



# CHEMISTRY

## BOOKS - NEET PREVIOUS YEAR (YEARWISE + CHAPTERWISE)

### CHEMICAL BONDING

#### Exercise

1. Which of the following pairs of species have the same bond order ?

A.  $\text{CO}$ ,  $\text{NO}$

B.  $\text{O}_2$ ,  $\text{NO}^+$

C.  $\text{CN}^-$ ,  $\text{CO}$

D.  $\text{N}_2$ ,  $\text{O}_2^-$

**Answer: C**



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2. Predicted the correct order among the following

A. lone pair-lone pair  $\text{gt}$  bond pair- bond pair  $\text{gt}$  lone pair- bond pair

B. bond pair - bond pair  $\text{gt}$  lone pair- bond pair  $\text{gt}$  lone pair-lone pair

C. lone pair - bond pair  $\text{gt}$  bond pair-bond pair  $\text{gt}$  lone pair - lone pair

D. lone pair - lone pair  $\text{gt}$  lone pair-bond pair  $\text{gt}$  bond pair - bond pair

**Answer: D**



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3. Consider the molecules  $CH_4$ ,  $NH_3$  and  $H_2O$  which of the given statement is false ?

A. The H-O-H bond angle in  $H_2O$  is larger than the H-C-H bond angle in  $CH_4$

B. The H-O-H bond angle in  $H_2O$  is smaller than the H-N-H bond angle in  $NH_3$

C. The H-C-H bond angle in  $CH_4$  is larger than the H-N-H bond angle in  $NH_3$

D. The H-C-H bond angle in  $CH_4$ , the H-N-H bond angle in  $NH_3$  and the H-O-H bond angle in  $H_2O$  are all the greater than  $90^\circ$

**Answer: A::D**



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4. Which one of the following compounds shows the presence of intramolecular hydrogen bond ?

A.  $H_2O_2$

B. HCN

C. Cellulose

D. Concentrated acetic acid

**Answer: C**



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5. The hybridisation of atomic orbitals of nitrogen in  $NO_2^+$ ,  $NO_3^-$  and  $NH_4^+$  are :

A.  $sp$ ,  $sp^3$  and  $sp^2$

B.  $sp^2$ ,  $sp^3$  and  $sp$

C.  $sp$ ,  $sp^2$  and  $sp^3$

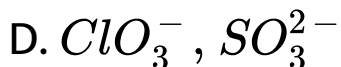
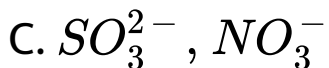
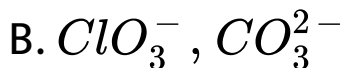
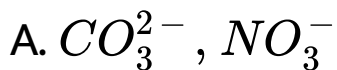
D.  $sp^2$ ,  $sp$  and  $sp^3$

**Answer: C**



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6. Which of the following pairs of ions are isoelectronic and isostructural?



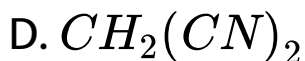
**Answer: A**



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7. Which of the following species contains equal number of pi and pi bonds ?



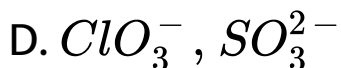
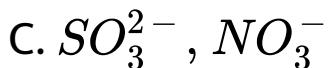
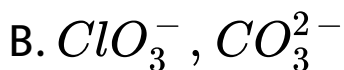
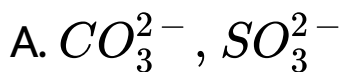


**Answer: B**



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**8.** Which of the following pairs of ions are isoelectronic and isostructural?

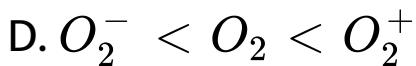
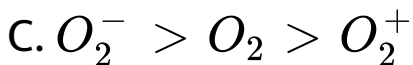
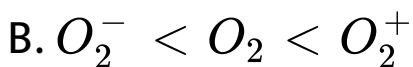
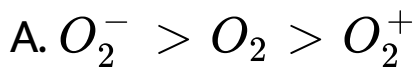


**Answer: D**



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**9.** Which of the following options represents the correct bond order ?

