RACE # 17 PHYSICAL CHEMISTRY

MAX. TIME : 60 Min.

1. Calculate 'n' factor of following acids -

(i) HCl (ii) H_3PO_2 (iii) H_3PO_3 (iv) H_3PO_4

(v) HCOOH (vi) HNO_2 (vii) $H_4P_2O_7$ (viii) CO_2

(ix) SO_3 (x) N_2O_5

2. Calculate 'n' factor of following bases -

(i) $Mn(OH)_2$ (ii) $Al(OH)_3$ (iii) NH_4OH (iv) $Zn(OH)_2$

(v) $Sr(OH)_2$ (vi) NH_3 (vii) Na_2O (viii) MgO

(ix) K_2O (x) Al_2O_3

3. Calculating n-factor of the following as oxidising agent -

(i) $Cr_2O_7^{2-}$ (ii) CrO_4^{2-} (iii) H_2O_2 (iv) O_3

(v) CH_4 (In combustion reaction) (vi) C_3H_8(In combustion reaction)

(vii) F_2 (viii) MnO_4^- (basic medium)

(ix) HNO_3 (converting into N_2O)

(x) Cl_2O_5 (converting into Cl^-)

4. Calculate n-factor of the following as reducing agent

(i) $H_2C_2O_4$ (ii) $Na_2C_2O_4$

(iii) $H_2C_2O_4 \cdot KHC_2O_4$ (iv) FeC_2O_4

(v) $H_2C_2O_4.2NaHC_2O_4.2H_2O$ (vi) H_2O_2

(vii) HCl (viii) KNO_2

(ix) $Na_2S_2O_3$ (in the change : $S_2O_3^{2-} \rightarrow S_4O_6^{2-}$)

(x) $Na_2S_2O_3$ (in the change : $S_2O_3^{2-} \rightarrow SO_4^{2-}$)

5. Equivalent weight of NH_3 in the change $N_2 \rightarrow NH_3$ is :

(A) $\frac{17}{6}$ (B) 17 (C) $\frac{17}{2}$ (D) $\frac{17}{3}$

6. In the reaction, $2S_2O_3^{2-} + I_2 \rightarrow S_4O_6^{2-} + 2I^-$, the eq. wt. of $Na_2S_2O_3$ is equal to its :

(A) Mol. wt. (B) Mol. wt./2 (C) 2 x Mol. wt. (D) Mol. wt./6

7. In the reaction, $VO + Fe_2O_3 \rightarrow FeO + V_2O_5$, the eq. wt. of V_2O_5 is equal to its :

(A) Mol. wt. (B) Mol. wt./8 (C) Mol .wt./6 (D) Mol. wt./2

8. The eq. wt. of iodine in, $I_2 + 2S_2O_3^{2-} \rightarrow 2I^- + S_4O_6^{2-}$ is :

(A) Its Mol. wt. (B) Mol. wt./2 (C) Mol. wt./4 (D) None of these

9. Molecular weight of $KBrO_3$ is M. What is its equivalent weight, if the reaction is :

$BrO_3^- \rightarrow Br^-$ (acidic medium)

(A) M (B) M/4 (C) M/6 (D) 6M

10. In the reaction : $A^{-n_2} + xe^- \rightarrow A^{-n_1}$, here x will be

(A) $n_1 + n_2$ (B) $n_2 - n_1$ (C) $n_1 - n_2$ (D) $n_1 . n_2$

11. The equivalent weight of $Na_2S_2O_3$ as reductant in the reaction,

$Na_2S_2O_3+H_2O+Cl_2 \rightarrow Na_2SO_4+2HCl+S$ is :

(A) (Mol. wt.)/1 (B) (Mol. wt.)/2 (C) (Mol. wt.)/6 (D) (Mol. wt.)/8

12. In a reaction 4 mole of electrons are transferred to one mole of HNO_3 when it acts as an oxidant. The possible reduction product is :

(A) (1/2) mole N_2 (B) (1/2) mole N_2O (C) 1 mole of NO_2 (D) 1 mole NH_3

13. The equivalent weight of $MnSO_4$ is half of its molecular weight when it is converted to :-

(A) Mn_2O_3 (B) MnO_2 (C) MnO_4^- (D) MnO_4^{-2}

14. $Cr_2O_7^{-2} + I^- + H^+ \rightarrow Cr^{+3} + I_2 + H_2O$

The equivalent weight of the reductant in the above equation is :– (At. wt. of Cr=52, I=127)

(A) 26 (B) 127 (C) 63.5 (D) 10.4