Roll.No. | 25PCHET1A01

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
M.Sc.Chemistry - END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - I
25PCHET1A01 - Analytical Techniques in Chemistry

Total Duration : 2 Hrs. 30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Explain how the t-test and F-test can be applied to compare precision and accuracy between two analytical methods.
2. Apply the Ilkovic equation to calculate the diffusion current in a polarographic analysis.
3. Describe how potentiometric titration can be used for the estimation of chloride ions.
4. Explain how neutron activation analysis helps in quantitative determination of trace elements.
5. Explain how chemical shift and fine structure in XPS can be used to analyze oxidation states.
6. Explain the interpret photoelectron spectra of simple molecules on the basis of Koopman's theorem
7. Analyze the concept of retention factor (Rf) to identify compounds in TLC analysis.
8. Apply the concept of partition coefficient to explain separation in paper chromatography.

Section C

I - Answer any **TWO** questions $(2 \times 10 = 20$ Marks)

9. Analyze various types of errors in chemical analysis and suggest methods to minimize them.
10. Assess the advantages and limitations of cyclic voltammetry as a tool for studying redox behavior of complexes.
11. Evaluate the factors affecting TGA and DTA curves and their use in compound identification.

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12. Examine how atomic absorption spectroscopy differs from emission spectroscopy in instrumentation and analytical capability.

II - Compulsory question $(1 \times 10 = 10$ Marks)

13. Analyze the differences between GC, HPLC, and UPLC in terms of resolution, efficiency, and instrumentation.

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