

D4ACH2301

(2 Pages)

Name.....

Reg.No.....

FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2025
(Regular/Improvement/Supplementary)

CHEMISTRY
FCHE4C12 - INSTRUMENTAL METHODS OF ANALYSIS

Time: 3 Hours

Maximum Weightage: 30

Section A: Short answer questions. Answer any *eight* questions. Each carries *one* weightage.

1. Define accuracy and precision in chemical analysis with examples.
2. Explain the importance of significant figures in analytical data.
3. What are the differences between co-precipitation and post-precipitation?
4. Briefly describe the role of masking and de-masking agents in complexometric titrations.
5. Explain the working principle of a glass electrode in potentiometry.
6. Describe the importance of rapid scan and pulse techniques in polarography.
7. What are the key differences between photometry and spectrophotometry?
8. Write a short note on glue discharge.
9. Give the advantages of coulometric titrations.
10. Explain the importance of organic polarography.
11. Explain the role of thermogravimetry in chemical analysis.
12. Describe the principle and applications of neutron activation analysis.

(8 × 1 = 8 weightage)

Section B: Short essay questions. Answer any *four* questions. Each carries *three* weightage.

13. Discuss the methods for minimization of errors in chemical analysis.
14. Explain the theory of neutralization titrations with the help of titration curves for strong acids and weak bases.
15. Elaborate on the construction and working of gas sensing electrodes. Give their applications.
16. Compare the instrumentation of single-beam and double-beam spectrophotometers.
17. Describe the principle, instrumentation and applications of anodic stripping voltammetry.

(P.T.O.)

18. Explain the theory and applications of thin-layer chromatography and paper chromatography.
19. Discuss the principles and applications of Differential Scanning Calorimetry.

(4 × 3 = 12 weightage)

Section C: Essay questions. Answer any *two* questions. Each carries *five* weightage.

20. Write a detailed note on the statistical treatment of analytical data, including mean, standard deviation, variance and confidence limits.
21. Explain the principle, methods and instrumentation of atomic emission spectrometry with emphasis on inductively coupled plasma.
22. Describe the fundamental principles, instrumentation and major applications of High-Performance Liquid Chromatography.
23. Discuss the principle, instrumentation and major applications of TEM.

(2 × 5 = 10 weightage)