PREVIOUS YEARS' QUESTIONS EXERCISE-II

1. Which of the following molecules\ions does not contain unpaired electrons? **[AIEEE-2006]**

(1) N_2^+ (2) O_2 (3) O_2^{2-} (4) B_2

2. Among the following mixtures, dipole-dipole as the major interaction, is present in **[AIEEE-2006]**

(1) KCl and water
(2) benzene and carbon tetrachloride
(3) benzene and ethanol
(4) acetonitrile and acetone

3. In which of the following molecules/ions are all the bonds **not** equal? **[AIEEE-2006]**

(1) XeF_4 (2) BF_4^-
(3) SF_4 (4) SiF_4

4. The decreasing values of bond angles from NH_3 (106°) to SbH_3 (91°) down group-15 of the periodic table is due to **[AIEEE-2006]**

(1) decreasing lp – bp repulsion
(2) increasing electronegativity
(3) increasing bp – bp repulsion
(4) increasing p-orbital character in sp^3

5. In which of the following ionizion processes, the bond order has increased and the magnetic behaviour has changed **[AIEEE-2007]**

(1) $NO \rightarrow NO^+$ (2) $O_2 \rightarrow O_2^+$
(3) $N_2 \rightarrow N_2^+$ (4) $C_2 \rightarrow C_2^+$

6. Which of the following hydrogen bonds is the strongest **[AIEEE-2007]**

(1) F–H.....F (2) O–H.....O
(3) O–H.....F (4) O–H.....N

7. Which of the following species exhibits the diamagnetic behaviour **[AIEEE-2007]**

(1) O_2^+ (2) O_2 (3) NO (4) O_2^{2-}

8. The charge/size ratio of a cation determines its polarizing power. Which one of the following sequences represent the increasing order of the polarizing power of the cationic species, K^+, Ca^{+2}, Mg^{+2}, Be^{+2} **[AIEEE-2007]**

(1) $Be^{+2} < K^+ < Ca^{+2} < Mg^{+2}$
(2) $K^+ < Ca^{+2} < Mg^{+2} < Be^{+2}$
(3) $Ca^{+2} < Mg^{+2} < Be^{+2} < K^+$
(4) $Mg^{+2} < Be^{+2} < K^+ < Ca^{+2}$

9. Using MO theory predict which of the following species has the shortest bond length? **[AIEEE-2009]**

(1) O_2^- (2) O_2^{2-} (3) O_2^{2+} (4) O_2^+

10. The hybridisation of orbitals of N atom in NO_3^-, NO_2^+ and NH_4^+ are respectively:- **[AIEEE-2011]**

(1) sp, sp^3, sp^2 (2) sp^2, sp^3, sp
(3) sp, sp^2, sp^3 (4) sp^2, sp, sp^3

11. The structure of IF_7 is :- **[AIEEE-2011]**

(1) octahedral
(2) pentagonal bipyramid
(3) square pyramid
(4) trigonal bipyramid

12. Among the following the maximum covalent character is shown by the compound :- **[AIEEE-2011]**

(1) $AlCl_3$ (2) $MgCl_2$
(3) $FeCl_2$ (4) $SnCl_2$

13. Which of the following has maximum number of lone pairs associated with Xe ? **[AIEEE-2011]**

(1) XeO_3 (2) XeF_4
(3) XeF_6 (4) XeF_2

14. The number of types of bonds between two carbon atoms in calcium carbide is :- **[AIEEE-2005, 2011]**

(1) One sigma, two pi (2) One sigma, one pi
(3) Two sigma, one pi (4) Two sigma, two pi

15. Ortho-Nitrophenol is less soluble in water than p– and m– Nitrophenols because :- **[AIEEE-2005, 2012]**

(1) Melting point of o–Nitrophenol is lower than those of m– and p– isomers
(2) o–Nitrophenol is more volatile in steam than those of m– and p– isomers
(3) o–Nitrophenol shows Intramolecular H–bonding
(4) o–Nitrophenol shows Intermolecular H–bonding