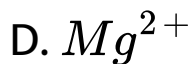


**Answer: B**



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**10.**  $Be^{2+}$  is isoelectronic with which of the following ions ?



**Answer: B**



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**11.** Which of the following molecules has the maximum dipole moment ?



**Answer: D**



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**12.** Which of the following species has plane  
tringular shape ?



**Answer: B**



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**13.** Identify the correct order of solubility in aqueous medium

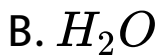


**Answer: D**



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**14.** Which one of the following molecules contains no  $\pi$  - bond ?

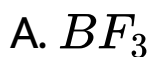


**Answer: B**

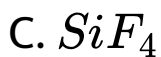


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**15.** Which of the following is a polar molecule





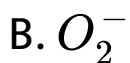


**Answer: B**



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**16.** Which of the following is paramagnetic?



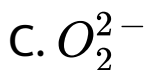
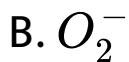


**Answer: B**



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**17. Bond order of 1.5 is shown by:**



D.  $O_2$

**Answer: B**



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**18.** Which of the following species contains three bond pairs and one lone pair around the central atom?

A.  $H_2O$

B.  $BF_3$

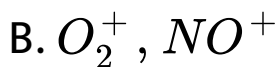
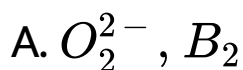


**Answer: D**



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**19.** The pair of species with the same bond order is :



C. NO, CO

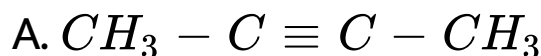
D.  $N_2$ ,  $O_2$

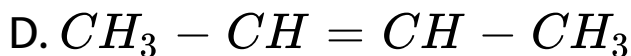
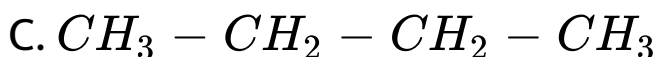
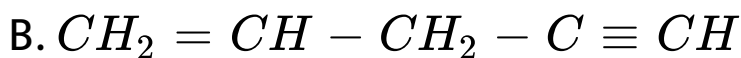
**Answer: A**



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**20.** Considering the state of hybridization of carbon atoms, find out the molecule among the following which is linear?





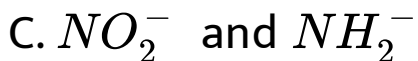
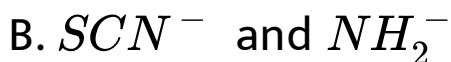
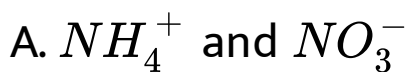
**Answer: A**



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21. Which of the two ions from the list given have the geometry that is explained by the same hybridization of orbitals



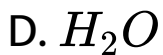


**Answer: D**



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**22.** Which of the following is least likely to behave as Lewis acid?



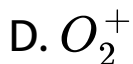
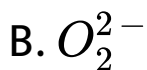
**Answer: B**



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**23.** Which of the following has the minimum bond length ?





**Answer: D**



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**24.** In which of the following pairs of molecules/ ions, the central atoms have  $sp^2$ -hybridization ?

A.  $\text{NO}_2^-$  and  $\text{NH}_3$

B.  $\text{BF}_3$  and  $\text{NO}_2^-$

C.  $\text{NH}_2^-$  and  $\text{H}_2\text{O}$

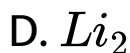
D.  $\text{BF}_3$  and  $\text{NH}_2^-$

**Answer: B**



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**25.** Which of the following species does not exist under normal condition ?

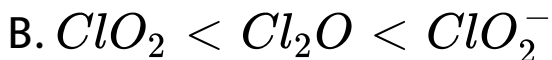


**Answer: B**



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**26.** The correct order of increasing bond angles in the following species is



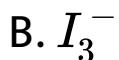
**Answer: D**



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**27.** In which one of the following species , the central atom has the tuyepe of hybdrizition

which is not the same as that present in other three?



