

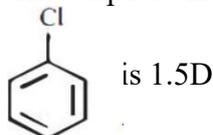
## CHEMISTRY

### Chemical Bonding

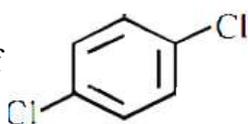
51. Which of the following is the correct increasing order of lone pair of electrons on the central atom?

- (1)  $\text{IF}_7 < \text{IF}_5 < \text{ClF}_3 < \text{XeF}_2$
- (2)  $\text{IF}_7 < \text{XeF}_2 < \text{ClF}_2 < \text{IF}_5$
- (3)  $\text{IF}_7 < \text{ClF}_3 < \text{XeF}_2 < \text{IF}_5$
- (4)  $\text{IF}_7 < \text{XeF}_2 < \text{IF}_5 < \text{ClF}_3$

52. The dipole moment of chlorobenzene



The dipole moment of



- (1) 2.86D
- (2) 2.25D
- (3) 1.5D
- (4) 0D

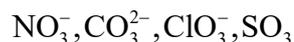
53. In compounds of type  $\text{ECl}_3$ , where  $\text{E} = \text{B}, \text{P}, \text{As}$  or  $\text{Bi}$ , the angles  $\text{Cl-E-Cl}$  for different  $\text{E}$  are in the order

- (1)  $\text{B} > \text{P} = \text{As} = \text{Bi}$
- (2)  $\text{B} > \text{P} > \text{As} > \text{Bi}$
- (3)  $\text{B} < \text{P} = \text{As} = \text{Bi}$
- (4)  $\text{B} < \text{P} < \text{As} < \text{Bi}$

54. Which of the following substances has the greatest ionic character?

- (1)  $\text{Cl}_2\text{O}$
- (2)  $\text{NCl}_3$
- (3)  $\text{PbCl}_2$
- (4)  $\text{BaCl}_2$

55. Which of the following are isoelectric and isostructural?



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

56. Bond order normally gives idea of stability of a molecular species. All the molecules viz.  $\text{H}_2$ ,  $\text{Li}_2$  and  $\text{B}_2$  have the same bond order yet they are not equally stable. Their stability order is

- (1)  $\text{H}_2 > \text{B}_2 > \text{Li}_2$
- (2)  $\text{Li}_2 > \text{H}_2 > \text{B}_2$
- (3)  $\text{Li}_2 > \text{B}_2 > \text{H}_2$
- (4)  $\text{H}_2 > \text{Li}_2 > \text{B}_2$

57. Hydrogen chloride molecule contains

- (1) polar covalent bond
- (2) double bond
- (3) co-ordinate bond
- (4) electrovalent bond

58. Among the following species, identify the isostructural pairs



- (1)  $[\text{NF}_3, \text{NO}_3^-]$  and  $[\text{BF}_3, \text{H}_3\text{O}^+]$
- (2)  $[\text{NF}_3, \text{HN}_3]$  and  $[\text{NO}_3^-, \text{BF}_3]$
- (3)  $[\text{NF}_3, \text{H}_3\text{O}^+]$  and  $[\text{NO}_3^-, \text{BF}_3]$
- (4)  $[\text{NF}_3, \text{H}_3\text{O}^+]$  and  $[\text{HN}_3, \text{BF}_3]$

59. In the anion  $\text{HCOO}^-$  the two carbon - oxygen bonds are found to be of equal length. What is the reason for it?

- (1) Electronic orbitals of carbon atom are hybridised
- (2) The  $\text{C} = \text{O}$  bond is weaker than the  $\text{C}-\text{O}$  bond
- (3) The anion  $\text{HCOO}^-$  has two resonating structures
- (4) The anion is obtained by removal of a proton from the acid molecule

60. Which of the following is/are not essential condition(s) for hybridisation?

- (i) The orbitals present in the valence shell of the central atom involves in hybridisation.

- (ii) The orbitals undergoing hybridisation should have similar/comparable energy
  - (iii) Promotion of electron is essential prior to hybridisation
  - (iv) Only half-filled orbitals participate in hybridisation
- (1) (i) only                      (2) (iii) only  
(3) (iv) only                      (4) (iii) and (iv)

