Date Planned : __ / __ / __	Daily Tutorial Sheet-1	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	JEE Advanced (Archive)	Exact Duration :_____

1. $27\,g$ of Al will react completely with how many grams of oxygen ? **(1978)**

(A) $8\,g$ **(B)** $16\,g$ **(C)** $32\,g$ **(D)** $24\,g$

2. When the same amount of zinc is treated separately with excess of sulphuric acid and excess of sodium hydroxide, the ratio of volume of hydrogen evolved is : **(1978)**

(A) $1:1$ **(B)** $1:2$ **(C)** $2:1$ **(D)** $9:4$

3. 5.5 g of a mixture of $FeSO_4.7H_2O$ and $Fe_2(SO_4)_3 . 9H_2O$ requires 5.4 mL of 0.1 N $KMnO_4$ solution for complete oxidation. Calculate the number of gram mole of hydrated ferric sulphate in the mixture. $(\blacktriangleright)$ **(1979)**

4. M is molecule weight of $KMnO_4$. The equivalent weight of $KMnO_4$ when it is converted into K_2MnO_4 is :

(A) M **(B)** $M/3$ **(C)** $M/5$ **(D)** $M/7$ **(1980)**

5. A 1.00 g sample of H_2O_2 solution containing X per cent H_2O_2 by weight requires X mL of a $KMnO_4$ solution for complete oxidation under acidic conditions. Calculate the normality of the $KMnO_4$ solution. $(\blacktriangleright)$ **(1981)**

6. One mole of N_2H_4 loses ten moles of electrons of form a new compound Y. Assuming that all the nitrogen appears in the new compound, what is the oxidation state of nitrogen in Y ? (There is no change in the oxidation state of hydrogen.) $(\blacktriangleright)$ **(1981)**

(A) -1 **(B)** -3 **(C)** $+3$ **(D)** $+5$

7. Hydroxylamine reduce iron (III) according to the equation : **(1982)**

$2NH_2OH + 4Fe^{3+} \rightarrow N_2O(g)\uparrow + H_2O + 4Fe^{2+} + 4H^+$ $(\blacktriangleright)$

Iron (II) thus produced is estimated by titration with a standard permanganate solution. The reaction is

$MnO_4^- + 5Fe^{2+} + 8H^+ \rightarrow Mn^{2+} + 5Fe^{3+} + 4H_2O$

A 10 mL sample of hydroxylamine solution was diluted to 1 litre. 50 mL of this diluted solution was boiled with an excess of iron (III) solution. The resulting solution required 12 mL of 0.02 M $KMnO_4$ solution for complete oxidation of iron (II). Calculate the weight of hydroxylamine in one litre of the original solution.

8. The oxidation number of carbon in CH_2O is : **(1983)**

(A) -2 **(B)** $+2$ **(C)** 0 **(D)** $+4$

9. The equivalent weight of $MnSO_4$ is half of its molecular weight when it is converted to : **(1983)**

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

10. 2.68×10^{-3} moles of solution containing an ion A^{n+} require 1.61×10^{-3} moles of MnO_4^- for the oxidation of A^{n+} to AO_3^- in acidic medium. What is the value of n ? $(\blacktriangleright)$ **(1984)**

11. The brown ring complex compound is formulated as $[Fe(H_2O)_5(NO)]SO_4$. The oxidation state of iron is :

(A) 1 (B) 2 (C) 3 (D) 0 **(1987)**

12. **(i)** What is the weight of sodium bromate and molarity of solution necessary to prepare 85.5 mL of 0.672 N solution when the half-cell reaction is : **(1987)**

$$BrO_3^- + 6H^+ + 6e^- \longrightarrow Br^- + 3H_2O$$

(ii) What would be the weight as well as molarity if the half-cell reaction is :

$$2BrO_3^- + 12H^+ + 10e^- \longrightarrow Br_2 + 6H_2O$$

13. A sample of hydrazine sulphate $(N_2H_6SO_4)$ was dissolved in 100 mL of water, 10 mL of this solution was reacted with excess of ferric chloride solution and warmed to complete the reaction. Ferrous formed was estimated and it required 20 mL of M/50 potassium permanganate solution. Estimate the amount of hydrazine sulphate in one litre of the solution. **(1988)**

14. The oxidation states of the most electronegative element in the products of the reaction, BaO_2 with dil. H_2SO_4 is : **(1988)**

(A) 0 and -1 (B) -1 and -2

(C) -2 and 0 (D) -2 and -1

15. An equal volume of a reducing agent is titrated separately with 1 M $KMnO_4$ in acid, neutral and alkaline media. The volumes of $KMnO_4$ required are 20 mL in acid, 33.4 mL in neutral and 100 mL in alkaline media. Find out the oxidation state of manganese in each reduction product. Give the balanced equations for all the three half reaction. Find out the volume of 1 M $K_2Cr_2O_7$ consumed, if the same volume of the reducing agent is titrated in acid medium. ▶ **(1989)**