EXERCISE-I

Electrovalent bonding

1. In the formation of $NaCl$ from Na and $\gamma -$
(A) Sodium and chlorine both give electrons
(B) Sodium and chlorine both accept electrons
(C) Sodium loses electron and chlorine accepts electron
(D) Sodium accepts electron and chlorine loses electron

2. Which of the following is an electrovalent linkage
(A) CH_4 (B) NCl_5
(C) $SiCl_4$ (D) BF_3

3. Electrovalent compounds do not have
(A) High M.P. and Low B.P.
(B) High dielectric constant
(C) High M.P. and High B.P.
(D) High polarity

4. Many ionic crystals dissolve in water because
(A) Water is an amphiprotic solvent
(B) Water is a high boiling liquid
(C) The process is accompanied by a positive heat of solution
(D) Water decreases the interionic attraction in the crystal lattice due to solvation

5. The electronic structure of four elements A, B, C, D are
(A) $1s^2$ (B) $1s^2, 2s^2\,2p^2$
(C) $1s^2, 2s^2\,2p^5$ (D) $1s^2, 2s^2\,2p^6$
The tendency to form electrovalent bond is largest in
(A) A (B) B
(C) C (D) D

6. The force which holds atoms together in an electrovalent bond is
(A) Vander Waal's force
(B) Dipole attraction force
(C) Electrostatic force of attraction
(D) All the above

7. The main reaction during electrovalent bond formation is
(A) Redox reaction
(B) Substitution reaction
(C) Addition reaction
(D) Elimination reaction

8. Electrovalent compounds are
(A) Good conductor of electricity
(B) Polar in nature
(C) Low M.P. and low B.P.
(D) Easily available

9. Ionic compounds do not have
(A) Hard and brittle nature
(B) High melting and boiling point
(C) Directional properties
(D) Soluble in polar solvents

10. Highest melting point would be of
(A) He (B) $CsCl$
(C) NH_3 (D) $CHCl_3$

11. What is the effect of more electronegative atom on the strength of ionic bond
(A) Decreases (B) Increases
(C) Decreases slowly (D) Remains the same

12. An element X with the electronic configuration $1s^2, 2s^2\,2p^6, 3s^2$ would be expected to form the chloride with the formula
(A) XCl_3 (B) XCl_2
(C) XCl (D) X_2Cl

13. Two element have electronegativity of 1.2 and 3.0. Bond formed between them would be
(A) Ionic (B) Polar covalent
(C) Co-ordinate (D) Metallic

14. Which of the following is least ionic
(A) C_2H_5Cl (B) KCl
(C) $BaCl_2$ (D) $C_6H_5N^+H_3Cl^-$

15. Which type of bonding exists in Li_2O and CaF_2 respectively

(A) Ionic, ionic (B) Ionic, covalent

(C) Covalent, ionic (D) Coordinate, ionic

Covalent bonding

16. Which of the following occurs when two hydrogen atoms bond with each others

(A) Potential energy is lowered

(B) Kinetic energy is lowered

(C) Electronic motion ceases

(D) Energy is absorbed

17. A bond with maximum covalent character between non-metallic elements is formed

(A) Between identical atoms

(B) Between chemically similar atoms

(C) Between atoms of widely different electronegativities

(D) Between atoms of the same size

18. Amongst the following covalent bonding is found in

(A) Sodium chloride

(B) Magnesium chloride

(C) Water

(D) Brass

19. Indicate the nature of bonding in diamond

(A) Covalent (B) Ionic

(C) Coordinate (D) Hydrogen

20. Octet rule is not valid for the molecule

(A) CO_2 (B) H_2O

(C) CO (D) O_2

21. Which of the following compounds are covalent

(A) H_2 (B) CaO

(C) KCl (D) Na_2S

22. Indicate the nature of bonding in CCl_4 and $2s$

(A) Covalent in CCl_4 and electrovalent in CaH_2

(B) Electrovalent in both CCl_4 and CaH_2

(C) Covalent in both CCl_4 and CaH_2

(D) Electrovalent in CCl_4 and covalent in CaH_2

23. If the atomic number of element X is 7, the best electron dot symbol for the element is

(A) X . (B) . X .

