31.(B) Temporary hardness of water is due to carbonates and bicarbonates of Ca, Mg.

32.(A) The maximum concentration of Mn should not exceed 0.05 ppm
(Refer NCERT Part-II, Class XI, page 408)

33.(B) On combustion, the energy released per gram of liquid H_2 and LPG are 142 kJ and 50 kJ respectively.

34.(A) Total isotopes of Hydrogen are three.

$^{1}_{1}H$ Protium

$^{2}_{1}H$ Deuterium

$^{3}_{1}H$ Tritium

Out of these three, Tritium is radio active.

35.(D) $H_2 + I_2 \overset{Pt}{\rightleftharpoons} 2HI$ is a kinetically slow reaction due to less oxidizing nature of I_2. Hence ; Pt catalyst is used.

36.(C) SiH_4 has complete octet.

37.(A) Molarity of $CaSO_4$ = 10^{-3}M

$\Rightarrow$ 10^{-3} mol of $CaSO_4$ in 1L solution

Number of gram equivalents of $CaSO_4$ = number of gram equivalents of $CaCO_3$

$\Rightarrow$ $n_{CaSO_4} \times$ n-factor = $n_{CaCO_3} \times$ n-factor

$\Rightarrow$ $10^{-3} \times 2 = n_{CaCO_3} \times 2$ $\Rightarrow$ $n_{CaCO_3} = 10^{-3}$ mole in 1L

$\therefore$ Mass of $CaCO_3$ = $10^{-3} \times 100 = \frac{1}{10}$ gm in 1L $\Rightarrow$ $\left(\frac{1}{10} \times 10^3\right)$ milligram in 1L

$\Rightarrow$ 100 milligram in 1L $\Rightarrow$ 100 ppm

38.(C) Na^+H^- is an ionic or saline hydride.

39.(B) $Be(OH)_2$ is amphoteric among alkaline earth metal hydroxides.

40.(A) K, Rb and Cs form superoxides on reaction with excess of air.

$Rb + \underset{(excess)}{O_2} \longrightarrow RbO_2$

$2RbO_2 + 2H_2O \longrightarrow 2RbOH + H_2O_2 + O_2$

41.(B) Fact

42.(A) Be is used in making X-ray tube window.

43.(A)

$Na_2CO_3 \cdot 10H_2O$	—	Solvay process
$Mg(HCO_3)$	—	Temporary Hardness
NaOH	—	Castner-Kellner process
$Ca_3Al_2O_6$	—	Portland cement ingredient

44.(D) H_2O_2 act as oxidising agent and reducing agent in acidic medium as well as basic medium.

45.(C) The tendency of alkaline earth metal salts to form hydrates decreases down the group.