

D 143130

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Name.....

Reg. No.....

**FOURTH SEMESTER M.Sc. DEGREE REGULAR / SUPPLEMENTARY
EXAMINATION, APRIL 2026**

(CBCSS)

Chemistry

CHE 4C 12—INSTRUMENTAL METHODS OF ANALYSIS

(2019 Admission Onwards)

Time : Three Hours

Maximum : 30 Weightage

Part A

*Answer any **eight** questions.
Each question carries a weightage of 1.*

1. Distinguish between accuracy and precision.
2. A sparingly soluble salt has a solubility of 5×10^{-5} moles per liter. Find the solubility product.
3. 100 ml 0.01N HCl is titrated against 0.01N Na OH. Suggest a suitable indicator. Justify your answer.
4. In planography high concentration of a supporting electrolyte like KCl is added. Why ?
5. Planographic experiments are conducted using three electrodes. Why ?
6. Explain coulometric titration.
7. Name the detecting system in IR spectroscopy.
8. How would you distinguish between XPS and AES peaks in photoelectron spectroscopy ?
9. What is thermometric titration ?
10. Write Van Deemter equation. Explain.

(8 × 1 = 8 weightage)

Part B

*Answer any **six** questions.
Each question carries a weightage of 2.*

11. Replicate analysis to find % of Ag in a sample is given : 95.67, 95.61, 95.71, 95.60. Calculate the standard deviation.
12. Briefly explain titrations in nonaqueous media.

Turn over

13. A dilute solution of CuSO_4 is electrolysed between two pt electrodes by passing a current of 0.8A for 15.2 minutes. Predict the products at anode and cathode and also estimate the products.
14. Briefly explain amperometric titration.
15. In *uv*-visible spectrophotometry a 10^{-5} M solution showed an absorbance of 2.0 at a path length of 1.0 cm. What percentage of the radiation is absorbed by the sample ? What is the molar absorptivity ?
16. Briefly discuss the principle AFM.
17. 1.00 mg of tryptophan labelled with ^{14}C gave 584 cpm w.r.t. the background. The labelled compound was mixed with the sample and tryptophan was isolated. 18.0 mg of this sample of tryptophan gave 204 cpm. Calculate the amount of tryptophan in the sample.
18. Briefly discuss the principle and applications of Gel permeation chromatography.

(6 × 2 = 12 weightage)

Part C

*Answer any two questions.
Each question carries a weightage of 5.*

19. Write a brief account of the theory and applications of planography.
20. Briefly discuss instrumentation in AAS.
21. Discuss theory and applications of neutron activation analysis.
22. Write a brief account of detectors employed in GC.

(2 × 5 = 10 weightage)