INORGANIC CHEMISTRY **TIME :30 Min**

Single Correct

1. Which of the following exhibit sp mixing ?

(A) O_2^{2+} (B) O_2 (C) N_2^{2-} (D) All of the above

2. Which of the following is paramagnetic & B.O. is not in fractional value

(A) NO (B) N_2^{2+} (C) N_2^{2-} (D) All of the above

3. Which of the following species contain fractional bond order.

(A) H_2 (B) NO (C) F_2 (D) N_2

4. Which of the following have intra molecular H-bonding.

(A) Salicylic acid (B) o-nitrophenol

(C) Salicylaldehyde (D) All of these

5. The CORRECT order of boiling point of the following pair of species is :

(A) $CCl_4 < SiCl_4$ (B) $NF_3 < NMe_3$

(C) $ICl < Br_2$ (D) $D_2O < H_2O$

6. Consider the following four xenon compounds: XeF_4, XeF_2, XeO_3, XeO_2F_2.
The pair of xenon compounds expected to have non-zero dipolemoment is

(A) XeF_4 and XeO_3 (B) XeO_3 and XeF_2

(C) XeO_3 and XeO_2F_2 (D) XeO_2F_2 and XeF_4

7. The potential energy of intermolecular interaction in solid ICl is proportional to

(A) $\frac{1}{r^4}$ (B) $\frac{1}{r^6}$ (C) $\frac{1}{r^3}$ (D) $\frac{1}{r}$

8. Which intermolecular force is most responsible in allowing Xenon gas to liquify?

(A) Ionic (B) London dispersion force

(C) Dipole-dipole (D) Ion-dipole

9. Which one of the following alkaline earth metal sulphate has largest cation :-

(A) $BaSO_4$ (B) $SrSO_4$ (C) $CaSO_4$ (D) $BeSO_4$

10. The CORRECT order of C–O bond length in $CO_3^{-2}, CO_2, HCO_2^-, CO$:-

(A) $CO > CO_3^{-2} > HCO_2^- > CO_2$ (B) $CO_3^{-2} > HCO_2^- > CO_2 > CO$

(C) $HCO_2^- > CO_2 > CO_3^{-2} > CO$ (D) None of these

11. Which of the following set contain peroxy linkage :-

(A) HNO_4, $H_2S_2O_8$ (B) $H_2S_2O_5$, $H_4P_2O_7$

(C) $H_2S_2O_7$, $H_4P_2O_8$ (D) $H_4P_2O_5$, $H_4P_2O_6$

Multiple Correct

12. Identity the INCORRECT statement(s) for the hydrolysis of P_4O_{10} when treated with excesss of water.

(A) Tetrametaphosphorous acid is formed as one of product during process

(B) Final product is tribasic oxyacid

(C) One of the intermediate product has four P–O–P linkage

(D) Maximum basicity of intermediate product is 4 (out of all intermediate product form in reaction)

13. Which of the following compounds show intermolecular hydrogen bonding?

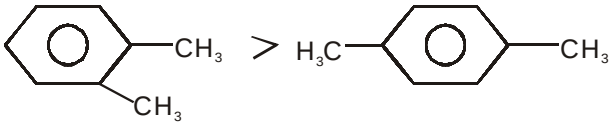
(A) Ortho chlorophenol (B) Chloral

(C) Meta hydroxybenzaldehyde (D) Para hydroxybenzaldehyde

14. Select the CORRECT order of boiling point?

(A) $BMe_3 > BF_3$

(B) iso-pentane > neo-pentane

(C)  $>$

(D) $D_2O > H_2O$

Paragraph Type

The cation polarises the anion, pulling the electronic charge toward itself and thereby increasing the electronic charge between the two. This is precisely what happens in a covalent bond, i.e., buildup of electron charge density between the nuclei. The polarising power of the cation, the polarisability of the anion and the extent of distortion (polarisation) of anion are the factors, which determine the per cent covalent character of the ionic bond.

Polarisation of anion is used to compare the covalent and ionic character of molecule, compare the nature of oxide, compare the electrical conductivity of ionic comopounds, tendency of the formation of complex compounds, compare the thermal stability of metal salts, compare the intensity of colour of compounds, compare the solubility of heavier metal halide in water.

15. Identify the INCORRECT order

(A) AgF < AgCl < AgBr (solubility in water) (B) NaF < MgF_2 < AlF_3 (melting point)

(C) ZnS < CdS < HgS (intensity of colour) (D) BeO < MgO < CaO (basic character)

16. Identify the pair in which first cation having greater complex formation tendency.

(A) (Ba^{+2}, Be^{+2}) (B) (Fe^{+2}, Fe^{+3}) (C) (Be^{+2}, Li^{+}) (D) (Ca^{+2}, Zn^{+2})

Paragraph

In the heavier elements of p-block elements, however as we expect form the "inert pair effect, the lower oxidation state becomes more common on descending the group."

Covalent nature in ionic compound is explained on the basis of polarisation effect.

17. Which of the following compound is most covalent nature?

(A) $SnCl_2$ (B) $CaCl_2$ (C) $SnCl_4$ (D) $InCl_3$

18. The CORRECT order of stability is :

(A) $Sn^{2+} > Sn^{4+}$ (B) $Pb^{2+} > Pb^{+4}$ (C) $Tl^{+3} > Tl^{\oplus}$ (D) $Bi^{3+} < Bi^{5+}$

Matix Match Type

1.

	Column-I Oxy acid		Column-II
(A)	Pyrosulphurous acid	(P)	Basicity = 2
(B)	Peroxydisulphuric acid	(Q)	S–S linkage is present
(C)	dithionic acid	(R)	difference in oxidation state of sulphur atoms is zero
(D)	Pyrosulphuric acid	(S)	S–O–S linkage is present
		(T)	atleast one sulphur atom have +3 oxidation state

Integer

1. Find the sum of bond order in that given species which have fractional bond order.

NO, O_2^-, N_2, $H_2^{\oplus}$, CO, C_2^{-2}, O_2, CO_3^{-2}

2. Find the number of chemical species having greater boiling point than He

H_2, Ne , Ar , Kr , SiO_2 , NaCl, T_2 , D_2