**Answer: C**



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28. What is the dominant intermolecular forces or bond that must be overcome in converting liquid  $CH_3OH$  to gas ?

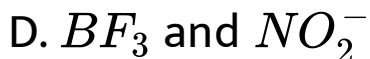
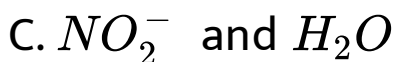
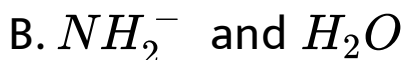
- A. Hydrogen bonding
- B. Dipole-dipole interaction
- C. Covalent bonds
- D. London or dispersion force

**Answer: A**



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29. In which of the following molecules/ions in the central atom  $sp^2$ -hybridized?



**Answer: D**



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**30.** In the case of alkali metals, the covalent character decreases in the order.

A.  $\text{MCl} > \text{MI} > \text{MBr} > \text{MF}$

B.  $\text{MF} > \text{MCl} > \text{MBr} > \text{MI}$

C.  $\text{MF} > \text{MCl} > \text{MI} > \text{MBr}$

D.  $\text{MI} > \text{MBr} > \text{MCl} > \text{MF}$

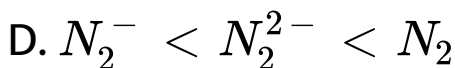
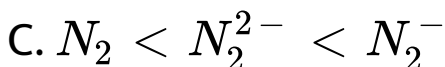
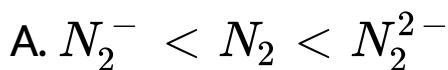
**Answer: D**



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31. According to MO theory which of the following lists makes the nitrogen species in terms of increasing bond order?

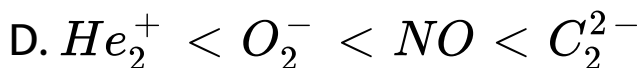
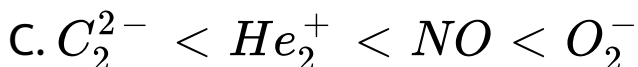
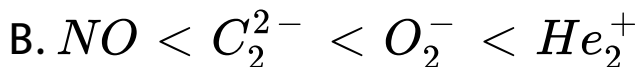
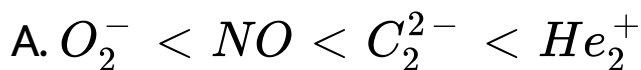


**Answer: B**



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**32.** Four diatomic species are listed in different sequence .Which of these represent the correct order of their increasing bond order?



**Answer: D**



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33. The correct order of increasing bond angles in the following triatomic species is



**Answer: B**



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**34.** Angular shape of ozone molecule consists of

- A. 1 sigma and 2 pi-bonds
- B. 2 sigma and 2 pi-bonds
- C. 1 sigma and 1 pi-bonds
- D. 2 sigma and 1 pi-bonds

**Answer: D**



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35. In which of the following pairs, the two species are isostructural :

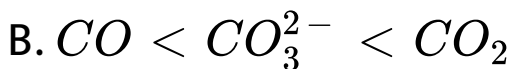


**Answer: D**



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36. The correct order of increasing  $C - O$  bond lengths in  $CO$ ,  $CO_3^{2-}$  and  $CO_2$  is :



**Answer: D**



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37. Which of the following is not a correct statement ?

