*** Chemistry** **[480]**

1. Match List I with List II.

List I (Compound)	List II (Shape/geometry)
A. NH_3	I. Trigonal Pyramidal
B. BrF_5	II. Square Planar
C. XeF_4	III. Octahedral
D. SF_6	IV. Square Pyramidal

Choose the correct answer from the options given below:

(A) $A-II, B-IV, C-III, D-I$ (B) $A-III, B-IV, C-I, D-II$

(C) $A-II, B-III, C-IV, D-I$ (D) $A-I, B-IV, C-II, D-III$

2. Identify the correct answer.

(A) BF_3 has non-zero dipole moment

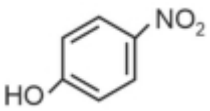
(B) Dipole moment of NF_3 is greater than that of NH_3

(C) Three canonical forms can be drawn for CO_3^{2-} ion

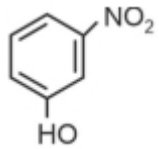
(D) Three resonance structures can be drawn for ozone

3. Intramolecular hydrogen bonding is present in

(A)

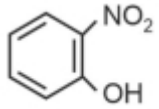


(B)



(C) HF

(D)



4. The number of σ bonds, π bonds and lone pair of electrons in pyridine, respectively are:

(A) $12, 2, 1$ (B) $11, 2, 0$ (C) $12, 3, 0$ (D) $11, 3, 1$

5. Amongst the following the total number of species NOT having eight electrons around central atom in its outermost shell, is $NH_3, AlCl_3, BeCl_2, CCl_4, PCl_5$:

(A) 1 (B) 3 (C) 2 (D) 4

6. The correct order of energies of molecular orbitals of N_2 molecule, is

(A) $\sigma 1s < \sigma^* 1s < \sigma 2s < \sigma^* 2s < (\pi 2p_x = \pi 2p_y) < (\pi^* 2p_x = \pi^* 2p_y) < \sigma 2p_z < \sigma^* 2p_z$

(B) $\sigma 1s < \sigma^* 1s < \sigma 2s < \sigma^* 2s < (\pi 2p_x = \pi 2p_y) < \sigma 2p_z < (\pi^* 2p_x = \pi^* 2p_y) < \sigma^* 2p_z$

(C) $\sigma 1s < \sigma^* 1s < \sigma 2s < \sigma^* 2s < \sigma 2p_z < (\pi 2p_x = \pi 2p_y) < (\pi^* 2p_x = \pi^* 2p_y) < \sigma^* 2p_z$

(D) $\sigma 1s < \sigma^* 1s < \sigma 2s < \sigma^* 2s < \sigma 2p_z < \sigma^* 2p_z < (\pi 2p_x = \pi 2p_y) < (\pi^* 2p_x = \pi^* 2p_y)$

7. Amongst the following which one will have maximum 'lone pair - lone pair' electron repulsions?

(A) IF_5 (B) SF_4 (C) XeF_2 (D) ClF_3

8. $\mathrm{BF_3}$ is planar and electron deficient compound. Hybridization and number of electrons around the central atom, respectively are:

(A) $\mathrm{sp^3}$ and 4 (B) $\mathrm{sp^3}$ and 6 (C) $\mathrm{sp^2}$ and 6 (D) $\mathrm{sp^2}$ and 8

9. Match List$-I$ with List$-II$.

List$-II$	List$-II$
(a) PCl_5	(i) Square pyramidal
(b) SF_6	(ii) Trigonal planar
(c) BrF_5	(iii) Octahedral
(d) BF_3	(iv) Trigonal bipyramidal

Choose the correct answer from the options given below.

(A) $(a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)$

(B) $(a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)$

(C) $(a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)$

(D) $(a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)$

10. Which of the following set of molecules will have zero dipole moment?

(A) Boron trifluoride, beryllium difluoride, carbon dioxide, $1,4-$dichlorobenzene

(B) Ammonia, beryllium difluoride, water, $1,4-$dichlorobenzene

(C) Boron trifluoride, hydrogen fluoride, carbon dioxide, $1,3-$dichlorobenzene

(D) Nitrogen trifluoride, beryllium difluoride, water, $1,3-$dichlorobenzene

11. Match the coordination number and type of hybridisation with distribution of hybrid orbitals in space based on Valence bond theory.

