

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

- When KMnO_4 acts as an oxidant and ultimately forms $[\text{MnO}_4]^{2-}$, MnO_2 , Mn_2O_3 and Mn^{2+} , then number of electrons transferred in each case respectively is: (2002)
(A) 4, 3, 1, 5 **(B)** 1, 5, 3, 7 **(C)** 1, 3, 4, 5 **(D)** 3, 5, 7, 1
- Which of the following is a redox reactions: (2002)
(A) $\text{NaCl} + \text{KNO}_3 \longrightarrow \text{NaNO}_3 + \text{KCl}$
(B) $\text{CaC}_2\text{O}_4 + 2\text{HCl} \longrightarrow \text{CaCl}_2 + \text{H}_2\text{C}_2\text{O}_4$
(C) $\text{Mg}(\text{OH})_2 + 2\text{NH}_4\text{Cl} \longrightarrow \text{MgCl}_2 + 2\text{NH}_4\text{OH}$
(D) $\text{Zn} + 2\text{AgCN} \longrightarrow 2\text{Ag} + \text{Zn}(\text{CN})_2$
- Which reaction is possible at anode? (2002)
(A) $2\text{Cr}^{3+} + 7\text{H}_2\text{O} \longrightarrow \text{Cr}_2\text{O}_7^{2-} + 14\text{H}^+$ **(B)** $\text{F}_2 \longrightarrow 2\text{F}^-$
(C) $\text{O}_2 + 4\text{H}^+ \longrightarrow 2\text{H}_2\text{O}$ **(D)** None of these
- The oxidation number of Cl in CaOCl_2 (bleaching powder) is: (2002)
(A) zero, since it contains Cl_2 **(B)** -1, since it contains Cl^-
(C) +1, since it contains ClO^- **(D)** +1 and -1, since it contains ClO^- and Cl^-
- The oxidation state of nickel in $\text{K}_4[\text{Ni}(\text{CN})_4]$ is: (2002)
(A) +1 **(B)** +2 **(C)** -1 **(D)** 0
- What volume of hydrogen gas at 273K and 1atm pressure will be consumed in obtaining 21.6g of elemental boron (atomic mass = 10.8) from the reduction of boron trichloride with hydrogen : (2003)
(A) 44.8L **(B)** 22.4L **(C)** 89.6L **(D)** 67.2L
- The oxidation state of Cr in $[\text{Cr}(\text{NH}_3)_4\text{Cl}_2]^+$ is: (2005)
(A) +3 **(B)** +2 **(C)** +1 **(D)** 0
- The oxidation state of chromium in the final product formed by the reaction between KI and acidified potassium dichromate solution is: (2005)
(A) +3 **(B)** +2 **(C)** +6 **(D)** +4
- Which of the following chemical reaction depicts the oxidizing behavior of H_2SO_4 ? (2006)
(A) $2\text{PCl}_5 + \text{H}_2\text{SO}_4 \longrightarrow 2\text{POCl}_3 + 2\text{HCl} + \text{SO}_2\text{Cl}_2$
(B) $2\text{HI} + \text{H}_2\text{SO}_4 \longrightarrow \text{I}_2 + \text{SO}_2 + 2\text{H}_2$
(C) $\text{Ca}(\text{OH})_2 + \text{H}_2\text{SO}_4 \longrightarrow \text{CaSO}_4 + 2\text{H}_2\text{O}$
(D) $\text{NaCl} + \text{H}_2\text{SO}_4 \longrightarrow \text{NaHSO}_4 + \text{HCl}$