(C) . $\dot{\underset{\cdot}{X}}$: (D) : $\ddot{\underset{\cdot\cdot}{X}}$.

24. Which is the most covalent

(A) $C-O$ (B) $C-Br$

(C) $C-S$ (D) $C-F$

25. The covalent compound HCl has the ionic character as

(A) The electronegativity of hydrogen is greater than that of chlorine

(B) The electronegativity of hydrogen is equal to that of chlorine

(C) The electronegativity of chlorine is greater than that of hydrogen

(D) Hydrogen and chlorine are gases

26. The acid having $O-O$ bond is

(A) $H_2S_2O_3$ (B) $H_2S_2O_6$

(C) $H_2S_2O_8$ (D) $H_2S_4O_6$

27. The following salt shows maximum covalent character

(A) $AlCl_3$ (B) $MgCl_2$

(C) $CsCl$ (D) $LaCl_3$

28. Which type of bond is present in H_2S molecule

(A) Ionic bond (B) Covalent bond

(C) Co-ordinate (D) All of three

29. H_2S is more acidic than H_2O, due to

(A) O is more electronegative than S

(B) $O-H$ bond is stronger than $S-H$ bond

(C) $O-H$ bond is weaker than $S-H$ bond

(D) None of these

30. Which of the following has covalent bond

(A) Na_2S (B) $AlCl_3$

(C) NaH (D) $MgCl_2$

Co-ordinate or Dative bonding

31. In the coordinate valency

(A) Electrons are equally shared by the atoms

(B) Electrons of one atom are shared with two atoms

(C) Hydrogen bond is formed

(D) None of the above

32. Which of the following contains a coordinate covalent bond

(A) N_2O_5 (B) $BaCl_2$

(C) HCl (D) H_2O

33. A coordinate bond is formed when an atom in a molecule has

(A) Electric charge on it

(B) All its valency electrons shared

(C) A single unshared electron

(D) One or more unshared electron pair

34. Which has a coordinate bond

(A) SO_3^{2-} (B) CH_4

(C) CO_2 (D) NH_3

35. The compound containing co-ordinate bond is

(A) O_3 (B) SO_3

(C) H_2SO_4 (D) All of these

Dipole moment

36. Which of the following is the most polar

(A) CCl_4 (B) $CHCl_3$

(C) CH_3OH (D) CH_3Cl

37. Which one has minimum (nearly zero) dipole moment

(A) Butene-1

(B) *cis* butene-2

(C) *trans* butene-2

(D) 2-methyl-1-propene

38. Which one of the following is having zero dipole moment

(A) CCl_4 (B) CH_3Cl

(C) CH_3F (D) $CHCl_3$

39. Which of the following molecules does not possess a permanent dipole moment

(A) H_2S (B) SO_2

(C) CS_2 (D) SO_3

40. Which of the following has zero dipole moment

(A) CH_2Cl_2 (B) CH_4

(C) NH_3 (D) PH_3

41. Fluorine is more electronegative than either boron or phosphorus. What conclusion can be drawn from the fact that BF_3 has no dipole moment but PF_3 does

(A) BF_3 is not spherically symmetrical but PF_3 is

(B) BF_3 molecule must be linear

(C) The atomic radius of P is larger than the atomic radius of B

(D) The BF_3 molecule must be planar triangular

42. Which molecule does not show zero dipole moment

(A) BF_3 (B) NH_3

(C) CCl_4 (D) CH_4

43. The dipole moment of HBr is $1.6\times10^{-30}\,cm$ and interatomic spacing is $1\mathring{A}$. The % ionic character of HBr is

(A) 7 (B) 10

(C) 15 (D) 27

44. Non-polar solvent is

(A) Dimethyl sulphoxide

(B) Carbon tetrachloride

(C) Ammonia

(D) Ethyl alcohol

45. Which shows the least dipole moment

(A) CCl_4 (B) $CHCl_3$

(C) CH_3CH_2OH (D) CH_3COCH_3

Polarisation and Fajan's rule

46. Which of the following possesses highest melting point
(A) Chlorobenzene (B) *o*-dichlorobenzene
(C) *m*-dichlorobenzene (D) *p*-dichlorobenzene