Coordination number and type of hybridisation	Distribution of hybrid orbitals In space
$(a)\ 4, sp^3$	(i) trigonal bipyramidal
$(b)\ 4, dsp^2$	(ii) octahedral
$(c)\ 5, sp^3d$	(iii) tetrahedral
$(d)\ 6, d^2sp^3$	(iv) square planar

Select the correct option

(A) $(a)-(iii)(b)-(i)(c)-(iv)(d)-(ii)$

(B) $(a)-(ii)(b)-(iii)(c)-(iv)(d)-(i)$

(C) $(a)-(iii)(b)-(iv)(c)-(i)(d)-(ii)$

(D) $(a)-(iv)(b)-(i)(c)-(ii)(d)-(iii)$

12. Among the compounds shown below which one revealed a linear structure?

(A) N_2O (B) NO_2 (C) $HOCl$ (D) O_3

13. Identify the wrongly match pair.

Molecule	Shape or geometry of molecule
(A) NH_3	Trigonal pyramidal
(B) PCl_5	Trigonal planar
(C) SF_6	Octahedral
(D) $BeCl_2$	Linear

14. Match the compounds of Xe in column I with the molecular structure in column II.

Column - I	Column - II
$(a)\ XeF_2$	(i) Van Arkel method
$(b)\ XeF_4$	(ii) Linear
$(c)\ XeO_3$	(iii) Square pyramidal
$(d)\ XeOF_4$	(iv) Pyramidal

(A) $(a)-(ii)(b)-(i)(c)-(iv)(d)-(iii)$

(B) $(a)-(ii)(b)-(i)(c)-(iii)(d)-(iv)$

(C) $(a)-(ii)(b)-(iv)(c)-(iii)(d)-(i)$

(D) $(a)-(ii)(b)-(iii)(c)-(i)(d)-(iv)$

15. Identify a molecule which does not exist.

(A) O_2 (B) He_2 (C) Li_2 (D) C_2

16. The calculated spin only magnetic moment of Cr^{2+} Ion is..... $B.M.$

(A) 2.84 (B) 3.87 (C) 4.90 (D) 5.92

17. Which of the following diatomic molecular species has only π bonds according to Molecular Orbital Theory?

(A) O_2 (B) N_2 (C) C_2 (D) Be_2

18. Which of the following is paramagnetic ?

(A) N_2 (B) H_2 (C) Li_2 (D) O_2

19. Which of the following is the correct order of dipole moment ?

(A) $\mathrm{NH_3 < BF_3 < NF_3 < H_2O}$

(B) $\mathrm{BF_3 < NF_3 < NH_3 < H_2O}$

(C) $\mathrm{BF_3 < NH_3 < NF_3 < H_2O}$

(D) $\mathrm{H_2O < NF_3 < NH_3 < BF_3}$

20. Which of the following pairs of compounds is isoelectronic and isostructural ?

(A) TeI_2, XeF_2 (B) $BeCl_2, XeF_2$ (C) IF_3, XeF_2 (D) IBr_2^-, XeF_2

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

(A) O_2, NO^+ (B) CN^-, CO (C) N_2, O_2^- (D) CO, NO

22. Predict the correct order among the following :

(A) bond pair $-$ bond pair $>$ lone pair $-$ bond pair $>$ lone pair $-$ lone pair

(B) lone pair $-$ bond pair $>$ bond pair $-$ bond pair $>$ lone pair $-$ lone pair

(C) lone pair $-$ lone pair $>$ lone pair $-$ bond pair $>$ bond pair $-$ bond pair

(D) lone pair $-$ lone pair $>$ bond pair $-$ bond pair $>$ lone pair $-$ bond pair

23. 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

24. In which of the following pairs, both the species are not isostructural ?

(A) Diamond, Silicon carbide (B) NH_3, PH_3

(C) $XeF_4, XeO4$ (D) $SiCl_4, PCl_4^+$

25. Which of the following options represents the correct bond order?

(A) $O_2^- > O_2 < O_2^+$ (B) $O_2^- < O_2 > O_2^+$ (C) $O_2^- > O_2 > O_2^+$ (D) $O_2^- < O_2 < O_2^+$

26. Which of the following molecules has the maximum dipole moment ?

(A) CO_2 (B) CH_4 (C) NH_3 (D) NF_3

27. Identify the correct order of solubility in aqueous medium.

(A) $Na_2S > CuS > ZnS$ (B) $Na_2S > ZnS > CuS$

(C) $CuS > ZnS > Na_2S$ (D) $ZnS > Na_2S > CuS$

28. The outer orbitals of C in ethene molecule can be considered to be hybridized to give three equivalent sp^2 orbitals. The total number of sigma (σ) and pi (π) bonds in ethene molecule is

(A) 3 sigma (σ) and 2 pi (π) bonds

(B) 4 sigma (σ) and 1 pi (π) bonds

(C) 5 sigma (σ) and 1 pi (π) bonds

(D) 1 sigma (σ) and 2 pi (π) bonds.