A. The electron deficient molecules can act as Lewis acids

B. The canonical structures have no real existence

C. Every  $AB_5$  molecule does infact have square pyramid structure

D. Multiple bonds are always shorter than corresponding single bond

**Answer: C**



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**38.** The electronegativity difference between  $N$  and  $F$  is greater than that between  $N$  and  $H$  yet the dipole moment of  $NH_3$  ( 1.5 D) is larger than that of  $NF_3$ (0.2D). This is because :



A. in  $NH_3$  as well as in  $NF_3$  , the atomic dipole and bond dipole are in the same direction

B. in  $NH_3$ , the atomic dipole and bond dipole are in the same direction whereas in  $NF_3$  these are in opposite directions

C. in  $NH_3$  as well as  $NF_3$  , the atomic dipole and bond dipole are in opposite directions

D. in  $NH_3$  the atomic dipole and bond dipole are in the opposite directions whereas in  $NF_3$  these are in the same directions

**Answer: B**



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**39.** Which of the following is not isostructural with  $SiCl_4$  ?



**Answer: A**



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**40.** The number of unpaired electrons in a paramagnetic diatomic molecule of an element with atomic number 16 is :

A. 2

B. 3

C. 4

D. 1

**Answer: A**



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**41.** Which of the following species has a linear shape?

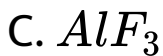


**Answer: C**



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**42.** In which of the following molecules are all the bonds not equal ?



**Answer: A**



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**43.** The correct sequence of increasing covalent character is represent by

A.  $\text{LiCl}$   $\text{lt}$   $\text{NaCl}$   $\text{lt}$   $\text{BeCl}_2$

B.  $\text{BeCl}_2 < \text{NaCl} < \text{LiCl}$

C.  $\text{NaCl} < \text{LiCl} < \text{BeCl}_2$

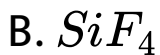
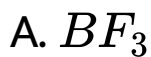
D.  $\text{BeCl}_2 < \text{LiCl} < \text{NaCl}$

**Answer: C**



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**44.** Which of the following would have permanent dipole moment ?



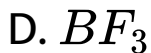
**Answer: C**



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**45.** Which molecule has trigonal planar geometry ?





**Answer: D**



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**46.** In  $BrF_3$  molecule, the lone pair occupies equatorial position minimize

- A. lone pair - bond pair repulsion
- B. bond pair- bond pair repulsion
- C. lone pair - lone pair repulsion and lone pair - bond pair repulsion
- D. lone pair - lone pair repulsion

**Answer: D**



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47.  $H_2O$  is dipolar, whereas  $BeF_2$  is not. It is because

A. the electronegativity of F is greater than that of O

B.  $H_2O$  involves hydrogen bonding whereas  $BeF_2$  is a discrete molecule

C.  $H_2O$  is linear and  $BeF_2$  is angular

D.  $H_2O$  is angular and  $BeF_2$  is linear

**Answer: D**



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**48.** In an octahedral structure , the pair of d orbitals involved in  $d^2sp^2$  hybridization is

A.  $d_{x^2-y^2}, d_z^2$

B.  $d_{xz}, d_{x^2-y^2}$

C.  $d_z^2, d_{xz}$

D.  $d_{xy}, d_{yz}$

**Answer: A**



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**49.** In a regular octahedral molecule  $MX_6$  the number of  $X - M - X$  bonds at  $180^\circ$  is

A. 3

B. 2

C. 6

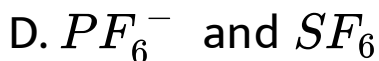
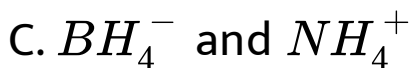
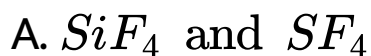
D. 4

**Answer: A**



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50. Among the following the pair in which the two species are not isostructural is



**Answer: A**



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51. Which of the following statement is not correct for sigma and pi- bonds formed between two carbon atoms ?

A. Free rotation of atoms about a sigma bond is allowed but not in case of a pi-bond

B. Sigma bond determines the direction between carbon atoms but a pi-bond has no primary effect in this regard

C. Sigma bond is stronger than a pi-bond

D. Bond energies of sigma and pi-bonds are of the order of 264 kJ/mol and 347 kJ/mol respectively.

**Answer: D**



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52. In  $\text{NO}_3^-$  ion, the number of bond pair and lone pair of electrons on N-atom are :

A. 2,2



B. 3,1

C. 1,3

D. 4,0

**Answer: D**



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**53.** Which of the following has  $p\pi - d\pi$  bonding?

