

VSEPR Theory

1. The structure of $[Cu(H_2O)_4]^{++}$ ion is
 - (a) Square planar
 - (b) Tetrahedral
 - (c) Distorted rectangle
 - (d) Octahedral
2. The bond angle in PH_3 would be expected to be close to
 - (a) 90°
 - (b) 105°
 - (c) 109°
 - (d) 120°
3. In which molecule are all atoms coplanar
 - (a) O_2^+
 - (b) BF_3
 - (c) PF_3
 - (d) NH_3
4. Which has the least bond angle
 - (a) NH_3
 - (b) BeF_2
 - (c) H_2O
 - (d) CH_4
5. In compound X , all the bond angles are exactly $109^\circ 28'$, X is
 - (a) Chloromethane
 - (b) Iodoform
 - (c) Carbon tetrachloride
 - (d) Chloroform
6. The shape of SO_4^{2-} ion is
 - (a) Square planar
 - (b) Tetrahedral
7. Which of the following molecules has one lone pair of electrons on the central atom
 - (a) H_2O
 - (b) NH_3
 - (c) CH_4
 - (d) PCl_5
8. Of the following compounds, the one having a linear structure is
 - (a) NH_2
 - (b) CH_4
 - (c) C_2H_2
 - (d) H_2O
9. XeF_6 is
 - (a) Octahedral
 - (b) Distorted octahedral
 - (c) Planar
 - (d) Tetrahedral
10. Which has maximum bond angle
 - (a) CHF_3
 - (b) $CHCl_3$
 - (c) $CHBr_3$
 - (d) All have maximum bond angle
11. Of the following species the one having a square planar structure is
 - (a) NH_4^+
 - (b) BF_4^-
 - (c) XeF_4
 - (d) SCL_4



12. In which of the following is the angle between the two covalent bonds greatest
- (a) CO_2 (b) CH_4 (c) Molecular oxygen
 (d) Hydrogen peroxide
13. As the s-character of hybridized orbital decreases, the bond angle
- (a) Decreases (b) Increases (c) Both of these
 (d) None of these
14. XeF_2 molecule is
- (a) Linear (b) Triangular planar (c) Pyramidal
 (d) Square planar
15. Of the following sets which one does NOT contain isoelectronic species
- (a) $PO_4^{3-}, SO_4^{2-}, ClO_4^-$
 (b) CN^-, N_2, C_2^{2-}
 (c) $SO_3^{2-}, CO_3^{2-}, NO_3^-$
 (d) $BO_3^{3-}, CO_3^{2-}, NO_3^-$
16. A molecule which contains unpaired electrons is
- (a) Carbon monoxide
 (b) Molecular nitrogen
17. H_2O is
- (a) A linear triatomic molecule
 (b) A bent (angular) triatomic molecule
 (c) Both of these
 (d) None of these
18. Bond angle between two hybrid orbitals is 105° . % s-orbital character of hybrid orbital is
- (a) Between 20 – 21%
 (b) Between 19 – 20%
 (c) Between 21 – 22%
 (d) Between 22 – 23%
19. The bond angle between N_x in ice is closest to
- (a) $120^\circ 28'$ (b) 60°
 (c) 90° (d) 105°
20. Which of the following molecules does not have a linear arrangement of atoms
- (a) H_2S (b) C_2H_2
 (c) BeH_2 (d) CO_2