29. XeF_2 is isostructural with

(A) $SbCl_3$ (B) $BaCl_2$ (C) TeF_2 (D) ICl_2^-

30. Which of the following is a polar molecule ?

(A) SiF_4 (B) XeF_4 (C) BF_3 (D) SF_4

31. Which of the following is paramagnetic ?

(A) CN^- (B) NO^+ (C) CO (D) O_2^-

32. In which of the following ionization processes the bond energy increases and the magnetic behaviour changes from paramagnetic to diamagnetic.

(A) $O_2 \rightarrow O_2^+$ (B) $C_2 \rightarrow C_2^+$ (C) $NO \rightarrow NO^+$ (D) $N_2 \rightarrow N_2^+$

33. Dipole-induced dipole interactions are present in which of the following pairs

(A) HCl and He atoms (B) SiF_4 and He atoms

(C) H_2O and alcohol (D) Cl_2 and CCl_4

34. The pair of species that has the same bond order in the following is

(A) CO, NO^+ (B) NO^-, CN^- (C) O_2, N_2 (D) O_2, B_2

35. Nodal plane in a ethylene molecule is

(A) Parallel to the bond axis

(B) Prependicular to the bond axis

(C) In the molecular plane

(D) None of these

36. Match list I with list II and select the correct answer

list I (species)	list II ($O-N-O$ angle)
$(A)\ NO_2^+$	$(1)\ 180^o$
$(B)\ NO_2$	$(2)\ 132^o$
$(C)\ NO_2^-$	$(3)\ 120^o$

$(D)\ NO_3^-$	$(4)\ 115^o$
	$(5)\ 109^o$

(A) $A-5,\ B-4,\ C-3,\ D-2$

(B) $A-5,\ B-2,\ C-4,\ D-3$

(C) $A-1,\ B-2,\ C-4,\ D-3$

(D) $A-1,\ B-4,\ C-3,\ D-2$

37. According to $VSEPR$ theory

(A) the shape of the molecule depends upon the bonded electron pairs

(B) pair of electrons attract each other in valence shells

(C) the pairs of electrons tend to occupy such positions that minimise repulsions

(D) the pairs of electrons tend to occupy such positions that minimise distances from each other

38. A molecule of the type AX_5 has square pyramidal geometry hence number of lone pairs on $'A'$ is

(A) 1 (B) 2 (C) 3 (D) 4

39. Which of the following is planar due to back bonding

(A) BF_3 (B) $N(CH_3)_3$ (C) $N(SiH_3)_3$ (D) PF_3

40. Which of the following properties correctly explain SiO_2

(A) Linear, basic (B) Tetrahedral, acidic

(C) Tetrahedral, basic (D) Linear, acidic

41. Which of the following species is non linear?

(A) ICl_2^- (B) I_3^- (C) N_3^- (D) ClO_2^-

42. Assertion : Bond angle of H_2S is smaller than H_2O.
Reason : Electronegativity of the central atom increases, bond angle decreases.

(A) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.

(B) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.

(C) If the Assertion is correct but Reason is incorrect.

(D) If both the Assertion and Reason are incorrect.

