

CHEMICAL BONDING

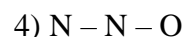
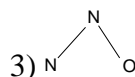
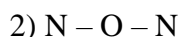
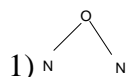
- 1) In Graphite, carbon atoms are
- 1) sp^3 hybridised 2) sp^2 hybridised 3) sp hybridised 4) non hybridized
- 2) Linear molecule among the following is
- 1) H_2O 2) NH_3 3) BF_3 4) CO_2
- 3) The boiling point of water is unexpectedly high because
- 1) Water forms a bent molecule 2) It is covalent compound
- 3) It has a high dielectric constant
- 4) There is association of molecule due to hydrogen bonding
- 4) In which compound is the bonding largely covalent?
- 1) NaH 2) CsH 3) BeH_2 4) BaH_2
- 5) Which set contain no ionic no ionic species
- 1) NH_4Cl, OF_2, H_2S 2) CO_2, CCl_4, Cl_2 3) BF_3, AlF_3, TIF_3 4) I_2, CaO, CH_3Cl
- 6) (Molecule type) (Number of lone pair e^- on central atom A)
- i) AB_2 p) zero
- ii) AB_3 q) one
- iii) AB_4 r) two
- s) three
- Set of condition when AB_2, AB_3, AB_4 type neutral molecules have non zero dipole moment:
- 1) (i)=q,r 2) ii)=q,r 3) iii)=q 4) All of these
- 7) The incorrect order of bond angle:
- 1) $CO_2 > CO_3^{2-} > CF_2Cl_2$ 2) $NO_2^+ > NO_3^- > NO_2^-$
- 3) $XeF_2 > XeF_4 > XeO_4$ 4) $PH_3 > AsH_3 > SbH_3$

- 8) Select the incorrect order for given properties
- 1) $\text{LiH} > \text{NaH} > \text{KH} > \text{RbH}$ (Thermal stability)
 - 2) $\text{CdCO}_3 > \text{CaCO}_3 > \text{K}_2\text{CO}_3$ Covalent character
 - 3) $\text{BeCO}_3 > \text{MgCO}_3 > \text{CaCO}_3$ (Ease of oxide formation on heating at same temperature)
 - 4) $\text{BeF}_2 > \text{MgF}_2 > \text{CaF}_2 > \text{SrF}_2$ (solubility in water)
- 9) Which of the following options represent the change in the bond angle in given reaction :
- $$\text{BF}_3 \rightarrow \text{BF}_4^-$$
- 1) 120°
 - 2) $109^\circ 28'$
 - 3) $10^\circ 72'$
 - 4) 60°
- 10) In which of the following pairs both the molecules are non existing ?
- 1) SF_4, OF_4
 - 2) OF_4, OF_6
 - 3) SF_4, SF_6
 - 4) OF_2, OF_4
- 11) In which of the given change bond angle at central atom is not change ?
- 1) $\text{AlCl}_3 \rightarrow \text{AlCl}_4^-$
 - 2) $\text{CH}_4 \rightarrow \text{CH}_3^+$
 - 3) $\text{CH}_3^- \rightarrow \text{CH}_4$
 - 4) $\text{CH}_4 \rightarrow \text{CF}_4$
- 12) The central atom assumes sp^3 – hybridisation in
- 1) PCl_3
 - 2) SO_3
 - 3) NO_3^-
 - 4) BF_3
- 13) T-shape is exhibited by the molecule.
- 1) ClF_3
 - 2) CHCl_3
 - 3) PCl_5
 - 4) CCl_4
- 14) In allene (C_3H_4) the type/s of hybridization of carbon atom is/are
- 1) only sp^2
 - 2) sp & sp^3
 - 3) sp^2 and sp^3
 - 4) sp & sp^2
- 15) Which of the following has a linear shape ?
- 1) O_3
 - 2) NO_2^+
 - 3) SO_2
 - 4) NO_2^-
- 16) Which of the following is not isostructural with SiCl_4 ?
- 1) PO_4^{3-}
 - 2) SCL_4
 - 3) SO_4^{2-}
 - 4) NH_4^+

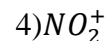
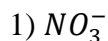
- 17) Which of the following has maximum number of lone pairs on central atom?
 1) I_3^- 2) XeF_4 3) SF_4 4) ClO_3^-
- 18) According to molecular orbital theory which of the following statement about the magnetic character and bond order is correct regarding O_2^+
 1) Diamagnetic and bond order $> O_2$ 2) Diamagnetic and bond order $< O_2$
 3) Paramagnetic and bond order $> O_2$ 4) Paramagnetic and bond order $< O_2$
- 19) Which of the following molecular species has unpaired electrons?
 1) N_2 2) F_2 3) O_2^- 4) O_2^{2-}
- 20) Which of the following pairs of molecules will have permanent dipole moments for both members?
 1) SiF_4 and NO_2 2) NO_2 and CO_2 3) SiF_4 and CO_2 4) NO_2 and O_3
- 21) Which of the following pairs of species have the same bond order?
 1) NO^+ & CN^- 2) O_2^- & CN^- 3) CN^- & CN^+ 4) CN^- & NO^+
- 22) The energy required to break one mole of Cl– Cl bonds in Cl_2 is 2 and 2 kJ / mol. The longest wave length of light capable of breaking a single Cl – Cl bond is:
 1) 594 nm 2) 700 nm 3) 640 nm 4) 494 nm
- 23) In which of the following pairs, the species are not iso structural?
 1) PCl_4^+ & $SiCl_4$ 2) PF_5 and Br_5 3) CO_3^{2-} and NO_3^- 4) AlF_6^{3-} & SF_6
- 24) The geometry of the molecule with 25% s-character in hybrid orbital is:
 1) Linear 2) Octahedral 3) tetrahedral 4) plane triangular
- 25) A section of the periodic table is given below with elements A, B and X, Y in two groups. Which of the bonds given below is the least polar?
 A X
 B Y
 1) AX 2) AY 3) BX 4) BY

