Daily Tutorial Sheet-4	Level-1

46.(D) Oxidant is IO_3^- : $3IO_3^- + 16H^+ + 16e^- \longrightarrow I_3^{-1} + 8H_2O \Rightarrow$ n factor is : $\frac{16}{3}$

In (A) : n factor = 1 ; (B) n factor = 1 ; (C) n factor = 3

47.(A) $O_2^0 \longrightarrow \overset{-2}{N}O \Rightarrow$ n factor = 4

$\Rightarrow$ gmeq of O_2 in 1.0 moles of $O_2 = 4 \times 1 = 4$

Since gmeq of O_2 = gmeq of $NH_3 = 4$

48.(D) $P^{-3} \xrightarrow[n=8]{} H_3\overset{+5}{P}O_4 \Rightarrow$ 1 mol $H_3PO_4 \equiv 8$mol e^-

49.(B) $NaHC_2O_4 \longrightarrow n = 2$ (as a reducing agent)

So, $0.1 \times 2 = 0.2$ N $NaHC_2O_4$ as a RA.

50.(A) Fluorine more reactive than MnO_2 , and is a very strong oxidizing agent.

51.(C) Let M be the molarity of $NaHC_2O_4 \xrightarrow{n=1}$ as an acid

$\xrightarrow[n=2]{}$ as a reducing agent.

With $KMnO_4$: $100 \times M \times 2 = 50 \times 0.1 \times 5 \Rightarrow M = \frac{1}{8}$

With NaOH : $\frac{1}{8} \times 1 \times 100 = 0.1 \times 1 \times V_{mL} \Rightarrow V_{mL} = 125$ mL

52.(B) meq of H_2O_2 = meq of MnO_4^- [n factor of $H_2O_2 = 2$; n factor of $MnO_4^- = n$)

$\Rightarrow$ $2 \times 0.1 \times 24 = n \times 0.1 \times 16 \Rightarrow n = 3$

$\therefore$ $\overset{+7}{Mn}O_4^- \xrightarrow{n=3} \overset{+4}{Mn}O_2$ (We can observe that medium must have been dilute alkaline).

53.(D) Learn as a fact.

54.(B) $H\overset{+4}{N}O_2 \longrightarrow \overset{+2}{N}O$ (As an OA)

55.(D) $MnO_4^- \xrightarrow{H^+} Mn^{2+}$ (n = 5)

56.(C) Find n factor using standard result : $\frac{1}{n} = \frac{1}{n_1} + \frac{1}{n_2} = \frac{1}{2} + \frac{1}{10} = \frac{6}{10} = \frac{3}{5} \Rightarrow n = \frac{5}{3}$

Hence equivalent weight $= \frac{M}{5/3} = \frac{3M}{5}$

Alternatively, equivalent weight can also be calculated as follows.

$$[Br_2 + 2e^- \longrightarrow 2Br^-] \times 5$$
$$\underline{Br_2 + 12OH^- \longrightarrow 2BrO_3^- + 6H_2O + 10e^-}$$
$$6Br_2 + 12OH^- \longrightarrow 2BrO_3^- + 10Br^- + 6H_2O$$

Observe that 10 mol of electron are involve per 6 moles of Br_2. $\Rightarrow$ n factor = $\frac{10}{6} = \frac{5}{3}$

57.(B) g meq of KHC_2O_4 = gmeq of $KMnO_4$

$2 \times x = 5 \times 0.02 \times \frac{100}{1000} \Rightarrow x = 0.005$ mol. [n factor of KHC_2O_4 as RA = 2 ; of $KMnO_4 = 5$]

58.(D) $\underbrace{Cr_2O_7^{2-} + 6e^- \rightarrow 2Cr^{3+}}_{\text{Reduction}} \Rightarrow$ $6e^-$ are required for 1 mol of $Cr_2O_7^{2-}$

59.(A) $Cr_2O_7^{2-} + 14H^+ + 6e^- \rightarrow 2Cr^{3+} + 7H_2O$

$(Sn^{2+} \rightarrow Sn^{4+} + 2e^-) \times 3$

$Cr_2O_7^{2-} + 14H^+ + 3Sn^{2+} \rightarrow 3Sn^{4+} + 2Cr^{3+} + 7H_2O$

$\Rightarrow$ 1 mol $Cr_2O_7^{2-} \equiv 3$mol of Sn^{2+}

It is clear from this equation that 3 moles of Sn^{2+} reduce one mole of $Cr_2O_7^{2-}$, hence 1 mol. of Sn^{2+} will reduce $\frac{1}{3}$ moles of $Cr_2O_7^{2-}$.

60.(D) $H_2\overset{-2}{S} \rightarrow \overset{0}{S} + 2e^-$

Equivalent wt. = $\frac{\text{Mol. wt.}}{2} = \frac{34}{2} = 17$.