43. A molecule which contains unpaired electrons is

(A) Carbon monoxide (B) Molecular nitrogen

(C) Molecular oxygen (D) Hydrogen peroxide

44. The bond order of NO molecule is

(A) 1 (B) 2 (C) 2.5 (D) 3

45. The bond order in N_2^+ ion is

(A) 1 (B) 2 (C) 2.5 (D) 3

46. Which of the following molecule is paramagnetic

(A) Chlorine (B) Nitrogen (C) Oxygen (D) Hydrogen

47. Which molecule has the highest bond order

(A) N_2 (B) Li_2 (C) He_2 (D) O_2

48. Which one of the following is paramagnetic

(A) H_2O (B) NO_2 (C) SO_2 (D) CO_2

49. According to the molecular orbital theory, the bond order in C_2 molecule is

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

50. The bond order in O_2^+ is

(A) 2 (B) 2.5 (C) 1.5 (D) 3

51. Which of the following molecular orbitals has two nodal planes

(A) $\sigma\, 2s$ (B) $\pi\, 2p_y$ (C) $\pi^*\, 2p_y$ (D) $\sigma^*\, 2p_x$

52. What is correct sequence of bond order

(A) $O_2^+ > O_2^- > O_2$ (B) $O_2^+ > O_2 > O_2^-$ (C) $O_2 > O_2^- > O_2^+$ (D) $O_2^- > O_2^+ > O_2$

53. The bond order is not three for

(A) N_2^+ (B) O_2^{2+} (C) N_2 (D) NO^+

54. Which of the following is correct for N_2 triple bond

(A) $3s$ (B) $1p, 2s$ (C) $2p, 1s$ (D) $3p$

55. The paramagnetic property of the oxygen molecule due to the presence of unpaired electorns present in

(A) $(\sigma 2p_x)^1$ and $(\sigma^* 2p_x)^1$ (B) $(\sigma 2p_x)^1$ and $(\pi 2p_y)^1$

(C) $(\pi^* 2p_y)^1$ and $(\pi^* 2p_z)^1$ (D) $(\pi^* 2p_y)^1$ and $(\pi 2p_y)^1$

56. The bond order of O_2^+ is the same as in

(A) N_2^+ (B) CN^- (C) CO (D) NO^+

57. Bond order of O_2 is

(A) 2 (B) 1.5 (C) 3 (D) 3.5

58. What is not true about ice?

(A) It has open cage like structure

(B) It has less density than water

(C) Each O atom is surrounded by $4\, H$ atoms

(D) Each O atom has four $H-$ bonds around it

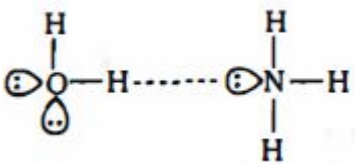
59. Which of the following when dissolved in water forms a solution which is non-conducting?

(A) Green vitriol (B) Chile or Indian salt petre

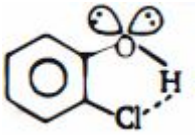
(C) Alcohol (D) Potash alum

60. Which of the following is not a best representation of the $H-$ bond?

(A)



(B)



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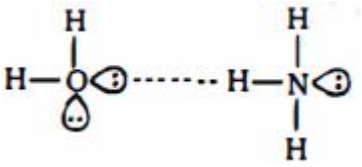
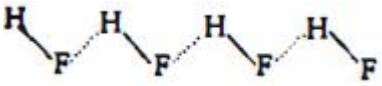


(D) None

61. The $H-$ bonds in solid HF can be best represented as

(A) $H-F-H-F-H-F$

(B)



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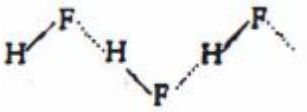
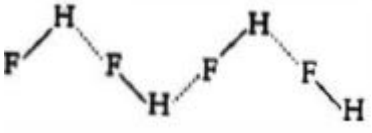


(D)



62. Hydrogen bonding present in

(A) KHF_2 (B) KH_2PO_4 (C) KH_2PO_2 (D) Both (A) and (B)

