Redox Reactions

Q.No.1: Hydrogen peroxide oxidises $[Fe(CN)_6]^{4-}$ to $[Fe(CN)_6]^{3-}$ in acidic medium but reduces $[Fe(CN)_6]^{3-}$ to $[Fe(CN)_6]^{4-}$ in alkaline medium. The other products formed are, respectively : **JEE 2018**

A. H_2O and $(H_2O + O_2)$

B. H_2O and $(H_2O + OH^-)$

C. $(H_2O + O_2)$ and H_2O

D. $(H_2O + O_2)$ and $(H_2O + OH^-)$

Q.No.2: The oxidation states of Cr in $[Cr(H_2O)_6]\ Cl_3$, $[Cr(C_6H_6)_2]$, and $K_2[Cr(CN)_2(O)_2(O_2)\ (NH_3)]$, respectively are : **JEE 2018**

A. + 3, 0, and + 6

B. + 3, 0, and + 4

C. + 3, + 4, and + 6

D. + 3, + 2, and + 4

Q.No.3: 25 ml of the given HCl solution requires 30 mL of 0.1 M sodium carbonate solution. What is the volume of this HCl solution required to titrate 30 mL of 0.2 M aqueous NaOH solution? **JEE 2019**

A. 25 mL

B. 75 mL

C. 50 mL

D. 12.5 mL

Q.No.4: (A) $HOCl + H_2O_2 \rightarrow H_3O^+ + CI^- + O_2$

(B) $I_2 + H_2O_2 + 2OH^- \rightarrow 2I^- + 2H_2O + O_2$

Choose the correct option. **JEE 2021**

A. H_2O_2 acts as oxidising agent in equations (A) and (B).

B. H_2O_2 act as oxidizing and reducing agent respectively in equations (A) and (B).

C. H_2O_2 acts as reducing agent in equations (A) and (B).

D. H_2O_2 acts as reducing and oxidising agent respectively in equations (A) and (B).

Q.No.5: In mildly alkaline medium, thiosulphate ion is oxidized by MnO_4^- to "A". The oxidation state of sulphur in "A" is _____. **JEE 2021**

Q.No.6: 15 mL of aqueous solution of Fe^{2+} in acidic medium completely reacted with 20 mL of 0.03 M aqueous $Cr_2O_7^{2-}$. The molarity of the Fe^{2+} solution is _____ $\times 10^{-2}$ M. (Round off to the Nearest Integer). **JEE 2021**

Q.No.7: The reaction of sulphur in alkaline medium is given below:

$$S_{8(s)} + aOH^-_{(aq)} \rightarrow bS^{2-}_{(aq)} + cS_2O^{2-}_{3\,(aq)} + dH_2O_{(l)}$$

The value of 'a' is _____. **JEE 2021**

Q.No.8: The species given below that does NOT show disproportionation reaction is **JEE 2021**

A. BrO_3^-

B. BrO^-

C. BrO_2^-

D. BrO_4^-

Q.No.9: Identify the process in which change in the oxidation state is five :

JEE 2021

A. $C_2O_4^{2-} \rightarrow 2\,CO_2$

B. $Mn\,O_4^- \rightarrow Mn^{2+}$

C. $Cr_2\,O_7^{2-} \rightarrow 2\,Cr^{3+}$

D. $Cr\,O_4^{2-} \rightarrow Cr^{3+}$

Q.No.10: 10.0 mL of 0.05 M $KMnO_4$ solution was consumed in a titration with 10.0 mL of given oxalic acid dihydrate solution. The strength of given oxalic acid solution is _____ $\times 10^{-2}$ g/L.
(Round off to the Nearest Integer).

JEE 2021