



INDIAN SCHOOL DARSAIT
DEPARTMENT OF CHEMISTRY



Subject : CHEMISTRY		Topic : Chemical Bonding and Molecular structure		Date of Worksheet: 8. 9.2019	
Resource Person: ROHITHA P N				Date of Submission : -----	
Name of the Student : _____			Class & Division : XI		Roll Number :-----
1	Why He ₂ molecule does not exist?				1
2	Although B-F bonds are polar, BF ₃ is a non-polar molecule. Explain.				1
3	O- Nitro phenol is lower in boiling point than p-nitro phenol. Why?				1
4	Although NH ₃ and H ₂ O are sp ³ hybridized, bond angle in water is less than NH ₃ . Why?				1
5	Explain why CO ₂ is linear while H ₂ O is angular in shape.				1
6	H ₂ S is a gas and H ₂ O is a liquid at room temperature. Why?				1
7	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
8	Explain the conditions for the formation of molecular orbitals from atomic orbital.				2
9	CO ₂ & H ₂ O are both triatomic molecules but dipole moment of CO ₂ is zero where as that of H ₂ O is 1.83D. Why?				2
10	Out of NH ₃ & NF ₃ which has higher dipole moment. Why?				2
11	What is meant by hybridization? Explain the hybridization of acetylene molecule.				3
12	Describe hybridization of PCl ₅ . Why is it more reactive?				3
13	Compare the stabilities of O ₂ , O ₂ ⁻ , O ₂ ⁺ , O ₂ ²⁻ and indicate their magnetic properties.				3
14	Define hydrogen bond. What are its types?				3
15	Explain Fajan's rule with suitable examples.				3
16.	Account for the following : (a) ClF ₃ is T-shaped. (b) Sigma bond is stronger than Pi-bond. (c) Oxygen is para magnetic. (d) Bonds in ozone are equivalent. (e) Acetic acid forms dimer. (g) HF has a higher boiling point than HCl.				1 each
17.	Explain the formation of H ₂ molecule on the basis of valence bond theory. Also give the potential energy diagram				3
18.	Differentiate between: (a) Bond enthalpy and bond dissociation enthalpy. (b) Sigma bond and pi bond. (c) Bonding and anti-bonding molecular orbitals.				1 each
19.	Explain why N ₂ has greater bond dissociation energy than N ₂ ⁺ whereas O ₂ has lesser bond dissociation energy than O ₂ ⁺ ?				3

20.	a) What is octet rule? b) Differentiate between ionic bond and covalent bond.	3																				
21.	Define the following a) bond length b) bond angle c) bond order	1 each																				
22.	a) Which of the following molecules is super octet (expanded octet)? CO ₂ , ClF ₃ , SO ₂ , IF ₅ b) Why NH ₃ possess a pyramidal shape? Explain.	3																				
23.	Complete the table <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Type</th> <th>No of electron pairs</th> <th>Geometry</th> <th>Bond angle</th> <th>Examples</th> </tr> </thead> <tbody> <tr> <td>AB₅</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>AB₃</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>AB₄</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Type	No of electron pairs	Geometry	Bond angle	Examples	AB ₅					AB ₃					AB ₄					3
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24.	Calculate the formal charge of all the atoms in the following a) SO ₂ b) NH ₄ ⁺ c) H ₂ SO ₄	2 each																				
25.	What are the favourable condition for the formation of ionic bond?	2																				
26.	Define lattice enthalpy. On what factors do they depend?	3																				
27.	What are the important postulates of VSEPR theory?	3																				
28.	Give the definition for bond dissociation enthalpy. Also explain the factors on which it depend.	3																				
29.	Briefly explain the limitations of octet with proper examples.	3																				
30.	Predict the shapes of the following using VSEPR model BCl ₃ , SiCl ₄ , H ₂ S, PH ₃ , SF ₆ , PCl ₅	3																				
31.	Draw the Lewis structures of the following a) HCOOH b) SiCl ₄ c) H ₂ S	3																				