63. The hydrogen bond is not present in

(A) phenol (B) liquid HCl

(C) water (D) liquid NH_3

64. Which of the following form dimer by $H-$ bond

(A) CH_3COOH (B) H_2SO_4 (C) $AlCl_3$ (D) $o-$ nitrophenol

65. Which one of the following does not have intermolecular $H-$ bonding ?

(A) H_2O (B) $O-$ nitro phenol (C) HF (D) CH_3COOH

66. In a crystal cations and anions are held together by

(A) Electrons (B) Electrostatic forces

(C) Nuclear forces (D) Covalent bonds

67. The enhanced force of cohesion in metals is due to

(A) The covalent linkages between atoms

(B) The electrovalent linkages between atoms

(C) The lack of exchange of valency electrons

(D) The exchange energy of mobile electrons

68. Which of the following has the highest melting point

(A) Pb (B) Diamond (C) Fe (D) Na

69. Which has weakest bond

(A) Diamond (B) Neon (Solid) (C) KCl (D) Ice

70. Glycerol has strong intermolecular bonding therefore it is

(A) Sweet (B) Reactive (C) Explosive (D) Viscous

71. Which of the following does not exists as ionic substance in solid state

(A) PBr_5 (B) N_2O_5 (C) Na_2SO_4 (D) H_2O

72. Dipole-induced dipole interactions are present in which of the following pairs

(A) SiF_4 and $He\,atoms$ (B) H_2O and $alcohol$

(C) Cl_2 and CCl_4 (D) $HCl\,and\,He\,atoms$

73. Among the following mixture dipole-dipole attraction is present ?

(A) CH_2Cl_2 and CCl_4 (B) He and He

(C) $CHCl_3$ and CH_2Cl_2 (D) C_6H_6 and CH_4

74. The boiling points of noble gases are illustrative of the operation of forces of the type

(A) ion-dipole (B) dipole-induced dipole

(C) ion-induced dipole (D) London dispersion forces

75. The bond that exists between NH_3 and BF_3 is called

(A) Electrovalent (B) Covalent (C) Coordinate (D) Hydrogen

76. Which of the following does not have a coordinate bond

(A) SO_2 (B) HNO_3 (C) H_2SO_3 (D) HNO_2

77. Which has a coordinate bond

(A) SO_3^{2-} (B) CH_4 (C) CO_2 (D) NH_3

78. The compound containing co-ordinate bond is

(A) O_3 (B) SO_3 (C) H_2SO_4 (D) All of these

79. The number of dative bonds in sulphuric acid molecules is

(A) 2 (B) 1 (C) 0 (D) 4

80. Which of the following compounds has coordinate (dative) bond

(A) CH_3NC (B) CH_3OH (C) CH_3Cl (D) NH_3

81. The structure of orthophosphoric acid is

(A) $H-O-\overset{\overset{O}{\uparrow}}{\underset{\underset{H}{|}}{\underset{|}{\underset{O}{|}}{P}}}-O-H$

(B) $O\leftarrow\overset{\overset{H}{|}}{\underset{\underset{H}{|}}{\underset{|}{\underset{O}{|}}{P}}}-O-H$

(C) $O\leftarrow\overset{\overset{H}{|}}{\underset{\underset{H}{|}}{\underset{|}{\underset{H}{|}}{P}}}-O-H$

(D) $H-O-\overset{\overset{O}{\uparrow}}{P}=O$

82. What is the nature of the bond between B and O in $(C_2H_5)_2OBH_3$

(A) Covalent (B) Co-ordinate covalent

(C) Ionic bond (D) Banana shaped bond

83. The number of ionic, covalent and coordinate bonds in NH_4Cl are respectively

(A) $1,3\,and\,1$ (B) $1,3\,and\,2$ (C) $1,2\,and\,3$ (D) $1,1\,and\,3$

84. The bonds in $K_4\,[Fe(CN)_6]$ are

(A) All ionic

(B) All covalent

(C) Ionic and covalent

(D) Ionic, covalent and coordinate covalent

85. Dative bond is present in

(A) O_3 (B) NH_3 (C) $BaCl_2$ (D) BI_3

86. Bonds present in N_2O_5 (nitrogen pentaoxide) are

(A) only ionic (B) only covalent

(C) covalent and co-ordinate (D) covalent and ionic

87. Which of the following does not contain any co- ordinate bond?

(A) H_3O^+ (B) BF_4^- (C) HF_2^- (D) NH_4^+

88. The $d-$ orbitals which are involved in hybridisation of central atom in ICl_4^-

(A) $d_{z^2}, d_{x^2-y^2}$ (B) $d_{x^2-y^2}, d_{xy}, d_{yz}, d_{zx}$ (C) $d_z^2, d_{xy}, d_{yz}, d_{xz}$ (D) d_{xy}, d_{xz}, d_{yz}

89. In a regular octahedral molecule MX_6, the number of $X-M-X$ bonds of 180^o are :-

(A) 3 (B) 2 (C) 6 (D) 4

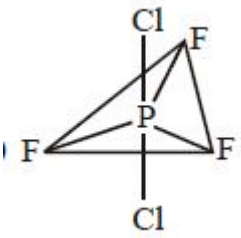
90. If Hund's rule is violated then select the $CORRECT$ statement regarding $[Ni(NH_3)_6]^{2+}$ is

