

ELECTRO CHEMISTRY I AND II

Std. XII
CHEMISTRY

Time: 1½
Max.Marks: 75

PART - I

Choose and write the correct answer:

(15 × 1 = 15)

- The laws of electrolysis were enunciated first by
a Faraday b Avogadro c Kekule d Dalton
- Metallic Chromates are yellow due to the presence of
a Cr_2O_3 b CrO_4^{2-} c Cr d $\text{Cr}_2\text{O}_7^{2-}$
- The pH of a solution containing 0.1 N NaOH solution is
a 10^{-1} b 1 c 10^{-13} d 13
- The pH of 1M HCl is
a one b zero c two d three
- The solution with pH = 8 is
a weakly acidic b weakly basic
c neutral d strongly acidic
- The colour of Nickel salts are
a green b red c yellow d blue
- The unit of quantity of electricity is
a Volt b Coulomb c Ohm d Ampere
- The pH scale was introduced by
a Sorensen b Henderson c Debye d Huckel
- The ratio of equivalent mass to Faraday in coulomb unit is equal to
a coulomb b specific resistance
c electrochemical equivalent d specific conductance
- The equivalent conductance is equal to molar conductance in the case of
a Na_2SO_4 b MgSO_4 c NaCl d H_2SO_4
- The pH range of methyl red is
a 3.1 – 4.4 b 6.8 – 8.4 c 4.4 – 6.2 d 8.3 – 10
- Ohm is the unit of
a current b resistance
c potential difference d quantity of electricity
- When 10^{-6} M of a monobasic strong acid is dissolved in one litre of solvent, the pH of the solution is
a more than 7 b less than 6 c 6 d 7

14. Ostwald's dilution law is based on

- a Arrhenius theory
- b Lewis theory
- c Lowry Bronsted theory
- d Quinonoid theory

15. pH of 0.05 M H_2SO_4 is

- a 1
- b 2.6990
- c 1.3010
- d 1.6990

PART - II

Answer all the questions:

(10 × 3 = 30)

- 16. What is an electrolytic cell?
- 17. State Faraday's laws of electrolysis.
- 18. Define specific conductance.
- 19. Define Kohlraush's law and common ion effect
- 20. What is Ostwald's dilution law?
- 21. Define electro chemical equivalent
- 22. Distinguish between electrolytic conductor and metallic conductor
- 23. What is buffer action?
- 24. Calculate the pH of 0.1 M CH_3COOH solution. Dissociation constant of acetic acid is 1.8×10^{-5} M
- 25. pH of a solution is 5.5 at 25°C. Calculate its $[\text{OH}^-]$ concentration.

PART - III

Answer all the questions:

(4 × 5 = 20)

- 26. Write notes on IUPAC convention of representation of a cell
- 27. Derive Nernst equation and calculation of Half - cell potential
- 28. Calculate the emf of the cell $\text{Zn} \mid \text{Zn}^{2+} (0.001\text{M}) \parallel \text{Ag}^+ (0.1\text{M}) \mid \text{Ag}$ The standard potential of Ag^+/Ag half cell is + 0.80 V and Zn^{2+}/Zn is - 0.76 V
- 29. Write the postulates of Arrhenius theory

PART - IV

Answer all the questions:

(1 × 10 = 10)

- 30. (a) Derive Henderson - Hasselbalch equation
- (b) Explain the relationship between EMF and free energy.