**CLASS : ADV_CC** **CHEMICAL BONDING**

***Single correct :***

Q.1 Release energy due to HF--------HF interaction in Kcal/mol is
(A) 1 (B) 10 (C) 100 (D) 1000

Q.2 Which diatomic molecule has maximum bond energy ?
(A) $B_2$ (B) $C_2$ (C) $O_2$ (D) $F_2$

Q.3 Which is correct order of dipole moment ?
(A) $H_2O > NF_3 > BF_3$ (B) $BF_3 > H_2O > NF_3$
(C) $NF_3 > H_2O > BF_3$ (D) $BF_3 > NF_3 > H_2O$

Q.4 Which is **correct** combination for molecules ?

| | **Inter molecular forces** | **Boiling point** | **$\Delta H_{vap}$** |
|---|---|---|---|
| (A) | weak | low | low |
| (B) | weak | low | high |
| (C) | strong | high | low |
| (D) | strong | low | low |

Q.5 Select **incorrect** match

| | **Oxide** | **Type of solid** | **Nature** |
|---|---|---|---|
| (A) | $Na_2O$ | Giant ionic | Basic |
| (B) | $Al_2O_3$ | Giant ionic | Amphoteric |
| (C) | $SiO_2$ | Molecular | Acidic |
| (D) | $SO_2$ | Molecular | Acidic |

Q.6 For given reaction pair of $AB_x$ is

$$2AB_x \underset{\text{on cooling}}{\rightleftharpoons} A_2B_{2x} \underset{\text{on cooling}}{\rightleftharpoons} [AB_{x-1}]^+[AB_{x+1}]^-$$

(A) $ClO_3$, $NO_2$ (B) $PCl_5$, $NO_2$ (C) NO, $PCl_5$ (D) $ClO_3$, NO

Q.7 Pair of chloride compounds show conductivity in molten state as well as in aqueous medium is/are
(A) NaCl, $MgCl_2$ (B) $MgCl_2$, $AlCl_3$ (C) NaCl, $AlCl_3$ (D) All

Q.8 Which property does not follow given order $H_2O < D_2O$
(i) Viscosity (ii) Melting point (iii) Boiling point (iv) Enthalpy of vapourization
(A) only (iv) (B) only (iii) and (iv) (C) only (ii), (iii), (iv) (D) None of these

Q.9 The reaction that **does not** produce chlorine :
(A) Heating of $NH_4ClO_4$ (B) Heating of $FeCl_3 . 6H_2O$
(C) Heating CuO + HCl(g) (D) Decomposition of $NCl_3$

Q.10 Polarity of which of the following molecule changes when it undergoes lewis-acid base interaction with a $F^-$ ion ?
(A) $BF_3$ (B) $PF_5$ (C) $ClF_3$ (D) $XeF_4$

Q.11 Select **correct** statement

(A) The hydrogen bond in $KHF_2$ is stronger than that in liquid HF

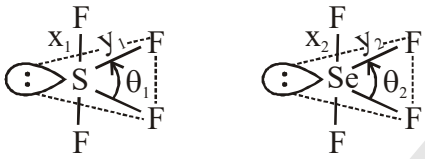
(B) The dipole moment of $CH_3F$ is greater than that of $CH_3Cl$

(C) $sp^2$ hybrid orbitals can produce linear molecular geometry

(D) Only one type of bond is present in $B_2H_6$

Q.12 **Incorrect** order for following structure is

[where $x_1$, $x_2$, $y_1$ and $y_2$ are bond length, $\theta_1$ and $\theta_2$ are bond angle ]




(A) $x_1 < x_2$ (B) $y_1 < y_2$ (C) $x_2 > x_1 > y_2$ (D) $\theta_1 > \theta_2$

Q.13 Which of the following order is **incorrect** regarding bond length ?

