



INDIAN SCHOOL DARSAIT
DEPARTMENT OF CHEMISTRY



Subject: Chemistry Topic: CHEMICAL BONDING AND MOLECULAR STRUCTURE:		
Resource Person: Jyothy Sukhadiya		Date : 30.08.17
Name of Student: _____		Class & Division: XI :
		Roll No:
1.	Draw the Lewis structures for the following molecules and ions: BeF ₂ , CO ₃ ²⁻ , H ₂ SO ₄	1 each
2.	a) What do you understand by formal charge of a molecule? b) Calculate the formal charges on all the atoms in : a) CO ₃ ²⁻ b) NO ₂ ⁻	3
3.	Define: (a) Lattice enthalpy (b) Bond length (c) Bond angle (d) Bond order (e) Dipole moment (f) Hybridisation.	1 each
4.	Explain the following limitations of octet rule giving examples: (a) Expanded octet (b) Odd electron molecule (c) Incomplete octet.	3
5.	Explain why BeH ₂ molecule has a zero dipole moment although the Be-H bonds are polar?	1
6.	Predict and draw the shapes of the following molecules using VSEPR theory: i) BF ₃ ii) NH ₃ iii) XeF ₄ iv) SF ₄ v) NH ₄ ⁺ vi) H ₂ O vii) BrF ₅	2
7.	Give reasons: (a) BF ₃ is non-polar whereas NF ₃ is polar. (b) He ₂ does not exist in nature.	2
8.	Although both CO ₂ and H ₂ O are tri atomic molecules, the shape of water molecule is bent while that of CO ₂ is linear.	2
9.	Give reasons: (a) Dipole moment of NH ₃ is more than that of NF ₃ . (b) BeCl ₂ has zero dipole moment while H ₂ O has net dipole moment.	2
10.	In SF ₄ molecule, the lone pair of electrons occupies equatorial position in preference to axial position. Why? What is the shape the molecule?	2
11.	Differentiate between : (a) Bond enthalpy and bond dissociation enthalpy. (b) Sigma bond and pi bond. (c) Bonding and anti-bonding molecular orbitals.	2 each
12.	Account for the following : (a) ClF ₃ is T-shaped. (b) Sigma bond is stronger than Pi-bond. (c) Oxygen is para magnetic.	1 each

	(d) Bonds in ozone are equivalent. (e) Acetic acid forms dimer. (f) Para nitro phenol has higher boiling point than ortho nitro phenol. (g) HF has a higher boiling point than HCl	
13.	Explain the formation of H ₂ molecule on the basis of valence bond theory. Also give the potential energy diagram.	3
14.	Using the concept of hybridization explain the structure of PCl ₅ and SF ₆ .	3
15.	Write the electronic configuration for O ₂ , O ₂ ⁻ and O ₂ ⁺ Calculate their bond order and indicate their magnetic properties and compare their stabilities.	3
16.	Using hybridization explain the formation of i) BeCl ₂ ii) BF ₃ iii) CH ₄ iv) NH ₃ v) H ₂ O	2 each
17.	Using hybridization explain the formation of (i) C ₂ H ₆ (ii) C ₂ H ₄ (iii) C ₂ H ₂ .	2 each
18.	Explain why N ₂ has greater bond dissociation energy than N ₂ ⁺ whereas O ₂ has lesser bond dissociation energy than O ₂ ⁺ ?	3
19.	Using the MOT write the electronic configuration of the following molecules: (a) He ₂ (b) Li ₂ (c) C ₂ (d) N ₂ (e) F ₂ Also determine their bond orders and magnetic nature.	2 each
20.	Explain the following terms using an example : (a) Intermolecular hydrogen bonding. (b) Intramolecular hydrogen bonding.	2
21	a) Explain resonance. b) Draw the resonating structures for the following : CO ₃ ²⁻ , NO ₃ ⁻ , SO ₂ , C ₆ H ₆	3