47. The polar molecule among the following is
(A) CCl_4 (B) CO_2
(C) CH_2Cl_2 (D) $CH_2 = CH_2$

48. Which of the following have both polar and non-polar bonds
(A) C_2H_6 (B) NH_4Cl
(C) HCl (D) $AlCl_3$

49. Which of the following has a high polarising power
(A) Mg^{2+} (B) Al^{3+}
(C) Na^{+} (D) Ca^{2+}

50. Maximum covalent character is associated with the compound
(A) NaI (B) MgI_2
(C) $AlCl_3$ (D) AlI_3

51. Polarisibility of halide ions increases in the order
(A) F^-, I^-, Br^-, Cl^- (B) Cl^-, Br^-, I^-, F^-
(C) I^-, Br^-, Cl^-, F^- (D) F^-, Cl^-, Br^-, I^-

52. According to Fajan's rule, covalent bond is favoured by
(A) Large cation and small anion
(B) Large cation and large anion
(C) Small cation and large anion
(D) Small cation and small anion

53. Which of the following statements is correct
(A) SF_4 is polar and non-reactive
(B) SF_6 is non-polar and very reactive
(C) SF_6 is a strong fluorinating agent
(D) SF_4 is prepared by fluorinating SCl_2 with NaF

54. Choose the correct statement
(A) Amino polarisation is more pronounced by highly charged cation
(B) Small cation has minimum capacity to polarise an anion.
(C) Small anion has maximum polarizability
(D) None of these

55. The ICl molecule is
(A) Purely electrovalent
(B) Purely covalent
(C) Polar with negative end on iodine
(D) Polar with negative end on chlorine

Overlaping- σ and π- bonds

56. The number of sigma and pi bonds in 1-butene-3-yne are
(A) 5 sigma and 5 pi (B) 7 sigma and 3 pi
(C) 8 sigma and 2 pi (D) 6 sigma and 4 pi

57. The most acidic compound among the following is
(A) CH_3CH_2OH (B) C_6H_5OH
(C) CH_3COOH (D) $CH_3CH_2CH_2OH$

58. Which of the following is not correct
(A) A sigma bond is weaker than π bond
(B) A sigma bond is stronger than π bond
(C) A double bond is stronger than a single bond
(D) A double bond is shorter than a single bond

59. Strongest bond formed, when atomic orbitals
(A) Maximum overlap
(B) Minimum overlap
(C) Overlapping not done
(D) None of them

60. The $p - p$ orbital overlapping is present in the following molecule
(A) Hydrogen
(B) Hydrogen bromide
(C) Hydrogen chloride
(D) Chlorine

Hybridisation

61. Octahedral molecular shape exists in ..... hybridisation

(A) sp^3d (B) sp^3d^2

(C) sp^3d^3 (D) None of these

62. The electronic structure of molecule OF_2 is a hybrid of

(A) sp (B) sp^2

(C) sp^3 (D) sd^3

63. Percentage of s-character in sp^3 hybrid orbital is

(A) 25 (B) 50

(C) 66 (D) 75

64. Shape of XeF_4 molecule is

(A) Linear (B) Pyramidal

(C) Tetrahedral (D) Square planar

65. For which of the following hybridisation the bond angle is maximum

(A) sp^2 (B) sp

(C) sp^3 (D) dsp^2

66. The $C-H$ bond distance is the longest in

(A) C_2H_2 (B) C_2H_4

(C) $C_2H_4Br_2$ (D) C_6H_6

67. The nature of hybridization in CH_2Cl-CH_2Cl for carbon is

(A) sp (B) sp^2

(C) sp^3 (D) sp^2d

68. Shape of methane molecule is

(A) Tetrahedral (B) Pyramidal

(C) Octahedral (D) Square planer

69. Which one amongst the following possesses an sp hybridized carbon in its structure

(A) $CH_2=C.Cl-CH=CH_2$

(B) $C.Cl_2=C.Cl_2$

(C) $CH_2=C=CH_2$

(D) $CH_2=CH-CH=CH_2$

70. Which of the following is the correct electronic formula of chlorine molecule

(A) $:\ddot{\underset{\ddot{}}{Cl}}:\ddot{\underset{\ddot{}}{Cl}}:$ (B) $:\ddot{\underset{\ddot{}}{Cl}}^-::\ddot{\underset{\ddot{}}{Cl}}^+:$

