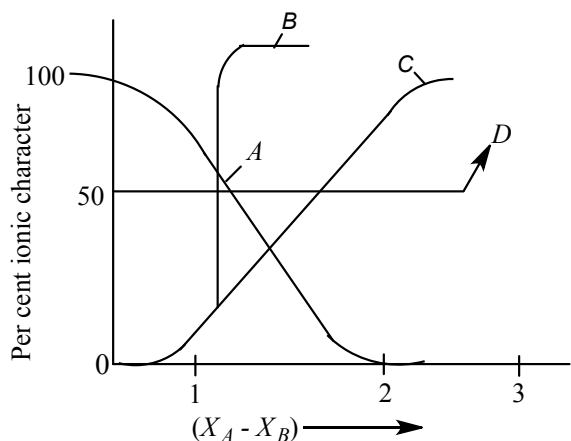


**Topic :- Chemical Bonding and Molecular Structure**

- Which among the following has highest ionic radius?  
a)  $F^-$                       b)  $B^{3+}$                       c)  $O^{2-}$                       d)  $Li^+$
- Zero dipole moment is possessed by  
a)  $PCl_3$                       b)  $BF_3$                       c)  $ClF_3$                       d)  $NH_3$
- The number of electrons involved in the bond formation of  $N_2$  molecule  
a) 2                              b) 4                              c) 6                              d) 10
- Which one of the following orders is not in accordance with the property stated against it?  
a)  $F_2 > Cl_2 > Br_2 > I_2$  : Electronegativity  
b)  $F_2 > Cl_2 > Br_2 > I_2$  : Bond dissociation energy  
c)  $F_2 > Cl_2 > Br_2 > I_2$  : Oxidising power  
d)  $HI > HBr > HCl > HF$  : Acidic property in water.
- What is the dominant intermolecular force or bond that must be overcome in converting liquid  $CH_3OH$  to a gas?  
a) London dispersion force  
b) Hydrogen bonding  
c) Dipole-dipole interaction  
d) Covalent bonds
- The incorrect statements regarding bonding molecular orbitals because:  
a) Bonding molecular orbitals possess less energy than combining atomic orbitals.  
b) Bonding molecular orbitals have low electron density between the two nuclei.  
c) Every electron in bonding molecular orbitals contributes to attraction between atoms.  
d) They are formed when the lobes of the combining atomic orbitals have same sign.
- A coordinate bond is a dative covalent bond. Which of the below is true?  
a) Three atoms form bond by sharing their electrons                      b) Two atoms form bond by sharing their electrons  
c) Two atoms form bond and one of them                      d) Two atoms form bond by sharing electrons

- provides both electrons obtained from third atom.
8. The bond length between C – C bond in  $sp^2$  hybridised molecule is  
a) 1.2 Å                      b) 1.39 Å                      c) 1.33 Å                      d) 1.54 Å
9. The electronegativity values of C, H, O, N and S are 2.5, 2.1, 3.5, 3.0 and 2.5 respectively. Which of the following bonds is most polar?  
a) C—H                      b) N—H                      c) S—H                      d) O—H
10. Which of the following has largest size?  
a) Al                      b)  $Al^+$                       c)  $Al^{2+}$                       d)  $Al^{3+}$
11. In which of the following, the bond length between hybridised carbon atom and other carbon atom is minimum?  
a) Propyne                      b) Propene                      c) Butane                      d) Propane
12. Which is expected to conduct electricity?  
a) Diamond                      b) Molten sulphur                      c) Molten KCl                      d) Crystalline NaCl
13. Metals are good conductors of electricity because they contain  
a) Ionic bonds                      b) A network structure  
c) Very few valence electrons                      d) Free electrons
14. The species having pyramidal shape is  
a)  $SO_3$                       b)  $BrF_3$                       c)  $SiO_3^{2-}$                       d)  $OSF_2$
15. The attraction that non-polar molecules have for each other is primarily caused by:  
a) Hydrogen bonding  
b) Difference in electronegativities  
c) High ionisation energy  
d) Van der Waals' forces
16. In HCHO carbon atom has hybridisation:  
a)  $sp$                       b)  $sp^2$                       c)  $sp^3$                       d) None of these
17. Which of the following species has four lone pairs of electrons in its outer shell?  
a) I                      b)  $O^-$                       c)  $Cl^-$                       d) He

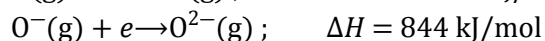
18. For  $AB$  bond if per cent ionic character is plotted against electronegativity difference ( $X_A - X_B$ ), the shape of the curve would look like



The correct curve is

- a)  $A$                       b)  $B$                       c)  $C$                       d)  $D$
19. Chlorine atom, in its third excited state, reacts with fluorine to form a compound  $X$ . The formula and shape of  $X$  are
- a)  $ClF_5$ , pentagonal  
 b)  $ClF_4$ , tetrahedral  
 c)  $ClF_4$ , pentagonal bipyramidal  
 d)  $ClF_7$ , pentagonal bipyramidal

20. The formation of the oxide ion  $O^{2-}(g)$  requires first an exothermic and then an endothermic step as shown below,



This is because:

- a)  $O^-$  ion has comparatively larger size than oxygen atom  
 b) Oxygen has high electron affinity  
 c)  $O^-$  ion will lead to resist the addition of another electron  
 d) Oxygen is more electronegative