10. In the reaction : $2\text{Al(s)} + 6\text{HCl(aq)} \rightarrow 2\text{Al}^{3+}(\text{aq}) + 6\text{Cl}^{-}(\text{aq}) + 3\text{H}_2(\text{g})$ (2007)
- (A) 6 liter HCl(aq) is consumed for every $3\text{LH}_2(\text{g})$ produced
- (B) 33.6 liter $\text{H}_2(\text{g})$ is produced regardless of temperature and pressure for every mole of Al that reacts
- (C) 67.2 liter $\text{H}_2(\text{g})$ at STP is produced for every mole of Al that reacts
- (D) 11.2 liter $\text{H}_2(\text{g})$ at STP is produced for every mole of HCl(aq) consumed
11. Amount of oxalic acid present in a solution can be determined by its titration with KMnO_4 solution in the presence of H_2SO_4 . The titration gives unsatisfactory result when carried out in the presence of HCl because HCl (2008)
- (A) Gets oxidized by oxalic acid to chlorine
- (B) Furnishes H^{+} ions in addition to those from oxalic acid
- (C) Reduces permanganate to Mn^{2+}
- (D) Oxidizes oxalic acid to carbon dioxide and water
12. Amount of oxalic acid present in a solution can be determined by its titration with KMnO_4 solution in the presence of H_2SO_4 . The titration gives unsatisfactory result when carried out in the presence of HCl , because HCl : (2008)
- (A) gets oxidized by oxalic acid to chlorine
- (B) furnishes H^{+} ions in addition to those from oxalic acid
- (C) reduces permanganate to Mn^{2+}
- (D) oxidizes oxalic acid to carbon dioxide and water
13. The mass of potassium dichromate crystals required to oxidize 750cm^3 of 0.6M Mohr's salt solution is (molar mass = 392): (2011)
- (A) 0.49 g (B) 0.45 g (C) 22.05 g (D) 2.2 g
14. A gaseous hydrocarbon gives upon combustion, 0.72g of water and 3.08g of CO_2 . The empirical formula of the hydrocarbon is : (2013)
- (A) C_2H_4 (B) C_3H_4 (C) C_6H_6 (D) C_7H_8
15. Consider the following reaction, $x\text{MnO}_4^{-} + y\text{C}_2\text{O}_4^{2-} + z\text{H}^{+} \longrightarrow x\text{Mn}^{2+} + 2y\text{CO}_2 + \frac{z}{2}\text{H}_2\text{O}$ (2013)
- The value of x, y and z in the reaction are, respectively:
- (A) 5, 2 and 16 (B) 2, 5 and 8 (C) 2, 5 and 16 (D) 5, 2 and 8
16. The volume strength of 1M H_2O_2 is : (Molar mass of $\text{H}_2\text{O}_2 = 34\text{g mol}^{-1}$) (2019)
- (A) 16.8 (B) 11.35 (C) 22.4 (D) 5.6
17. In the reaction of oxalate with permanganate in acidic medium, the number of electrons involved in producing one molecule of CO_2 is : (2019)
- (A) 10 (B) 1 (C) 5 (D) 2

- 18.** The redox reaction among the following is: **(2020)**
- (A) reaction of H_2SO_4 with NaOH
- (B) formation of ozone from atmospheric oxygen in the presence of sunlight
- (C) combination of dinitrogen with dioxygen at 2000 K
- (D) reaction of $[\text{Co}(\text{H}_2\text{O})_6]\text{Cl}_3$ with AgNO_3
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- 19.** NaClO_3 is used, even in spacecrafts, to produce O_2 . The daily consumption of pure O_2 by a person is 492L at 1 atm, 300 K. How much amount of NaClO_3 , in grams, is required to produce O_2 for the daily consumption of a person at 1 atm, 300 K? **(2020)**
- $\text{NaClO}_3(\text{s}) + \text{Fe}(\text{s}) \longrightarrow \text{O}_2(\text{g}) + \text{NaCl}(\text{s}) + \text{FeO}(\text{s})$ $R = 0.082 \text{ L atm mol}^{-1} \text{ K}^{-1}$
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- 20.** The compound that cannot act both as oxidising and reducing agent is: **(2020)**
- (A) HNO_2 (B) H_2O_2 (C) H_3PO_4 (D) H_2SO_3
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- 21.** Oxidation number of potassium in K_2O , K_2O_2 and KO_2 , respectively, is: **(2020)**
- (A) +1, +4 and +2 (B) +2, +1 and $+\frac{1}{2}$ (C) +1, +2 and +4 (D) +1, +1 and +1