(C) $:\ddot{\underset{\ddot{}}{Cl}}:\ddot{\underset{\ddot{}}{Cl}}:$ (D) $:\ddot{\underset{\ddot{}}{Cl}}::\ddot{\underset{\ddot{}}{Cl}}:$

71. Which of the following molecules can central atom said to adopt sp^2 hybridization

(A) BeF_2 (B) BCl_3

(C) C_2H_2 (D) NH_3

72. In $\left[Cu\left(NH_3\right)_4\right]SO_4,;Cu$ has following hybridization

(A) dsp^2 (B) sp^3

(C) sp^2 (D) sp^3d^2

73. The hybridization of carbon atoms in $C-C$ single bond of $HC\equiv C-CH=CH_2$ is

(A) sp^3-sp^3 (B) sp^2-sp^3

(C) $sp-sp^2$ (D) sp^3-sp

74. The compound in which C^* uses sp^3 hybrids for bond formation is

(A) $H\overset{+}{C}OOH$ (B) $(NH_2)_2\overset{+}{C}O$

(C) $(NH_3)_3\overset{+}{C}OH\ HgCl_2$ (D) $CH_3\overset{+}{C}HO$

75. In diborane, the $H-B-H$ bond angle is 120^o. The hybridization of boron is likely to be

(A) sp (B) sp^2

(C) sp^3 (D) dsp^2

76. CCl_4 has the hybridisation

(A) sp^3d (B) dsp^2

(C) sp (D) sp^3

77. Compound having planar symmetry is

(A) H_2SO_4 (B) H_2O

(C) HNO_3 (D) CCl_4

78. Which of the following compounds is not linear

(A) $SnCl_2$ (B) HCl

(C) CO_2 (D) $HgCl_2$

79. Which one of the following statements is true for ammonium ion
(A) All bonds are ionic
(B) All bonds are coordinate covalent
(C) H atoms are situated at the corners of a square
(D) H atoms are situated at the corners of a tetrahedron

80. The bond angle in sp^2 hybridisation is
(A) 180^o (B) 120^o
(C) 90^o (D) $109^o 2'$

81. The correct order towards bond angle is
(A) $sp < sp^2 < sp^3$
(B) $sp^2 < sp < sp^3$
(C) $sp^3 < sp^2 < sp$
(D) Bond angle does not depend on hybridisation

82. The geometry and the type of hybrid orbital present about the central atom in BF_3 is
(A) Linear, sp
(B) Trigonal planar, sp^2
(C) Tetrahedral, sp^3
(D) Pyramidal, sp^3

83. In graphite, electrons are
(A) Localised on every third C atom
(B) Present in antibonding orbital
(C) Localised on each C atom
(D) Spread out between the structure

84. The ammonium ion is
(A) Tetrahedral
(B) Trigonal pyramidal
(C) Square planar
(D) Square pyramidal

85. In sp hybridisation, shape is
(A) Angular (B) Tetrahedral
(C) Bipyramidal (D) Linear

86. In which of the following species is the interatomic bond angle is $109^o 28'$
(A) NH_3, $(BF_4)^{-1}$ (B) $(NH_4)^+$, BF_3
(C) NH_3, BF_4 (D) $(NH_2)^{-1}$, BF_3

87. A square planar complex is formed by hybridisation of which atomic orbitals
(A) s, p_x, p_y, d_{yz} (B) s, p_x, p_y, $d_{x^2-y^2}$
(C) s, p_x, p_y, d_{z^2} (D) s, p_y, p_z, d_{xy}

88. In benzene, all the six $C-C$ bonds have the same length because of
(A) Tautomerism (B) sp^2 hybridisation
(C) Isomerism (D) Inductive effect

89. The bond energies of $H-H$ and $Cl-Cl$ are 430 kJ mol^{-1} and 242 kJ mol^{-1} respectively, ΔH_t for HCl is 91 $kJ\ mol^{-1}$. The bond energy of HCl will be
(A) 427 kJ (B) 766 kJ
(C) 285 kJ (D) 245 kJ

