

Model Question Paper
Electro Chemistry II - Part I

12th Standard

Chemistry

Reg.No. :

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I. Answer all the questions.

II. Use blue pen only.

Time : 01:30:00 Hrs

Total Marks : 75

5 x 1 = 5

Part-A

- 1) The potential of a single electrode is a half cell is called the
(a) Reduction potential (b) Half-wave potential (c) Single electrode potential (d) cell potential
- 2) The relationship between free energy change and e.m.f of a cell is
(a) $\Delta G = -nFE$ (b) $\Delta H = -nFE$ (c) $\Delta E = -nFG$ (d) $\Delta F = -nEG$
- 3) The feasibility of a redox reaction can be predicted with the help of
(a) Electronegativity (b) Electrochemical series (c) Electron affinity (d) Equivalent conductance
- 4) The metals near the bottom of the electrochemical series are
(a) strong reducing agents (b) strong oxidising agents (c) weak reducing agents (d) weak oxidising agents
- 5) The emf of a cell with 1 M solutions of reactants and products in solution at 25°C is called
(a) Half cell potential (b) standard emf (c) Single electrode potential (d) Redox potential

Part-B

5 x 3 = 15

- 6) The standard reduction potentials of Fe^{3+}/Fe and Fe^{2+}/Fe . electrode systems are -0.035 V and -0.44V respectively .Predict which of the two oxidations is easy:
 Fe^{3+}/Fe and Fe^{2+}/Fe
- 7) What are the types of changes in the cathode and anode in electrolytic and electrochemical cells?
- 8) Write the electrochemical cell for the overall cell reaction $\text{Zn}_{(s)} + 2\text{AgNO}_3 \longrightarrow 2\text{Ag}_{(s)} + \text{Zn}(\text{NO}_3)_2$
- 9) The standard reduction potential of $\text{Fe}^{3+}, \text{Fe}^{2+}/\text{pt}$ is +0.771V. This half cell is connected with another half cell such that e.m.f. of the cell is 0.771V. What is the other half cell?
- 10) Write the cell reaction for the half cell $\text{Cl}^-_{(aq)} = / \text{AgCl}_{(s)} \text{Ag}$.

Part - C

6 x 5 = 30

- 11) Predict whether the reaction
 $2\text{Ag}_{(s)} + \text{Zn}^{2+}_{(aq)} \longrightarrow 2\text{Ag}^+_{(aq)} + \text{Zn}_{(s)}$
is feasible or not.
- 12) Determine the feasibility of the reaction
 $2\text{Al}_{(s)} + 3\text{Sn}^{4+}_{(aq)} \longrightarrow 2\text{Al}^{3+}_{(aq)} + 3\text{Sn}^{2+}_{(aq)}$
- 13) Calculate the standard e.m.f. of the cell : $\text{Cd}, \text{Cd}^{2+} \parallel \text{Cu}^{2+}, \text{Cu}$ and determine the cell reaction. The standard reduction potentials of $\text{Cu}^{2+}, \text{Cu}$ and $\text{Cd}^{2+}, \text{Cd}$ are 0.34V and -0.40 volts respectively. Predict the feasibility of the cell reaction.
- 14) Describe Daniel cell
- 15) Write an account on Cell terminology
- 16) Write the IUPAC convention of representation of a cell.

Part-D

2X10=20

- 17) a) Determine the standard emf of the cell and standard free energy change of the cell reaction.
 $\text{Zn}, \text{Zn}^{2+} \parallel \text{Ni}^{2+}, \text{Ni}$. The standard reduction potentials of $\text{Zn}^{2+}, \text{Zn}$ and $\text{Ni}^{2+}, \text{Ni}$ half cells are - 0.76 V and - 0.25 V respectively.
- b) What is the potential of a half-cell consisting of zinc electrode in 0.01 M ZnSO_4 solution 25°C . $E_0 = 0.763 \text{ V}$.
- 18) a) How is e.m.f of a half cell determined?
- b) Write note on Standard Hydrogen Electrode (SHE).
