Date Planned : __ / __ / __	Daily Tutorial Sheet - 6	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	JEE Advanced (Archive)	Exact Duration :_________

76. Using VSEPR theory, draw the shape of PCl_5 and BrF_5. **(2003)**

77. Number of lone pair(s) in $XeOF_4$ is(are) : **(2004)**

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

78. On the basis of ground state electronic configuration, arrange the following molecules in increasing $O-O$ bond length order. $KO_2, O_2, O_2[AsF_6]$. **(2004)**

79. Draw the shape of XeF_4 and OSF_4 according to VSEPR theory. Show the lone pair of electrons on the central atom. **(2004)**

80. According to MO Theory, **(2004)**

(A) O_2^+ is paramagnetic and bond order greater than O_2

(B) O_2^+ is paramagnetic and bond order less than O_2

(C) O_2^+ is diamagnetic and bond order is less than O_2

(D) O_2^+ is diamagnetic and bond order is more than O_2

81. Predict whether the following molecules are isostructural or not. Justify your answer. **(2005)**

(i) NMe_3 **(ii)** $N(SiMe_3)_3$

82. Which species has the maximum number of lone pair of electrons on the central atom ? **(2005)**

(A) $CaCO_3$ **(B)** XeF_4 **(C)** SF_4 **(D)** KI_3

83. Among the following, the paramagnetic compound is : **(2007)**

(A) Na_2O_2 **(B)** O_3 **(C)** N_2O **(D)** KO_2

84. The species having bond order different from that in CO is : **(2007)**

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

85. Match each of the diatomic molecules in Column I with its property/properties in Column II. **(2009)**

Column I		Column II	
(A)	B_2	**(p)**	Paramagnetic
(B)	N_2	**(q)**	Undergoes oxidation
(C)	O_2^-	**(r)**	Undergoes reduction
(D)	O_2	**(s)**	Bond order ≥ 2
		(t)	Mixing of 's' and 'p' orbitals

86. Assuming that Hund's rule is violated, the bond order and magnetic nature of the diatomic molecule C_2 is : **(2010)**

(A) 2 and diamagnetic **(B)** 0 and diamagnetic

(C) 1 and paramagnetic **(D)** 0 and paramagnetic

87. Based on VSEPR theory, the number of 90 degree F – Br – F angles in BrF_5 is ________. **(2010)**

88. The species having pyramidal shape is : **(2010)**

(A) SO_3 **(B)** BrF_3 **(C)** SiO_3^{2-} **(D)** OSF_2

***89.** Which one of the following molecules is expected to exhibit diamagnetic behavior? **(2013)**

(A) C_2 **(B)** N_2 **(C)** O_2 **(D)** S_2

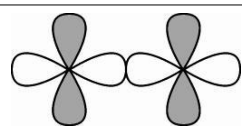
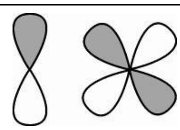
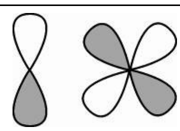
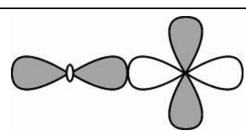
90. Assuming 2s-2p mixing is NOT operative, the paramagnetic species among the following is : **(2014)**

(A) Be_2 **(B)** B_2 **(C)** C_2 **(D)** N_2

***91.** Hydrogen bonding plays a central role in which of the following phenomena? **(2014)**

(A) Ice floats in water
(B) Higher Lewis basicity of primary amines than tertiary amines in aqueous solutions
(C) Formic acid is more acidic than acetic acid
(D) Dimerisation of acetic acid in benzene

92. Match the orbital overlap figure in List I with the description given in List II and select the correct answer using the code given below the lists. **(2014)**

	Column I		**Column II**
(p)		**(1)**	p – d π-antibonding
(q)		**(2)**	d – d σ-bonding
(r)		**(3)**	p – d π-bonding
(s)		**(4)**	d – d σ-antibonding

Code :

	p	**q**	**r**	**s**		**p**	**q**	**r**	**s**
(A)	2	1	3	4	**(B)**	4	3	1	2
(C)	2	3	1	4	**(D)**	4	1	3	2

93. Among the triatomic molecules/ions, $BeCl_2$, N_3^-, N_2O, NO_2^+, O_3, SCl_2, ICl_2^-, I_3^- and XeF_2, the total number of linear molecule(s)/ ion(s) where the hybridization of the central atom does not have contribution from the d-orbital(s) is ________.
[Atomic number: S = 16, Cl = 17, I = 53 and Xe = 54] **(2015)**

***94.** The compound(s) with two lone pairs of electrons on the central atom is(are) : **(2016)**

(A) BrF_5 **(B)** ClF_3 **(C)** XeF_4 **(D)** SF_4

***95.** According to Molecular Orbital Theory, **(2016)**

(A) C_2^{2-} is expected to be diamagnetic

(B) O_2^{2+} is expected to have a longer bond length than O_2

(C) N_2^{+} and N_2^{-} have the same bond order

(D) He_2^{+} has the same energy as two isolated He atoms

96. The sum of the number of lone pair of electrons on each central atom in the following species is

$[TeBr_6]^{2-}$, $]BrF_2]^{2+,}$ SNF_3, and $[XeF_3]^{-}$ **(2017)**

(Atomic number : N = 7, F = 9, S = 16, Br = 35, Te = 52, Xe = 54)

97. Among H_2, He_2^{+}, Li_2, Be_2, B_2, C_2, N_2, O_2^{-} and F_2 , the number of diamagnetic species is _________.

(Atomic number : H = 1, He = 2, Li = 3, Be = 4, B = 5, C = 6, N = 7, O = 8, F = 9) **(2017)**

98. Each of the following options contains a set of four molecules. Identify the option(s) where all four molecules possess permanent dipole moment at room temperature. **(2019)**

(A) BF_3, O_3, SF_6, XeF_6

(B) $BeCl_2, CO_2, BCl_3, CHCl_3$

(C) $NO_2, NH_3, POCl_3, CH_3Cl$

(D) $SO_2, C_6H_5Cl, H_2Se, BrF_5$