90. Which of the following has dsp^2 hybridization
(A) $NiCl_4^{2-}$ (B) SCl_4
(C) NH_4^+ (D) $PtCl_4^{2-}$

91. Which one of the following is a planar molecule
(A) NH_3 (B) H_3O^+
(C) BCl_3 (D) PCl_3

92. Which one of the following is a correct set with respect to molecule, hybridisation and shape
(A) $BeCl_2$, sp^2, linear
(B) $BeCl_2$, sp^2, triangular planar
(C) BCl_3, sp^2, triangular planar
(D) BCl_3, sp^3, tetrahedral

93. Which of the following compounds doesn't have linear structure
(A) CO_2 (B) SO_2
(C) $BeCl_2$ (D) C_2H_2

94. Which of the following bonds require the largest amount of bond energy to dissociate the atom concerned
(A) $H-H$ bond in H_2
(B) $C-C$ bond in CH_4
(C) $N \equiv N$ bond in N_2
(D) $O=O$ bond in O_2

95. The percentage *s*-character of the hybrid orbitals in methane, ethene and ethyne are respectively

(A) 25, 33, 50 (B) 25, 50, 75

(C) 50, 75, 100 (D) 10, 20, 40

96. Which set hydridisation is correct for the following compounds

NO_2, SF_4 PF_6^-

(A) sp, sp^2, sp^3

(B) sp, sp^3d, sp^3d^2

(C) sp^2, sp^3, d^2sp^3

(D) sp^3, sp^3d^2, sp^3d^2

97. The state of hybridisation of B in BCl_3 is

(A) sp (B) sp^2

(C) sp^3 (D) sp^2d^2

98. The hybrid state of sulphur in SO_3 molecule is

(A) sp^3d (B) sp^3

(C) sp^3d^2 (D) sp^2

99. Which of the following molecules has pyramidal shape

(A) PCl_3 (B) SO_3

(C) CO_3^{2-} (D) NO_3^-

100. The hybrdization of IF_7 is

(A) sp^3d^3 (B) sp^2d

(C) d^2sp^3 (D) sp^3

Resonance

101. Which does not show resonance

(A) Benzene (B) Aniline

(C) Ethyl amine (D) Toluene

102. The enolic form of acetone contains

(A) 9 sigma bonds, 1 pi bond and 2 lone pairs

(B) 8 sigma bonds, 2 pi bonds and 2 lone pairs

(C) 10 sigma bonds, 1 pi bond and 1 lone pair

(D) 9 sigma bonds, 2 pi bonds and 1 lone pair

103. Point out incorrect statement about resonance

(A) Resonance structures should have equal energy

(B) In resonance structures, the constituent atoms should be in the same position

(C) In resonance structures, there should not be the same number of electron pairs

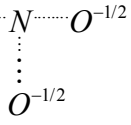
(D) Resonance structures should differ only in the location of electrons around the constituent atoms

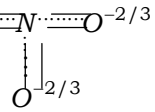
104. The number of possible resonance structures for CO_3^{2-} is

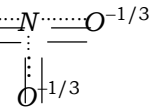
(A) 2 (B) 3

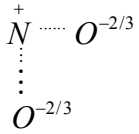
(C) 6 (D) 9

105. Resonance hybrid of nitrate ion is

(A) 

(B) 

(C) 

(D) 

VSEPR Theory

106. A molecule which contains unpaired electrons is

(A) Carbon monoxide

(B) Molecular nitrogen

(C) Molecular oxygen

(D) Hydrogen peroxide

107. H_2O is

(A) A linear triatomic molecule

(B) A bent (angular) triatomic molecule

(C) Both of these

(D) None of these

108. Bond angle between two hybrid orbitals is 105^o.% s-orbital character of hybrid orbital is
(A) Between $20-21\%$
(B) Between $19-20\%$
(C) Between $21-22\%$
(D) Between $22-23\%$