A.  $\text{NO}_3^-$

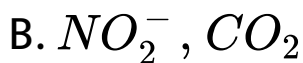
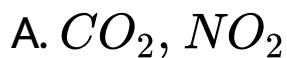


**Answer: B**



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**54.** Which of the following is isoelectronic ?



C.  $CN^-$ ,  $CO$

D.  $SO_2$ ,  $CO_2$

**Answer: C**



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**55.** The main axis of diatomic molecule is  $z$ .

The orbitals  $p_x$  and  $p_y$  overlap to form

A.  $\pi$ -molecular orbital

B.  $\sigma$  - molecular orbital

C.  $\delta$ -molecular orbital

D. No bond will form

**Answer: A**



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**56.** In  $X - H \cdots Y$ , both X and Y are electronegative elements

A. electron density on X will increase and  
on H will decrease

B. in both electron density will increase

C. in both electron density will decrease

D. on X electron density will decrease and  
on H increase

**Answer: A**



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**57.** In which of the following bond angle is  
maximum

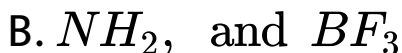
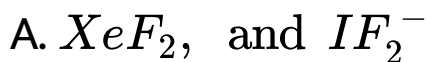


**Answer: B**



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**58.** Which of the following two are isostructural ?



**Answer: A**

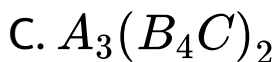
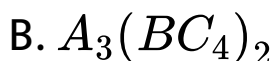
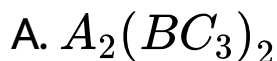


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**59.** A compound contains three elements  $A$ ,  $B$  and  $C$ , if the oxidation number of

$A = +2$ ,  $B = +5$  and  $C = -2$  then

possible formula of the compound is



**Answer: B**



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60. Among the following ions the p  $\pi$ - d  $\pi$  overlap could be present in

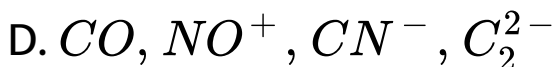
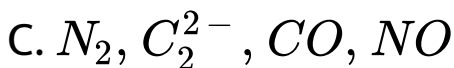
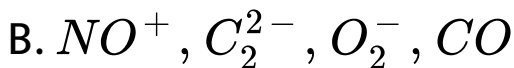


**Answer: C**



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61. Among the following group which represents the collection of isoelectronic species ?



**Answer: D**



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62. Which of the following is not paramagnetic ?

A. NO

B.  $N_2^+$

C. CO

D.  $O_2^-$

**Answer: C**



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**63.** The relationship between the dissociation energy of  $N_2$  and  $N_2^+$  is

A. dissociation energy of  $N_2^+$  gt

dissociation energy of  $N_2$

B. dissociation energy of  $N_2$  = dissociation

energy of  $N_2^+$

C. dissociation energy of  $N_2$  gt dissociation

energy of  $N_2^+$

D. dissociation energy of  $N_2$  can either be lower or higher than the dissociation energy of  $N_2^+$

**Answer: C**



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**64.** Which one of the following is planar ?



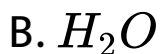


**Answer: A**



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**65.** Which of the following molecule forms linear polymeric structure due to H-bonding ?



C.  $HCl$

D.  $HF$

**Answer: D**



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**66.** The type of hybridisation of boron in diborane is

(a)  $sp$  , (b)  $sp^2$  , (c)  $sp^3$  , (d)  $dsp^2$

A.  $sp$  hybridisation

B.  $sp^2$  hybridisation

C.  $sp^3$  hybridisation

D.  $sp^3d^2$  hybridisation

**Answer: C**



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**67.** In  $PO_4^{3-}$  the formal charge on each O-atom and  $P - O$  bond order respectively are .