(A) sp^3d^2 , paramagnetic (B) d^2sp^3 , diamagnetic

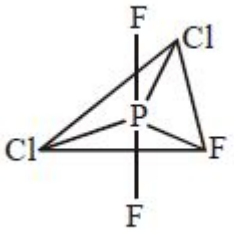
(C) sp^3d^2 , diamagnetic (D) d^2sp^3 , paramagnetic

91. Choose the correct structure for PF_3Cl_2 molecule. (electron Affenity : $Cl > F$)

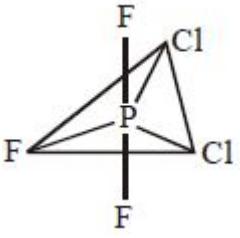
(A)



(B)



(C)



(D) $(B)\ and\ (C)$ both

92. Molecular shape of XeF_3^+ and SNF_3 species are respectively

(A) $T-$ shaped, Tetrahedral

(B) $T-$ shape, square pyramidal

(C) See-saw, square pyramidal

(D) Square pyramidal, see-saw

93. Match the species given in Column I with the shape given in column II and mark the correct option:-

Column-I	Column-II (Shape)
$(A)\ SF_4$	(1) Tetrahedral
$(B)\ BrF_3$	(2) Pyramidal
$(C)\ BrO_3^-$	(3) Sea-Saw shaped
$(D)\ NH_4^+$	(4) Bent $T-$ shaped

(A) $A(3), B(2), C(1), D(4)$ (B) $A(3), B(4), C(2), D(1)$

(C) $A(1), B(2), C(3), D(4)$ (D) $A(1), B(4), C(3), D(2)$

94. Match List $-I$ with List $-II$ and select the correct answer using the codes given below the lists

List$-I$	List$-II$
$(I)\ XeF_4$	(A) See-saw
$(II)\ I_3^-$	(B) Tetra hedral
$(III)\ XeO_2F_2$	(C) Bond angle 90^o
$(IV)\ SO_4^{2-}$	(D) Linear

(A) $(I)-(C), II-(D), III-(A), IV-(B)$

(B) $(I)-(B), II-(A), III-(C), IV-(D)$

(C) $(I)-(C), II-(B), III-(A), IV-(D)$

(D) $(I)-(A), II-(C), III-(B), IV-(D)$

95. $BeCl_2$ is not isostructural with

(A) ICl_2^- (B) C_2H_2 (C) XeF_2 (D) $GeCl_2$

96. Which of the following statements is incorrect for PCl_5 ?

(A) Its three $P-Cl$ bond lengths are equal

(B) It involves sp^3d hybridization

(C) It has an regular geometry

(D) Its shape is trigonal bipyramidal

97. Give the correct order of initials T or F for following statements. Use T if statement is true and F if it is false :

(I) The order of repulsion between different pair of electrons is $l_P - l_P > l_P - b_P > b_P - b_P$

(II) In general, as the number of lone pair of electrons on central atom increases, value of bond angle from normal bond angle also increases

(III) The number of lone pair on O in H_2O is 2 while on N in NH_3 is 1

(IV) The structures of xenon fluorides and xenon oxyfluorides could not be explained on the basis of $VSEPR$ theory

(A) $TTTF$ (B) $TFTF$ (C) $TFTT$ (D) $TFFF$

98. Which species is planar?

(A) CO_3^{2-} (B) SO_3^{2-} (C) ClO_3^- (D) BF_4^-

99. Among the following species, the least angle around the central atom is in

(A) O_3 (B) I_3^- (C) NO_2^- (D) PH_3

100. Which ionic compound has the largest amount of lattice energy?

(A) NaF (B) AlF_3 (C) AlN (D) MgF_2

101. Iodine molecules are held in the solid lattice by .....

(A) London forces (B) dipole-dipole interactions

(C) covalent bonds (D) coulombic force

102. Carbon dioxide is gas, while SiO_2 is solid because

(A) CO_2 is a linear molecule, while SiO_2 is angular

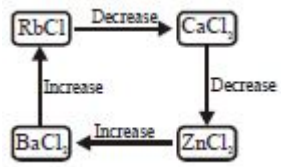
(B) van der Waals' forces are very strong in SiO_2

(C) CO_2 is covalent, while SiO_2 is ionic

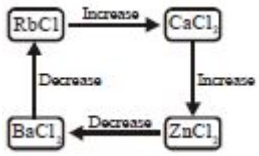
(D) Si cannot form stable bonds with O, hence Si has to form a $3D$ lattice

103. Which of the following diagram show correct change in the ionic character of given compounds according to Fajans rule ?