109. The bond angle between H – O – H in ice is closest to
(A) $120^o 28'$ (B) 60^o
(C) 90^o (D) 105^o

110. Which of the following molecules does not have a linear arrangement of atoms
(A) H_2S (B) C_2H_2
(C) BeH_2 (D) CO_2

111. BCl_3 is a planar molecule while NCl_3 is pyramidal, because
(A) BCl_3 has no lone pair of electrons but NCl_3 has a lone pair of electrons
(B) $B-Cl$ bond is more polar than $N-Cl$ bond
(C) Nitrogen atom is smaller than boron atom
(D) $N-Cl$ bond is more covalent than $B-Cl$ bond

112. The isoelectronic pair is
(A) Cl_2O, ICl_2^- (B) ICl_2^-,ClO_2
(C) IF_2^+, I_3^- (D) ClO_2^-, ClF_2^+

113. According to VSEPR theory, the most probable shape of the molecule having 4 electron pairs in the outer shell of the central atom is
(A) Linear (B) Tetrahedral
(C) Hexahedral (D) Octahedral

114. The molecular shapes of SF_4, CF_4 and XeF_4 are
(A) The same with 2, 0 and 1 lone pairs of electrons on the central atom, respectively
(B) The same with 1, 1 and 1 lone pair of electrons on the central atoms, respectively
(C) Different with 0, 1 and 2 lone pairs of electrons on the central atom, respectively
(D) Different with 1, 0 and 2 lone pairs of electrons on the central atom, respectively

115. Which of the following species is planar
(A) CO_3^{2-} (B) NH_2
(C) PCl_3 (D) None of these

Molecular orbital theory

116. In P_4O_{10}, the number of oxygen atoms attached to each phosphorus atom is
(A) 2 (B) 3
(C) 4 (D) 2.5

117. Of the following statements which one is correct
(A) Oxygen and nitric oxide molecules are both paramagnetic because both contain unpaired electrons
(B) Oxygen and nitric oxide molecules are both diamagnetic because both contain no unpaired electrons
(C) Oxygen is paramagnetic because it contains unpaired electrons, while nitric oxide is diamagnetic because it contains no unpaired electrons
(D) Oxygen is diamagnetic because it contains no unpaired electrons, while nitric oxide is paramagnetic because it contains an unpaired electron

118. According to the molecular orbital theory, the bond order in C_2 molecule is
(A) 0 (B) 1
(C) 2 (D) 3

119. The molecular orbital configuration of a diatomic molecule is

$$\sigma\, 1s^2\ \sigma^*\, 1s^2\ \sigma\, 2s^2\ \sigma^*\, 2s^2\ \sigma\, 2p_x^2 \begin{cases} \pi\, 2p_y^2 \\ \pi\, 2p_z^2 \end{cases}$$

Its bond order is
(A) 3 (B) 2.5
(C) 2 (D) 1

120. The difference in energy between the molecular orbital formed and the combining atomic orbitals is called
(A) Bond energy
(B) Activation energy
(C) Stabilization energy
(D) Destabilization energy

121. According to molecular orbital theory, the paramagnetism of O_2 molecule is due to presence of
(A) Unpaired electrons in the bonding σ molecular orbital
(B) Unpaired electrons in the antibonding σ molecular orbital
(C) Unpaired electron in the bonding π molecular orbital
(D) Unpaired electrons in the antibonding π molecular orbital

122. The bond order in O_2^+ is
(A) 2 (B) 2.5
(C) 1.5 (D) 3

123. Which of the following is paramagnetic
(A) O_2 (B) CN^-
(C) CO (D) NO^+

124. If N_x is the number of bonding orbitals of an atom and N_y is the number of antibonding orbitals, then the molecule/atom will be stable if
(A) $N_x > N_y$ (B) $N_x = N_y$
(C) $N_x < N_y$ (D) $N_x \le N_y$

125. Which of the following molecular orbitals has two nodal planes
(A) $\sigma 2s$ (B) $\pi 2p_y$
(C) $\pi^* 2p_y$ (D) $\sigma^* 2p_x$

