JEE CHEMISTRY

Topic: Chemical Bonding

Q.1 **Which of the following statements is correct about N_2 molecule:**

(A) It has a bond order of 3

(B) The number of unpaired electrons present in it zero and hence it is diamagnetic

(C) The order of filling of MO is [$\pi_{(2p_x)}$) = $\pi_{(2p_y)}$], $\sigma_{(2p_z)}$

(D) All the above three statements are correct

Q.2 **A hybrid orbital formed from s-and p-orbital can contribute to:**

(A) A σ bond only

(B) π bond only

(C) Either σ or π bond

(D) None of these

Q.3 **Which carbon is more electronegative:**

(A) sp^3 hybridised carbon

(B) sp hybridised carbon

(C) sp^2 hybridised carbon

(D) The electron attracting power of C is always same irrespective of its hybrid state

Q.4 **Which of the following statement is incorrect of PCl_5:**

(A) Its all P-Cl bond lengths are equal

(B) It involves sp^3d hybridization

(C) It has an regular geometry

(D) Its shape is trigonal bipyramidal

Q.5 **In a change from $PCl_3 \rightarrow PCl_5$, The hybrid state of P change from:**

(A) sp^2 to sp^3 **(B) sp^3 to sp^2**

(C) sp^3 to sp^3d **(D) sp^3 to dsp^2**

Q.6 **The hybrid state of B in BF_4^- is :**

(A) sp^2 **(B) sp**

(C) sp^3 **(D) No specific**

Q.7 Which of the following has been arranged in order of decreasing dipole moment:

(A) $CH_3Cl > CH_3F > CH_3Br > CH_3I$

(B) $CH_3F > CH_3Cl > CH_3Br > CH_3I$

(C) $CH_3Cl > CH_3Br > CH_3I > CH_3F$

(D) $CH_3F > CH_3Cl > CH_3I > CH_3Br$

Q.8 The phosphate of a metal has the formula $MHPO_4$. The formula of its chloride would be:

(A) MCl (B) MCl_2

(C) MCl_3 (D) M_2Cl_3

Q.9 Intramolecular H-bonding is present in :

(A) o-Nitrophenol (B) Salicylaldehyde

(C) m-Nitrophenol (D) Both (A) and (B)

Q.10 Which of the following statement is not correct -

(A) CH_3^+ shows sp^2-hybridisation where as
CH_3^- shows sp^3-hybridisation

(B) NH_4^+ has a regular tetrahedral geometry

(C) sp^2-hybridised orbitals have equal s and p character

(D) Hybridisation orbitals always form σ-bonds

Q.11 Which of the following compound does not follow octet rule:

(A) CO_2 (B) PCl_3

(C) ICl (D) ClF_3

Q.12 The magnitude of the lattice energy of a solid increases if:

(A) The ions are of large size

(B) The ions are of small size

(C) The ions are of equal size

(D) Charges on the ions are small

Q.13 Out of XeF_6, CH_4 and SF_4 the molecules having regular geometry are:

(A) XeF_6 only (B) XeF_6 and SF_4

(C) CH_4 only (D) CH_4 and SF_4

Q.14 The bond angle in H_2O molecule is less than that of NH_3 molecule because:

(A) The hybridisation of O in H_2O and N in NH_3 is different

(B) The atomic radili of N and O are different

(C) There is one lone pair of electrons on O and two lone pairs of electrons on N

(D) There are two lone pairs of electrons on O and one lone pairs of electrons on N

Q.15 In which of the following species the angle arround the central atom is exactly equal to 109°28' :

(A) SF_4 **(B)** NH_3

(C) NH_4^+ **(D) None of the above**

Q.16 The bond angless of NH_3,and are in the order:

(A) $NH_2^- > NH_3 > NH_4^+$

(B) NH_4^+ **>** NH_3 **>** NH_2^-

(C) NH_3 **>** $NH_2^- > NH_4^+$

(D) NH_3 **>** NH_4^+ **>** NH_2^-

Q.17 The pair of molecules having identical geometry is:

(A) BCl_3, PCl_3 **(B)** BF_3, NF_3

(C) CCl_4, CH_4 **(D)** CH_4, SF_4

Q.18 Which of the following compounds is non-polar:

(A) CH_3Cl **(B)** CH_2Cl_2

(C) $CHCl_3$ **(D)** CCl_4

Q.19 Which of the following has zero value of dipole moment:

(A) Benzene (B) Naphthalene

(C) p-dichlorobenzene (D) All the three

Q.20 Which one of the following molecules has highest dipole moment:

(A) H_2S **(B)** CO_2 **(C)** CCl_4 **(D)** BF_3

Q.21 Number of valence electrons present in atoms of $HClO_4$, $HClO_3$, $HClO_2$ respectively are:

(A) 32, 26, 20 (B) 26, 20, 14

(C) 36, 30, 24 (D) 28, 22, 16

Q.22 Which of the following does not apply to metallic bond:

(A) Overlapping valence orbital

(B) Mobile valency electron

(C) Delocalized electrons

(D) None

Q.23 Acetic acid is a dimer in benzene due to

(A) Condensation reaction

(B) Hydrogen bonding

(C) Presence of carboxylic group

(D) Presence of hydrogen atom at α-carbon

Q.24 The nature of intermolecular forces among benzene (C_6H_6) molecules is:

(A) Dipole-dipole attraction

(B) London dispersion force

(C) Ion-dipole attraction

(D) Hydrogen bonding

Q.25 The compound formed by which of the following pair of ions will have lowest melting point :

(A) Na^+ and Cl^- (B) Mg^{2+} and Cl^-

(C) Al^{3+} and Cl^- (D) Sn^{4+} and Cl^-

Q.26 In the electronic structure of acetic acid the number of electrons present are:

(A) 16 shared and 8 unshared

(B) 8 shared and 16 unshared

(C) 12 shared and 12 unshared

(D) 18 shared and 6 unshared

Q.27 Amongst NH_3, $BeCl_2$, CO_2 and H_2O, the non-linear molecules are :

(A) $BeCl_2$ and H_2O (B) $BeCl_2$ and CO_2

(C) NH_3 and H_2O (D) NH_3 and CO_2

Q.28 Which is not correct:

(A) Bond angle H–S–H < H–OH

(B) Bond angle F–O–F < Cl–O–Cl

(C) Bond angle H–P–H < H–N–H

(D) Bond angle Cl–Sn–Cl > Cl–Hg–Cl

Q.29 Which of the following match is not correct:

(A) ICl_2^- — Linear ion

(B) ICl_4^- — Square planar ion

(C) XeF_2 — Linear molecule

(D) SO_4^{2-} — Trigonal planar ion

Q.30 The value of bond order in NO^+ according to MOT is:

(A) 3 (B) 2 (C) 1 (D) 0

ANSWER KEY

Que.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Ans.	D	A	B	A	C	C	A	B	D	C
Que.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Ans.	D	B	C	D	C	B	C	D	D	A
Que.	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Ans.	A	A	B	B	D	A	C	D	D	A