



### SECTION-B

- Q2 Calculate mean activity coefficient for 0.01(M) solution of KCl in water at 25°C according to Debye-Huckel limiting law. Given,  $A = 0.51$  at 25°C.
- Q3 Derive Gibbs-Duhem equation for chemical potential related with the composition of the system.
- Q4 The molar conductances of  $\text{CH}_3\text{COONa}$ ,  $\text{HCl}$  and  $\text{NaCl}$  at infinite dilution are  $91 \times 10^{-4}$ ,  $426 \times 10^{-4}$  and  $126 \times 10^{-4} \text{ Sm}^2\text{mol}^{-1}$  respectively at 25°C. Calculate the molar conductance at infinite dilution for  $\text{CH}_3\text{COOH}$ .
- Q5 Write a short note on electrical double layer.
- Q6 Describe briefly important applications of polarography.
- Q7 Unimolecular reactions are not always first order kinetics. Justify the statement using Lindemann theory.
- Q8 How the stopped flow method is used for studying kinetics of fast reaction?
- Q9 Differentiate between primary isotope effect and secondary isotope effect.

### SECTION-C

- Q10 Deduce a relation between fugacity and pressure. Hence, proved that for an ideal gas fugacity is identical with pressure. What is dropping mercury electrode (DME)? Mention the advantages of DME.

**OR**

- Q10. Discuss the Debye-Huckel theory of mean ionic activity coefficient. Derive the Debye- Huckel limiting law equation. How can these equations are verified?
- Q11 Discuss in details the kinetics of chain reaction. How NMR method is used for study of the fast reactions?

**OR**

- Q11 Derive the rate equation. Explain the primary and secondary isotopic effects on reaction rate.

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