A.  $-0.75, 0.6$



B.  $-0.75, 1.0$

C.  $-0.75, 1.25$

D.  $-3, 1.25$

**Answer: C**



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**68.** The species which is not paramagnetic among the following is

A.  $Cl^-$

B.  $Be$

C.  $Ne^{2+}$

D.  $As^+$

**Answer: A**



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**69.** The number of antibonding electron pairs in  $O_2^{2-}$  molecular ion on the basis of molecular orbital theory is

A. 5

B. 2

C. 4

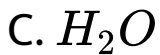
D. 6

**Answer: C**



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**70.** The molecule which does not exhibit dipole moment is



**Answer: D**



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**71.** For two ionic solids,  $CaO$  and  $KI$ , which of the following statements is false?

A. Lattice energy of  $\text{CaO}$  is much larger than that of  $\text{KI}$

B.  $\text{KI}$  is soluble in benzene

C.  $\text{KI}$  has lower melting point

D.  $\text{CaO}$  has higher melting point

**Answer: B**



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72. The high density of water compared to ice is due to

A. hydrogen bonding interactions

B. dipole -dipole interactions

C. dipole - induced dipole interactions

D. induced dipole -induced dipole interactions

**Answer: A**



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**73.**  $N_2$  and  $O_2$  are converted into monoanions  $N_2^-$  and  $O_2^-$  respectively. Which of the following statements is wrong ?

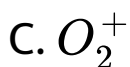
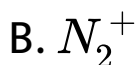
- A. In  $N_2^-$ , the N-N bond weakens
- B. In  $O_2^-$ , O-O bond length increases
- C. In  $O_2^-$ , bond order decreases
- D.  $N_2^-$ , becomes diamagnetic

**Answer: D**



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74. The ion that is isoelectronic with  $CO$  is



**Answer: D**



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75. The  $AsF_5$  molecule is trigonal bipyramidal.

The orbitals used by As for hybridisation are

A.  $d_{x^2-y^2}$ ,  $d_{z^2}$ ,  $s$ ,  $p_x$ ,  $p_y$

B.  $d_{xy}$ ,  $s$ ,  $p_x$ ,  $p_y$ ,  $p_z$

C.  $s$ ,  $p_x$ ,  $p_y$ ,  $p_z$ ,  $p_{xy}$

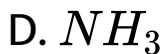
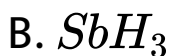
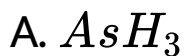
D.  $d_{x^2-y^2}$ ,  $s$ ,  $p_x$ ,  $p_y$ ,  $p_z$

**Answer: C**



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76. Which one of the following has the highest dipole moment ?

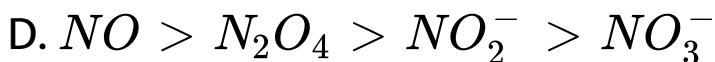
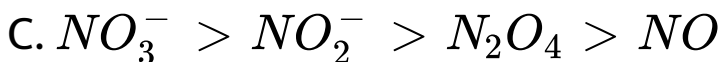
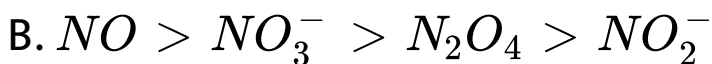
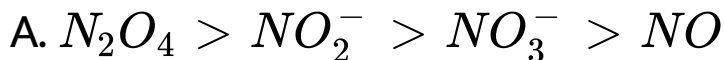


**Answer: D**



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77. The correct order of N-O bond lengths in  $\text{NO}$ ,  $\text{NO}_2^-$ ,  $\text{NO}_3^-$  and  $\text{N}_2\text{O}_4$  is

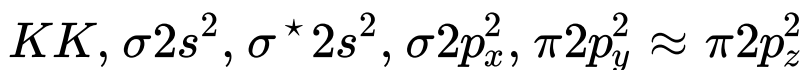


**Answer: C**



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78. The ground state electronic configuration of valence shell electrons in nitrogen molecule ( $N_2$ ) is written as



