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**Max Time : 1 hr** **Class = 12th Chemistry Test**  **Max Marks : 25**

**ELECTROCHEMISTRY**

**(Based on Gibbs Free Energy , Cell & Battery)**

1. Write the chemical formula of rust. [ 1 ]
2. What is cathodic protection? [ 1 ]
3. What is primary cell? Give an example. [ 1 ]
4. Why does a dry cell become dead after a long time even if it has not been used? [ 1 ]
5. How many molecules of chlorine should be deposited from molten sodium chloride in one minute by a current of 300 milliampere? [ 2 ]
6. Write the name of the cell which is generally used in hearing aids. Write the reactions taking place at the anode and the cathode of this cell. [ 2 ]
7. Calculate the cell emf at 25˚C for the cell : Mg (s) | Mg2+ (0.01 M) || Sn2+ (0.1 M) | Sn (s). [ 2 ]

= 2.34 volt , = 0.136 volt

Calculate the maximum work that can be accomplished by the operation of this cell.

1. Write electrode reactions taking place in : (i) Ni-Cd cell (ii) Lead acid accumulator. [ 3 ]
2. Estimate the minimum potential difference needed to reduce Al2O3 at 500. The free energy change for the decomposition reaction. Al2O3 Al + O2  is 960 kJ. [ 3 ]
3. Calculate Go and Log Kc for the following reaction at 298K : [ 3 ]

2 Cr (s) + 3 Fe2+ 2 Cr3+ (aq) + 3 Fe (s) ; Given that : = 0.30 V

1. For the cell, Mg (s) | Mg2+ (aq) || Ag+ (aq) | Ag (s), calculate the equilibrium constant of the cell reaction at 25˚C and maximum work that can be obtained by operating the cell. [ 3 ]

= 2.37 volt , = 0.80 volt

1. (i) A current of 1.5 A was passed through an electrolytic cell containing AgNO3 solution with inert

electrodes. The weight of Ag deposited was 1.5 g. How long did the current flow? [ 3 ]

(ii) Write the reactions taking place at the anode and the cathode in the above cell.

(iii) Give reactions taking place at the two electrodes if these are made up of Ag.