D4ACH2001 **(1 Page)** **Name.....**
Reg. No.....

FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2022
(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. Explain absolute and relative errors.
2. What is the difference between mean and standard deviation of a measurement?
3. Differentiate T-test and F-test.
4. Describe the principles of cerimetric titration.
5. What are redox indicators? Explain with suitable example.
6. Elaborate on post precipitation.
7. Explain primary and secondary coulometry.
8. Illustrate the application of oxine as a precipitating agent in gravimetric analysis.
9. Give a short account on the principle of Auger Spectroscopy.
10. Describe the principle of isotope dilution method.
11. Explain the selection of the stationary liquid phase in GLC.
12. What is ion – exchange chromatography?

(8×1 = 8 weightage)

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

13. Measurement of melting point of a substance yielded the following data: 78, 82, 81, 77, 72, 79, 82, 81, 78, and 83. Determine whether 72 is an outlier within 95% and 99% confidence limits. Also calculate the standard deviation of the measurements. The critical rejection values for 10 measurements are 0.466 and 0.568 for 95% and 99% confidence limits respectively.
14. Describe precipitation titration.
15. Write a note on amperometry.
16. Illustrate the principles of Anodic Stripping Voltammetry.
17. Explain nephelometry and turbidometry.
18. Discuss the limitations and applications of glass electrode.
19. Explain Gel Permeation Chromatography.

(4×3 = 12 weightage)

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

20. Explain the principle and application of Polarographic technique for concentration determination.
21. Discuss the principle, instrumentation and applications of Atomic Force Microscopy.
22. Illustrate and explain the instrumentation of Differential Thermal Analysis and Differential Scanning Calorimetry. What are the differences between them?
23. Give a detailed account on the principle, instrumentation and analytical applications of Atomic Emission Spectrometry.

(2×5 = 10 weightage)