61904

Reg. No.

I Semester M.Sc. Degree Examination, March/April - 2025

CHEMISTRY

Analytical Chemistry

(CBCS Scheme 2019-20 Onwards)

Paper : Ch-104

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Answer question No. 1 and any Five of the remaining questions.

Answer any Ten of the following questions. **(10×2=20)**

1. a) What is the significance of safety data sheets in toxic chemical handling and storage?

b) What is miniaturization? Why is it needed in modern chemical analysis?

c) Define mean, median and confidence limit.

d) What is F-test? Write its significance in Analytical chemistry.

e) What is the reason for band broadening in column chromatography?

f) What are masking and demasking agents? Give their significance in the analysis of complex matrices.

g) Explain the criteria for the selction of indicator in acid base titrations.

h) How do you estimate Fluoride by precipitation titration?

i) Write the characteristics of radiation sources in colorimetry.

j) Briefly explain Nernst distribution law.

k) Write the principle of paper chromatography.

l) If 0.239 g of a compound is dissolved in water and this solution is extracted with 50.0 mL of an organic solvent such that the concentration of the compound in the extract is 0.340g/L, calculate the percent extracted?

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2. a) List out the factors that influence the choice of Analytical methods for quantitative chemical analysis.
   b) Explain briefly on various sources and minimization of errors in chemical analysis.
   c) Distinguish between accuracy and precision with suitable examples. (3+4+3)

3. a) Explain the titration of Phosphoric acid as a function of pH.
   b) Discuss the precipitation from homogeneous solution. What are the advantage of this method? (5+5)

4. a) State Beer-Lambert's Law, give its equation and describe the limitations.
   b) Explain the standard addition and internal standard addition methods used in quantitative chemical analysis. (5+5)

5. a) Write a note on different types of solvent extraction.
   b) In a particular TLC separation, the R_f value of unknown compund was 0.819. The fronts due to compounds A, B, C were 24, 28, 30 cms and the solvent front was 34 cm. Identify the unknown compound.
   c) Discuss the principle and applications of Medium-pressure liquid chromatography technique. (3+3+4)

6. a) What is Ringbom plot? Write its importance in chemical analysis.
   b) Write a note on metal ion indicators, and their mechanism of color change at the end point of titration.
   c) Calculate the standard deviation and coefficient of variation for the data 15.89, 16.02, 15.69, 16.05, 15.72 and 16.11 mg in the chemical analysis. (3+3+4)

7. a) Explain the properties of Gaussian curve for random error distribution.
   b) Give the Principle and working of column chromatography. Mention the Factors affecting efficiency of Column Chromatography. (5+5)

8. a) Briefly explain coprecipitation and post precipitation in gravimetric analysis.
   b) Discuss the characteristics and applications of iodates in redox titrations.
   c) Discuss the principle and applications of Electrophoresis. (3+3+4)