- 26) Molecular shapes of SF₄, CF₄ and XeF₄ are
- 1) Same with 2, 0 and 1 lone pairs of electrons respectively
 - 2) Same with 1, 1 and 1 lone pairs of electrons respectively
 - 3) Different with 1, 0, and 2 lone pairs of electrons respectively
 - 4) Different with 1, 1, and 1 lone pairs of electrons respectively
- 27) The energy of σ_{2s} is greater than σ_{1s}^* orbital because
- 1) σ_{2s} orbital is bigger than σ_{1s} orbital
 - 2) σ_{2s} is a bonding orbital where σ_{1s}^* is an antibonding orbital
 - 3) σ_{2s} orbital has greater value of n than σ_{1s}^* orbital
 - 4) σ_{2s} orbital is formed only after σ_{1s}
- 28) Which of the following is an isoster of N₂?
- 1) CO₂
 - 2) CO
 - 3) N₂O
 - 4) O₂
- 29) Which one of the following is most stable?
- 1) H₂⁺
 - 2) H⁺
 - 3) H⁻
 - 4) H₂⁻
- 30) Among the following, which compound will show the highest lattice enthalpy?
- 1) KF
 - 2) NaF
 - 3) CsF
 - 4) RbF
- 31) In which of the following molecules / ions are all the bonds not equal?
- 1) XeF₄
 - 2) BF₄⁻
 - 3) SF₄
 - 4) SiF₄
- 32) Which of the following is least ionic?
- 1) KCl
 - 2) AgCl
 - 3) BaCl₂
 - 4) CoCl₂
- 33) Four elements A, B, C and D from a series of compound having the formulae AB, B₂, CB₃, DB₂ and DB₃. If the jumbled up atomic numbers of A, B, C and D are 13, 19, 26 and 35, then the ordered atomic numbers of A, B, C and D will be respectively.
- 1) 13, 19, 26, 35
 - 2) 19, 35, 26, 13
 - 3) 26, 35, 13, 19
 - 4) 19, 35, 13, 26

34) N_2O is isoelectronic with CO_2 and N_3^- , Which is the structure of N_2O ?



35) The ONO bond angle is maximum in



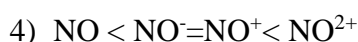
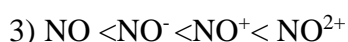
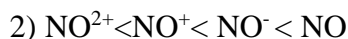
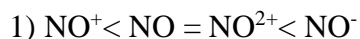
36) Among the following the paramagnetic compound is



37) Which of the following diatomic molecule would be stabilized by the removing of an electron?



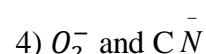
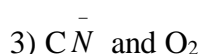
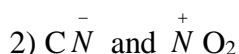
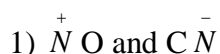
38) For the species NO , NO^+ , NO^{2+} and NO^- , the correct order of bond lengths is



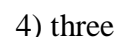
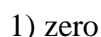
39) CaO and NaCl have the same crystal structure and approximately the same ionic radii. If U is the lattice energy of NaCl , the approximate lattice energy of CaO is



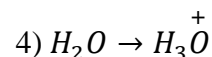
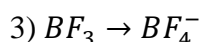
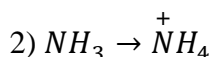
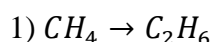
40) Which of the following pairs of species has the same bond order?



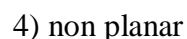
41) In CO_2 the number of electrons in 2 anti bonding orbital is



42) Which one of the following conversions involves changes in both hybridization and shape?



43) N_2O is isoelectronic with CO_2 , which is the structure of N_2O ?



- 44) The dipole moment is the highest for
- 1) trans – 2 butane
 - 2) 1, 3 – dimethyl benzene
 - 3) acetophenone
 - 4) ethane
- 45) Which of the following has $d\pi - p\pi$ bonding?
- 1) NO_3^-
 - 2) SO_3^{2-}
 - 3) BO_3^{3-}
 - 4) CO_3^{2-}
- 46) Specify the coordination geometry around hybridization of N and B atoms in a 1:1 mixture of BF_3 and NH_3 .
- 1) N:tetrahedral, sp^3 ; B:tetrahedral, sp^3
 - 2) N: pyramidal, sp^3 ; B:tetrahedral, sp^3
 - 3) N:pyramidal, sp^3 ; B: pyramidal, sp^3
 - 4) N: pyramidal, sp^3 ; B:planar, sp^2
- 47) The dipole moment of LiH is found to be 2×10^{-29} Cm. If the inter atomic distance in LiH is 1.6 \AA , then the percent of ionic character of Li-H bond is nearly.
- 1) 80%
 - 2) 60%
 - 3) 50%
 - d) 40%
- 48) Consider H_2CO_3 and CO_3^{2-} ion. Which of the following is correct?
- 1) There is no resonance in H_2CO_3
 - 2) Resonance stabilization energy of CO_3^{2-} is more than in H_2CO_3
 - 3) Resonance stabilisation energy of H_2CO_3 is more than CO_3^{2-}
 - 4) There is no resonance in CO_3^{2-}
- 49) What is true about PF_5 ?
- 1) The molecule does not exist
 - 2) P – F bonds are coordinate covalent
 - 3) All P – F bonds are not equal
 - 4) Molecule has pentagonal planar geometry
- 50) The C – H bond distance is the longest in
- 1) C_2H_2
 - 2) C_2H_4
 - 3) $C_2H_4Br_2$
 - 4) C_6H_6