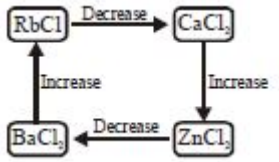
(A)



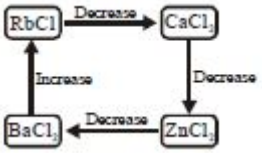
(B)



(C)

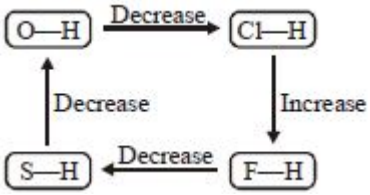


(D)

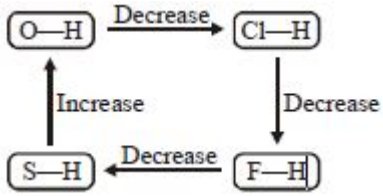


104. Which of the following diagrams shows correct change in the polarity of bond ?

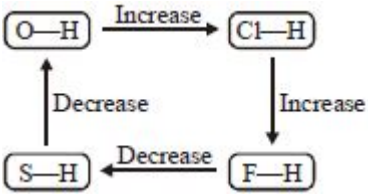
(A)



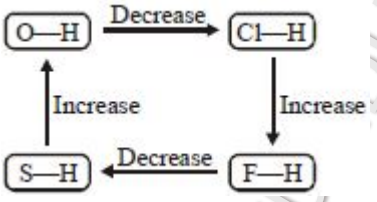
(B)



(C)



(D)



105. Which of the following is the correct order for increasing bond angle ?

(A) $NH_3 < PH_3 < AsH_3 < SbH_3$

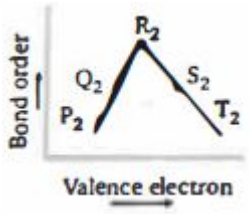
(B) $H_2O < OF_2 < Cl_2O$

(C) $H_3Te^+ < H_3Se^+ < H_3S^+ < H_3O^+$

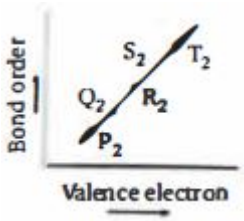
(D) $BF_3 < BCl_3 < BBr_3 < BI_3$

106. If P to T are second period $p-$ block elements then which of the following graph show correct relation between valence electrons in P_2 to T_2 (corresponding molecules) and their bond order is

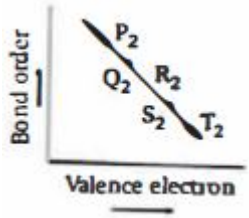
(A)



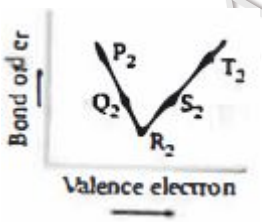
(B)



(C)

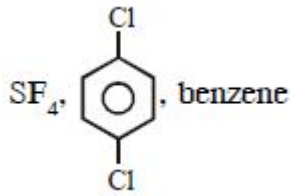


(D)

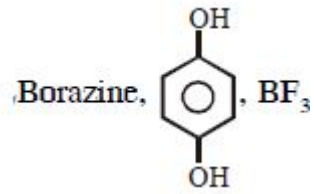


107. Which set contain molecules with $\mu = 0$

(A)

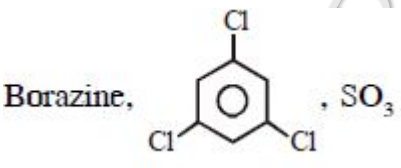


(B)



(C) ClF_3, SiF_4, SO_3

(D)

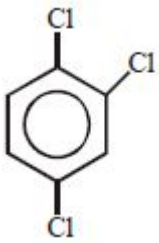
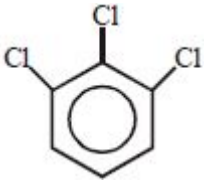
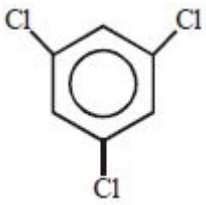


