

Class: XI
Subject: Chemistry
Topic: Chemical Bonding and Molecular Structure
No. of Questions: 27

Q1. Which of the following bonds is the most stable?

- A. $1s - 1s$
- B. $2p - 2p$
- C. $2s - 2s$
- D. $1s - 2p$

Q2. Which of the following bonds are present in dry ice?

- A. Ionic bonds
- B. Covalent bonds
- C. Hydrogen bonds
- D. None of the above

Q3. Which structure will the compounds formed by sp^3d hybridisation have in the absence of a lone pair?

- A. Planar
- B. Pyramidal
- C. Angular
- D. Trigonal bi pyramidal

Q4. Which of the following is least ionic?

- A. AgCl
- B. KCl
- C. $BaCl_2$
- D. NaCl

Q5. Which of the following forces between atoms or ions or molecules is the strongest?

- A. Ionic bond
- B. Ion-dipole
- C. Dipole-dipole
- D. London dispersive

Q6. How many electrons are needed by Phosphorus to attain the configuration of nearest noble gas?

- A. 1
- B. 2
- C. 4
- D. 3

Q7. _____ is an electron deficient molecule.

- A. CCl_4
- B. PCl_5
- C. BF_3
- D. SF_6

Q8. How many total electron pairs are present in valence shell of oxygen in water molecule?

- A. 4
- B. 1
- C. 2
- D. 3

Q9. Which of the following geometrical configurations corresponds to dsp^2 hybridization?

- A. Tetrahedral
- B. Square planar
- C. Trigonal bi pyramidal
- D. Octahedral

Q10. How many electrons take part in the formation of bond in N_2 ?

- A. 6
- B. 4
- C. 2
- D. 10

Q11. The numbers of bond pairs and lone pairs in ammonia molecule are _____, respectively.

- A. 2 and 2
- B. 1 and 2
- C. 3 and 1
- D. 4 and 0

Q12. Which substance would you expect to have the highest melting point?

- A. NaF
- B. NaCl
- C. NaBr
- D. NaI

Q13. Which of the following contains both covalent and ionic bonds?

- A. CCl_4
- B. $CaCl_2$
- C. NH_4Cl
- D. $SiCl_4$

Q14. Which of the following has the greatest covalent character?

- A. LiCl
- B. NaCl
- C. KCl
- D. RbCl

Q15. The correct order of bond angles in H_2O , NH_3 , CH_4 and CO_2 is

- A. $\text{H}_2\text{O} > \text{NH}_3 > \text{CO}_2 > \text{CH}_4$
- B. $\text{CH}_4 > \text{CO}_2 > \text{NH}_3 > \text{H}_2\text{O}$
- C. $\text{CO}_2 > \text{CH}_4 > \text{H}_2\text{O} > \text{NH}_3$
- D. $\text{CO}_2 > \text{CH}_4 > \text{NH}_3 > \text{H}_2\text{O}$

Q16. Which one of the following is a correct set with respect to molecule, hybridisation and shape?

- A. BeCl_2 , sp , linear
- B. BeCl_2 , sp^2 , trigonal planar
- C. BCl_3 , sp^2 , trigonal planar
- D. BCl_3 , sp^3 , tetrahedral

- (i) A and B
- (ii) B and C
- (iii) C and D
- (iv) A and C

Q17. Which of the following compounds/ions will have the maximum bond angle?

- A. SO_2
- B. CH_4
- C. H_2S
- D. H_3O^+

Q18. Phosphorus (atomic number 15) and hydrogen elements combine to form a compound whose formula is

- A. P_2H_2
- B. H_2P
- C. PH_3
- D. PH

Q19. Which of the following statements about electrovalent substances is false?

- A. Electrovalent substances are made up of ions held together by strong electrostatic forces.
- B. Electrovalent substances have high melting and boiling points.
- C. Electrovalent compounds can conduct electricity in solid state.
- D. None of these

Q20. Which of the following is not a characteristic of covalent compound?

- A. They are good conductors of electricity.
- B. They are soluble in non polar solvents.
- C. They have low melting and boiling point.
- D. None of these

Q21. Write the favourable factors for the formation of ionic bond.

Q22. Although geometries of NH_3 and H_2O molecules are distorted tetrahedral, bond angle in water is less than that of ammonia. Discuss.

23. Write the significance / applications of dipole moment.

Q24. Arrange the bonds in order of increasing ionic character in the molecules: LiF , K_2O , N_2 , SO_2 and ClF_3 .

Q25. Distinguish between a sigma and a pi bond.

Q26. Explain the formation of H_2 molecule on the basis of valence bond theory.

Write the important conditions required for the linear combination of atomic orbitals to form molecular orbitals.

Q27. Write the significance of a plus and a minus sign shown in representing the orbitals.