16. The molecule having smallest bond angle is :- **[AIEEE-2012]**

(1) PCl_3 (2) NCl_3
(3) $AsCl_3$ (4) $SbCl_3$

17. In which of the following pairs the two species are not isostructural ? **[AIEEE-2012]**

(1) AlF_6^{3-} and SF_6 (2) CO_3^{2-} and NO_3^-
(3) PCl_4^+ and $SiCl_4$ (4) PF_5 and BrF_5

18. Among the following species which two have trigonal bipyramidal shape ? **[AIEEE-2012 (Online)]**

(I) NI_3 (II) I_3^-

(III) SO_3^{2-} (IV) NO_3^-

(1) II and III (2) III and IV

(3) I and IV (4) None of them

19. Among the following, the species having the smallest bond is :- **[AIEEE-2012 (Online)]**

(1) NO (2) NO^+ (3) O_2 (4) NO^-

20. Based on lattice energy and other considerations, which one of the following alkali metal chloride is expected to have the highest melting point ? **[AIEEE-2012 (Online)]**

(1) RbCl (2) LiCl (3) KCl (4) NaCl

21. Which of the following has the square planar structure ? **[AIEEE-2012 (Online)]**

(1) NH_4^+ (2) CCl_4

(3) XeF_4 (4) BF_4^-

22. The compound of Xenon with zero dipole moment is :- **[AIEEE-2012 (Online)]**

(1) XeO_3 (2) XeO_2

(3) XeF_4 (4) $XeOF_4$

23. Among the following the molecule with the lowest dipole moment is :- **[AIEEE-2012 (Online)]**

(1) $CHCl_3$ (2) CH_2Cl_2

(3) CCl_4 (4) CH_3Cl

24. The formation of molecular complex $BF_3 - NH_3$ results in a change in hybridisation of boron :- **[AIEEE-2012 (Online)]**

(1) from sp^3 to sp^3d

(2) from sp^2 to dsp^2

(3) from sp^3 to sp^2

(4) from sp^2 to sp^3

25. Which one of the following molecules is expected to exhibit diamagnetic behaviour ? **[JEE (MAIN) 2013]**

(1) C_2 (2) N_2

(3) O_2 (4) S_2

26. In which of the following pairs of molecules/ions, both the species are not likely to exist ? **[JEE (MAIN) 2013]**

(1) H_2^+, He_2^{2-} (2) H_2^-, He_2^{2-}

(3) H_2^{2+}, He_2 (4) H_2^-, He_2^{2+}

27. Stability of the species Li_2, Li_2^- and Li_2^+ increases in the order of :- **[JEE (MAIN) 2013]**

(1) $Li_2 < Li_2^+ < Li_2^-$

(2) $Li_2^- < Li_2^+ < Li_2$

(3) $Li_2 < Li_2^- < Li_2^+$

(4) $Li_2^- < Li_2 < Li_2^+$

28. Which one of the following properties is **not** shown by NO ? **[JEE (MAIN) 2014]**

(1) It combines with oxygen to form nitrogen dioxide

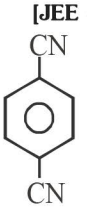
(2) It's bond order is 2.5

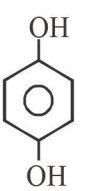
(3) It is diamagnetic in gaseous state

(4) It is a neutral oxide

29. For which of the following molecule significant $\mu \neq 0$? **[JEE (MAIN) 2014]**

(a) 

(b) 

(c) 

(d) 

(1) Only (c) (2) (c) and (d)

(3) Only (a) (4) (a) and (b)

30. Which of the following species is not paramagnetic :- **[JEE (MAIN) 2017]**

(1) NO (2) CO

(3) O_2 (4) B_2

PREVIOUS YEARS QUESTIONS	ANSWER KEY									Exercise-II
Que.	1	2	3	4	5	6	7	8	9	10
Ans.	**3**	**4**	**3**	**4**	**1**	**1**	**4**	**2**	**3**	**4**
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	**2**	**1**	**4**	**1**	**3**	**4**	**4**	**4**	**2**	**4**
Que.	21	22	23	24	25	26	27	28	29	30
Ans.	**3**	**3**	**3**	**4**	**1,2**	**3**	**2**	**3**	**2**	**2**