que. | 1   | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 |
| Ans. | 2   | 4  | 2  | 3  | 2  | 1  | 3  | 3  | 1  | 2  | 2  | 2  | 4  | 1  | 3  |
| Que. | 16  | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| Ans. | 1   | 2  | 4  | 1  | 3  | 3  | 3  | 4  | 2  | 2  | 1  | 1  | 3  | 1  | 2  |
| Que. | 31  | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 |
| Ans. | 2   | 3  | 4  | 3  | 2  | 3  | 3  | 4  | 3  | 3  | 1  | 3  | 2  | 3  | 3  |
| Que. | 46  | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| Ans. | 1   | 4  | 2  | 1  | 3  | 2  | 4  | 2  | 2  | 1  | 1  | 2  | 1  | 1  | 4  |
| Que. | 61  | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 |
| Ans. | 2,3 | 3  | 1  | 2  | 3  | 2  | 1  | 4  | 2  | 3  | 2  | 1  | 3  | 4  | 4  |
| Que. | 76  | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| Ans. | 2   | 3  | 4  | 2  | 2  | 2  | 1  | 4  | 4  | 2  | 1  | 3  | 3  | 1  | 3  |
| Que. | 91  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Ans. | 4   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |