20. (a) Draw a polargram and explain its essential features.

Or

(b) Discuss the applications of amperometric titrations.

SECTION C — (3 × 10 = 30)

Answer any THREE questions.

21. (a) Draw a schematic diagram of IR spectroscopy and discuss about various components.

(b) Explain about bathochromic and hypsochromic shifts.

22. (a) Explain accuracy and precision.

(b) What is analysis of variance? Give its applications.

23. Discuss the principle and technique of Thin Layer Chromatography.

24. (a) Describe the DTA curve of $Ca(CH_3COO)_2 \cdot H_2O$ in air.

(b) Discuss about the thermometric titration of HCl Vs NaOH.

25. (a) Write note on applications of polarography.

(b) Discuss about various titration curves involving in amperometric titrations.

(For candidates admitted from 2022–2023 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2023.

Chemistry — Elective

ANALYTICAL CHEMISTRY

Time : Three hours Maximum : 75 marks

SECTION A — (20 marks)

Answer ALL questions.

I (A) Multiple Choice Questions : (5 × 1 = 5)

1. The main parameter that we measure in X-ray absorption spectra is
   (a) Mass (b) Concentration
   (c) Frequency (d) Bond order
2. Variance is denoted by the following simble
   (a) σ (b) σ^2
   (c) ε (d) δ
3. In partition paper chromatography the stationary phase is
   (a) Ether (b) Alcohol
   (c) Water (d) Benzene
4. In which technique change of temperature is measured as the function of volume?
   (a) TGA
   (b) DTA
   (c) Thermometric titration
   (d) Derivative TGA

5. Supporting electrolyte is used to supplies
   (a) Diffusion current
   (b) Migration current
   (c) Residual current
   (d) Limiting current

(B) Fill in the blanks : (5 × 1 = 5)

6. The sample holder in the IR spectra is made up of _____.

7. _____ errors can be rectified under suitable conditions.

8. Gas Chromatogram is the plot of voltage on detector as the function of _____.

9. Synchronous fluorescence spectrum is scanning the excitation wavelength and _____ wavelength simultaneously.

10. An electrical signal produced in electrochemical sensors proportional to _____.

II. Answer ALL the questions : (5 × 2 = 10)

11. What is the principle of EXAFS?

12. Define : Standard Deviation.

13. Write a note on eluation in Colum Chromatography.

14. What is meant by static thermal analysis?

15. How is migration current produced in Polarography?

SECTION B — (5 × 5 = 25)

Answer ALL questions, choosing either (a) or (b).

16. (a) Describe the principle of turbidimetry and give its application.

Or

(b) Discuss about sample handling techniques involve in IR Spectroscopy.

17. (a) What are the difference between repeatability and reproducibility?

Or

(b) What is curve fitting give its significants?

18. (a) Discuss the extraction of solvent by Soxhlet Extractor.

Or

(b) Discuss about the advantages of HPLC.

19. (a) What is thermogravimetry analysis? What informations would you get from the thermogram?

Or

(b) Give the applications of flow cytometry.