Bond order in nitrogen molecule is

A. 0

B. 1

C. 0

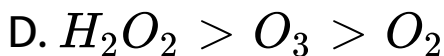
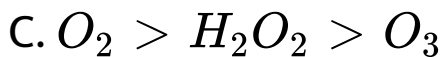
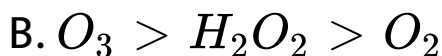
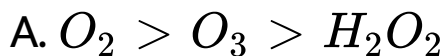
D. 3

**Answer: D**



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79. The correct order of  $O - O$  bond length in  $O_2$ ,  $H_2O$  and  $O_3$ .



**Answer: D**



80.  $BCl_3$  molecule is planar while  $NCl_3$  is pyramidal because

A. B-Cl bond is more polar than N-Cl bond

B. N-Cl bond is more covalent than B-Cl bond

C. nitrogen atom is smaller than boron atom

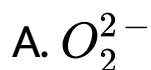
D.  $BCl_3$  has no lone pair but  $NCl_3$  has a lone pair of electrons

**Answer: D**



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**81.** Which of the following species is paramagnetic ?



c.  $CO$

D.  $CN^-$

**Answer: B**



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**82.** The boiling point of *p* – nitrophenol is higher than that of *o* – nitrophenol because.

A.  $NO_2$  group at *p*-position behave in a different way from that at *o*-position



B. intramolecular hydrogen bonding exists  
in p-nitrophenol

C. there is intermolecular hydrogen  
bonding in p-nitrophenol

D. p-nitrophenol has a higher molecular  
weight than o-nitrophenol

**Answer: C**



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**83.** Linus Pauling received the Nobel Prize for his work on

A. atomic structure

B. photosynthesis

C. chemical bonds

D. thermodynamics

**Answer: C**



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84. Among the following orbital bonds, the angle is minimum between

A.  $sp^3$  bond

B.  $p_x$  and  $p_y$  -orbitals

C. H-O-H in water

D.  $sp$  bonds

**Answer: B**



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**85.** Which of the following pairs will form the most stable ionic bond ?

A. Na and Cl

B. Mg and F

C. Li and F

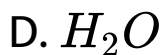
D. Na and F

**Answer: B**



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86. Which of the following does not have a tetrahedral structure ?



**Answer: B**



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**87.** Which is the weakest among the following types of bonds

A. ionic

B. covalent

C. metallic

D. H-bond

**Answer: D**



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**88.** Mark the incorrect statement in the following .

A. The bond order in the species  $O_2$ ,  $O_2^+$

and  $O_2^-$  decreases as  $O_2^+ > O_2 > O_2^-$

B. The bond energy in a diatomic molecule

always increases when an electron is lost

C. Electrons in antibonding MO contribute

to repulsion between two atoms

D. With increase in bond order, bond

length decreases and bond strength

increases.

**Answer: B**



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**89.** The dielectric constant of  $H_2O$  is 80. The electrostatic force of attraction between  $Na^+$  and  $Cl^-$  will be

A. reduced to  $\frac{1}{40}$  in water than in air

B. reduced to  $\frac{1}{80}$  in water than in air



C. will be increased to 80 in water than in  
air

D. will remain unchanged

**Answer: B**



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**90.** When the hybridization state of a carbon atom changes from  $sp^3$  to  $sp^2$  and finally to  $sp$ , the angle between the hybridized orbitals

- A. decreases gradually
- B. decreases considerably
- C. is not affected
- D. increases progressively

**Answer: D**



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**91.** Which of the following statement is not correct ?

A. Double bond is shorter than a single bond

B. Sigma bond is weaker than a  $\pi$ -bond

C. Double bond is stronger than a single bond

D. Covalent bond is stronger than hydrogen bond

**Answer: B**



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92. Which one of the following is the correct order of interactions ?