108. The magnetic moment of M^{x+} (atomic number $= 25$) is $\sqrt{15}\,BM$. The number of unpaired electrons and the value of x, respectively, are

(A) $4,3$ (B) $3,4$ (C) $3,2$ (D) $5,2$

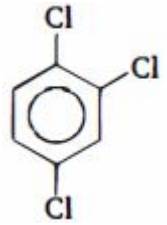
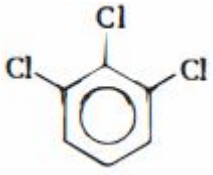
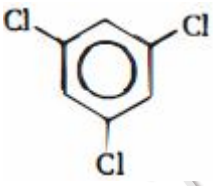
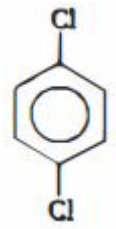
109. Which has maximum dipole moment ?

(A) (B) (C) (D)


110. Which has maximum dipole moment?

(A) (B) (C) (D)

111. The dipole moment of HCl is $1.03\,D$, if $H-Cl$ bond distance is $1.26\,\overset{o}{A}$, what is the percentage of ionic character in the $H-Cl$ bond? ..... %

(A) 60 (B) 39 (C) 29 (D) 17

112. Select correct statement (s)

(A) Acidic strength of $HBr > HCl$ but reverse is true for their reducing property

(B) Basic strength of $PH_3 > AsH_3$ but reverse is true for their bond angle

(C) Dipole moment of $CH_3Cl > CH_3F$ but reverse is true for their $H\hat{C}H$ bond angle

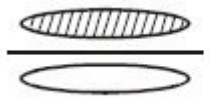
(D) K_{a_1} of fumaric acid is higher than maleic acid but reverse is true for their K_{a_2}

113. The percentage Ionic character of the HBr molecule, if the dipole moment is $0.63\,D$ & HBr bond length $187.5\,Pm$ is ?..... %

(A) 17 (B) 7 (C) 27 (D) 47

114. Which one of the following sketch is not correctly matched ?

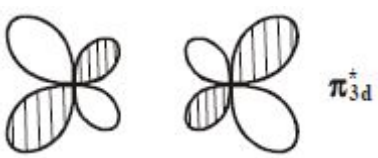
(A)



(B)

(C)

(D)



115. In which of the following species $p\pi = d\pi$ bond is present but $p\pi = p\pi$ bond is absent ?

(A) SiH_4 (B) CS_2 (C) SO_2 (D) SO_2Cl_2

116. The hybridization of the central atom will change when

(A) NH_3 combines with H^+ (B) H_3BO_3 combines with OH^-

(C) NH_3 forms NH_2^- (D) H_2O combines with H^+

117. Which of the following overlapping is not present in XeO_3 molecule ?

(A) $sp^3 + p_x$ (B) $sp^3 + p_y$ (C) $d_{xy} + p_x$ (D) $sp^3 + s$

118. Which is correct statement?

As the $s-$ character of a hybrid orbital decreases

(I) The bond angle decreases (II) The bond strength increases

(III) The bond length increases (IV) Size of orbitals increases

(A) $(I), (III)$ and (IV) (B) $(II), (III)$ and (IV)

(C) (I) and (II) (D) All are correct

119. Assuming the bond direction to the z -axis, which of the overlapping of atomic orbitals of two atom (A) and (B) will result in bonding?

$(I)\, s-$ orbital of A and P_x -orbital of B

$(II)\, s-$ orbital of A and P_z orbital of B

$(Ill)\, p_y$ -orbital of A and p_z orbital of B

$(IV)\, s-$ orbital of both (A) and (B)

(A) I and IV (B) I and II (C) III and IV (D) II and IV

120. The correct order of $Cl-O$ bond order is

(A) $ClO_3^- < ClO_4^- < ClO_2^- < ClO^-$ (B) $ClO^- < ClO_4^- < ClO_3^- < ClO_2^-$

(C) $ClO^- < ClO_2^- < ClO_3^- < ClO_4^-$ (D) $ClO_4^- < ClO_3^- < ClO_2^- < ClO^-$

----- Challenges are opportunities in disguise: Don't be discouraged by obstacles. View them as chances to learn, grow, and become stronger -----