126. The bond order in CO_3^{2-} ion between $C-O$ is
(A) Zero (B) 0.88
(C) 1.33 (D) 2

127. The bond order of O_2^+ is the same as in
(A) N_2^+ (B) CN^-
(C) CO (D) NO^+

128. Bond order of O_2 is
(A) 2 (B) 1.5
(C) 3 (D) 3.5

129. The total number of electron that takes part in forming bonds in N_2 is
(A) 2 (B) 4
(C) 6 (D) 10

130. The bond length the species O_2, O_2^+ and O_2^- are in the order of
(A) $O_2^+ > O_2 > O_2^-$ (B) $O_2^+ > O_2^- > O_2$
(C) $O_2 > O_2^+ > O_2^-$ (D) $O_2^- > O_2 > O_2^+$

131. According to molecular orbital theory which of the following statement about the magnetic character and bond order is correct regarding O_2^+
(A) Paramagnetic and bond order< O_2
(B) Paramagnetic and bond order> O_2
(C) Dimagnetic and bond order< O_2
(D) Dimagnetic and bond order> O_2

132. The bond order in NO is 2.5 while that in NO^+ is 3. Which of the following statements is true for these two species
(A) Bond length in NO^+ is equal to that in NO
(B) Bond length in NO is greater than in NO^+
(C) Bond length in NO^+ is greater than in NO
(D) Bond length is unpredictable

133. Which of the following is diamagnetic
(A) Oxygen molecule (B) Boron molecule
(C) N_2^+ (D) None

134. Bond energies in NO, NO^+ and NO^- are such as
(A) $NO^- > NO > NO^+$ (B) $NO > NO^- > NO^+$
(C) $NO^+ > NO > NO^-$ (D) $NO^+ > NO^- > NO$

135. Which of the following is paramagnetic
(A) B_2 (B) C_2
(C) N_2 (D) F_2

Hydrogen bonding

136. The relatively high boiling point of HF is due to
(A) Hydrogen bonding
(B) Covalent bonding
(C) Unshared electron pair on F
(D) Being a halogen acid

137. Water is liquid due to
(A) Hydrogen bonding
(B) Covalent bond
(C) Ionic bond
(D) Vander Waals forces

138. The maximum possible number of hydrogen bonds in which an H_2O molecule can participate is
(A) 1 (B) 2
(C) 3 (D) 4

139. Hydrogen bonding is maximum in
(A) Ethanol (B) Diethyl ether
(C) Ethyl chloride (D) Triethyl amine

140. The hydrogen bond is strongest in
(A) Water (B) Ammonia
(C) Hydrogen fluoride (D) Acetic acid

141. The high boiling point of ethanol (78.2^oC) compared to dimethyl ether (-23.6^oC), though both having the same molecular formulae C_6H_6O, is due to
(A) Hydrogen bonding
(B) Ionic bonding
(C) Coordinate covalent bonding
(D) Resonance

142. Methanol and ethanol are miscible in water due to
(A) Covalent character
(B) Hydrogen bonding character
(C) Oxygen bonding character
(D) None of these

143. B.P. of $H_2O(100^oC)$ and $H_2S(-42^oC)$ explained by
(A) Vander Waal's forces
(B) Covalent bond
(C) Hydrogen bond
(D) Ionic bond

144. Strength of hydrogen bond is intermediate between
(A) Vander Waal and covalent
(B) Ionic and covalent
(C) Ionic and metallic
(D) Metallic and covalent

145. In which of the following compounds intramolecular hydrogen bond is present
(A) Ethyl alcohol
(B) Water
(C) Salicylaldehyde
(D) Hydrogen sulphide

Types of bonding and Forces in solid

146. Which has weakest bond
(A) Diamond (B) Neon (Solid)
(C) KCl (D) Ice

147. Which of the following exhibits the weakest intermolecular forces
(A) He (B) HCl
(C) NH_3 (D) H_2O

148. Glycerol has strong intermolecular bonding therefore it is
(A) Sweet (B) Reactive
(C) Explosive (D) Viscous

149. Among the following the weakest one is
(A) Metallic bond (B) Ionic bond
(C) Van der Waal's force (D) Covalent bond

150. Lattice energy of alkali metal chlorides follows the order
(A) $LiCl > NaCl > KCl > RbCl > CsCl$
(B) $CsCl > NaCl > KCl > RbCl > LiCl$
(C) $LiCl > CsCl > NaCl > KCl > RbCl$
(D) $NaCl > LiCl > KCl > RbCl > CsCl$