

Time allowed: 3 Hours

Max. Marks: 60

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting one question from each Unit.

x-x-x

- Q1. (a) What is the Standard Hydrogen Electrode? Why is it considered a primary reference electrode?
(b) What is the Cotton effect?
(c) Describe the liquid–liquid extraction technique.
(d) Write a note on TLC. (4×3)

UNIT - I

- Q2. (a) Explain the construction and working of the Glass Electrode used for pH measurement. Mention its advantages and applications.
(b) Explain the conductometric method and describe how the conductance of electrolyte solutions is measured using a conductivity cell. (6,6)
- Q3. (a) Explain the Ostwald Dilution Law and discuss its significance in conductometric studies.
(b) Describe the principle and working of Polarography. (6,6)

UNIT - II

- Q4. (a) Explain the principle, instrumentation, and applications of Refractometry.
(b) Explain the different types of interferences encountered in Atomic Absorption Spectroscopy. (6,6)
- Q5. (a) Discuss the radiation sources used in atomic absorption spectroscopy, particularly the Hollow Cathode Lamp and Electrodeless Discharge Lamp.
(b) With a neat diagram, explain the working of a flame photometer used in Flame Emission Spectroscopy. (6,6)

UNIT - III

- Q6. (a) Explain the principle, procedure, and applications of Solid Phase Extraction.
(b) What is the Raman effect? Discuss the requirements for observing the Raman Effect in molecules. (6,6)

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(2)

- Q7. (a) Discuss the Distribution Law and explain its importance in extraction processes.
(b) Explain the Raman scattering process and distinguish between Stokes and anti-Stokes lines. (6,6)

UNIT - IV

- Q8. (a) Explain the principle, instrumentation, and applications of Gas Chromatography.
(b) Discuss various components of instrumentation of HPLC. (6,6)
- Q9. (a) Describe the working and applications of the Electrolytic Hygrometer.
(b) Explain the working and importance of automatic analyzers used in industrial process control. (6,6)

x-x-x