A. Covalent It hydrogen bonding It van der Waal's It dipole-dipole

B. van der Waals' It hydrogen bonding It dipole-dipole It covalent

C. van der Waals' It dipole dipole It hydrogen bonding It covalent

D. dipole dipole It van der Waals' It hydrogen bonding It covalent

**Answer: B**



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**93.** Which compound will show the highest lattice energy ?

A. KF

B. NaF

C. CsF

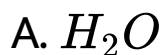
D. RbF

**Answer: B**



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**94.** strongest hydrogen bonding is shown by



**Answer: C**



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95. Which structure is linear ?



**Answer: B**



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96. An  $sp^3$  hybrid orbital possesses

A.  $\frac{1}{4}$  s-character

B.  $\frac{1}{2}$  s-character

C.  $\frac{1}{3}$  s-character

D.  $\frac{2}{3}$  s-character

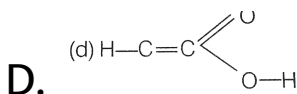
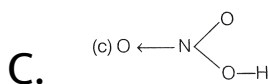
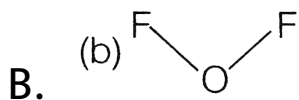
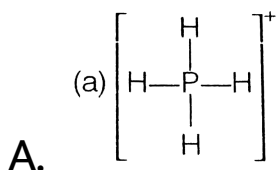
**Answer: A**



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97. Which one of the following formulae does not correctly represent the bonding capacities of the atoms involved ?



**Answer: D**



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**98.** Linear combination of two hybridised orbitals belonging to the two atoms , each having one electron leads to a

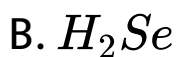
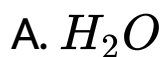
- A. sigma bond
- B. double bond
- C. coordinate bond
- D. pi-bond

**Answer: A**



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99. Which one shows maximum hydrogen bonding ?

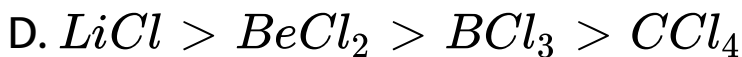
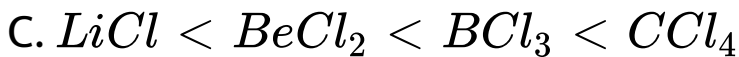
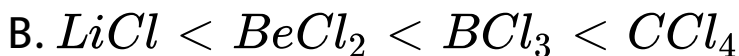
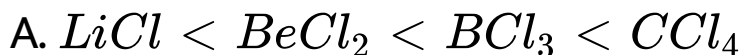


**Answer: D**



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100. Among  $LiCl$ ,  $BeCl_2$  and  $CCl_4$  the covalent bond character varies as .



**Answer: C**



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101.  $H_2O$  has net dipole moment while  $BeF_2$  has zero dipole moment because

A.  $H_2O$  molecule is linear while  $BeF_2$  is bent

B.  $BeF_2$  molecule is linear while  $H_2O$  is bent

C. fluorine has more electronegativity than oxygen

D. beryllium has more electronegativity than oxygen

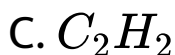
**Answer: B**



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**102.** In which one of the following molecules , the central atom said to adopt  $sp^2$  hybridisation ?

A.  $BeF_2$



**Answer: B**



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**103.** Which of the following does not apply to metallic bond ?

A. Overlapping valence orbitals

B. Mobile valence electrons

C. Delocalised electrons

D. Highly directed bonds

**Answer: D**

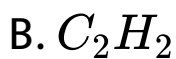


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**104.** Which of the following molecule does not have a linear arrangement of atoms ?

A.  $H_2S$





**Answer: A**



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**105.** The equilateral shape has

A.  $sp$  hybridisation

B.  $sp^2$  hybridisation

C.  $sp^3$  hybridisation

D.  $dsp^2$  hybridisation

**Answer: B**



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**106.** The angle between the overlapping of one s-orbital and one p-orbital is

A.  $180^\circ$

B.  $120^\circ$

C.  $109^{\circ} 28'$

D.  $120^{\circ} 60'$

**Answer: A**



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