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

**ELECTROCHEMISTRY**

1. Which one of following is always true about the spontaneous cell reaction in a galvanic cell? [ 1 ]

|  |  |
| --- | --- |
| a) > 0 , Go < 0 , Q > Kc | b) < 0 , Go < 0 , Q < Kc |
| c) > 0 , Go > 0 , Q > Kc | d) > 0 , Go < 0 , Q < Kc |

1. Write Nernst equation for the reaction : 2 Cr + 3 Fe2+ 2 Cr3+ + 3 Fe [ 1 ]
2. How can the reduction potential of an electrode be increased ? [ 1 ]
3. What is Primary cell? Give an example. [ 1 ]
4. What is the role of ZnCl2 in a dry cell? [ 1 ]
5. Write the name of the electrode used in (i) Fuel cell (ii) Mercury cell [ 1 ]
6. What is cathodic protection? [ 1 ]
7. Two half cells are : Al3+ (aq)/Al and Mg2+ (aq)/Mg. The reduction potentials of these half cells are 1.66 V and 2.36 V respectively. Calculate the cell potential. Write the cell reaction also. [ 3 ]
8. Predict reaction of 1 N sulphuric acid with : (i) Copper (ii) Lead (iii) iron. [ 3 ]

= 0.34 volt , = 0.13 volt , = 0.44 volt

1. Calculate the standard electrode potential of the Ni2+/Ni electrode if the cell potential of the cell

Ni | Ni2+ (0.01 M) || Cu2+ (0.1 M) | Cu is 0.59 V. Given : = 0.34 volt [ 3 ]

1. Calculate the potential of a zinc – zinc ion electrode in which the zinc ion activity is 0.001 M. [ 3 ]

= 0.76 V , R = 8.314 J K – 1 mol– 1 , F = 96500 C/mol

1. Calculate the equilibrium constant for the reaction at 298 K [ 3 ]

4 Br –  + O2 + 4 H+ 2 Br2 + 2 H2O Given that : = 0.16 V

1. Calculate the cell emf at 25˚C for the cell : Mg (s) | Mg2+ (0.01 M) || Sn2+ (0.1 M) | Sn (s). [ 3 ]

= 2.34 volt , = 0.136 volt

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