(A) $NO^+ < NO$ (B) $CO^+ > CO$ (C) $N_2^+ > N_2$ (D) None of these

Q.14 Oxyacid having reducing property and can undergo tautomeric change

(A) $H_3PO_3$ (B) $H_3BO_3$ (C) $H_4SiO_4$ (D) $HClO_3$

Q.15 Match the ionization processes listed in column-I with the changes observed as listed in column-II. For this, use the codes given below

| | **Column-I** | | **Column-II** |
|---|---|---|---|
| (A) | $N_2 \rightarrow N_2^+$ | (P) | Bond order increases and magnetic nature is changed. |
| (B) | $O_2^+ \rightarrow O_2^{2+}$ | (Q) | Bond order decreases and magnetic nature is not changed. |
| (C) | $B_2 \rightarrow B_2^+$ | (R) | Bond order increases and magnetic nature is not changed. |
| (D) | $NO^- \rightarrow NO$ | (S) | Bond order decreases and magnetic nature is changed. |

| | **A** | **B** | **C** | **D** | | **A** | **B** | **C** | **D** |
|---|---|---|---|---|---|---|---|---|---|
| (A) | S | R | P | Q | (B) | S | P | Q | R |
| (C) | R | Q | S | P | (D) | P | S | Q | R |

***More than one may be correct***

Q.16 Which molecular orbital(s) is/are differently formed in $N_2$ and $O_2$ molecules.

(A) $\sigma 2p$ (B) $\pi 2p$ (C) $\sigma^* 2p$ (D) $\pi^* 2p$

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Q.19 Which pair of compound can reacts with each other

(A) $PF_5$, CsF (B) $XeF_6$, $CF_4$ (C) RbBr, $BaBr_2$ (D) HF, NaF

Q.20 Select **correct** order(s)

(A) Temperature of maximum density : $H_2O < D_2O$

(B) Boiling point : $1^o > 2^o > 3^o$ for isomeric amines

(C) Ionization constant $[H^+]\,[OH^-]$ : $H_2O > D_2O$

(D) Vapour pressure at R.T. : $NH_3 < HF < H_2O < H_2O_2$

Q.21 **Incorrect** order(s) of basic character
(A) $SnO > Ag_2O$ (B) $HgO > ZnO$ (C) $Fe_2O_3 > Cr_2O_3$ (D) $Ag_2O > Cu_2O$

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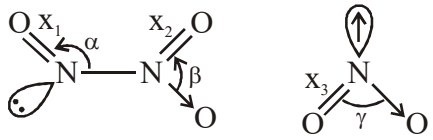

(A) $x_2 > x_1$ (B) $\gamma > \beta$ (C) $\beta > \alpha$ (D) $x_2 > x_3$

***Subjective***

Q.23 Find the sum of oxygen atoms which are directly bonded with a silicon atom and an aluminium atom in a alumino silicates.

Q.24 Find the value of expression [x – y] for $(BF_2)_2\,B(BF_2)_2\,B(BF_2)_2$.
where
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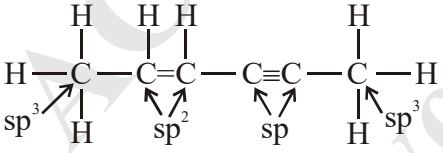

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Find the value of expression [x – y].

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$NX_3$, $NX_5$, $PX_3$, $PX_5$, $OX_2$, $OX_4$, $SX_2$, $SX_4$, $IX_7$, $IX_5$, $IX_3$, IX

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Find out the value of expression |x – y| for above reaction
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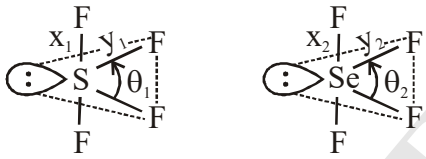


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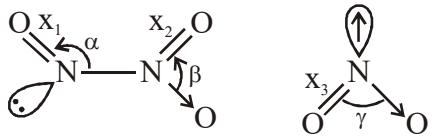

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Ans. 8

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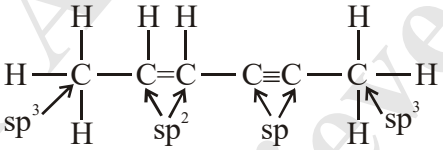

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Find the value of expression [x – y].

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Ans. 4

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Ans. 4