



RA-302004

Seat No. _____

M. Sc. (Sem. II) Examination

June - 2022

**MSC1C204 : Analytical Chemistry
(New Course)**

Time : 3 Hours]

[Total Marks : 70

- Instructions :** (1) All questions are compulsory.
(2) Figures to the right indicate full marks.

- 1** Answer the following :
- (a) Explain the process of extracting metal chelates from aqueous to non-aqueous phase. **7**
- OR**
- (a) How solid phase extraction technique is useful in extraction of biological sample ? **7**
- (b) Describe in brief on accelerated and microwave assisted extraction. **7**
- OR**
- (b) Explain the effect of the pH and of the reagent concentration on the solvent extraction of metal chelates. **7**
- 2** Answer the following :
- (a) Explain the process of Hydrostatic equilibrium and Hydrodynamic equilibrium counter current chromatography. **7**
- OR**
- (a) Give the significance of plate theory and Van Deemter equation in chromatography. **7**
- (b) Give comparison between TLC and HPTLC of their salient features. **7**
- OR**
- (b) What is Chromatography ? Discuss its principle and explain its classification based on retention. **7**
- 3** Answer the following :
- (a) What is principle of conductometric titration ? Discuss various applications of conductometric titration with suitable example. **7**

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- (a) Write a short note on application of glass electrode and describe in short errors associated in pH measurement. 7
- (b) Explain modern definition of pH and discuss in brief the validity of the equation. 7
- OR
- (b) Discuss complexometry and precipitation titration based on conductance measurement. 7
- 4 Answer the following :
- (a) Explain working mechanism and application of calcium ion selective electrodes and give its application. 7
- OR
- (a) Discuss the working mechanism of CO₂ and O₂ gas sensing probe. Give their application in the analysis of environmental samples. 7
- (b) Give the classification of metallic indicator and membrane indicator electrode with suitable example. 7
- OR
- (b) How is enzyme electrode useful in analyzing organic species ? Explain with the help of an example. 7
- 5 Answer in short : (one mark each) 14
- (1) Give the relation between % extracted and distribution ratio.
 - (2) Give the equation for multiple batch extraction.
 - (3) What is distribution co-efficient ?
 - (4) What do you understand by solvent extraction ?
 - (5) Give any two application of counter current chromatography.
 - (6) Define : Dead time and dead volume.
 - (7) What is the equation of Number N in theoretical plate ?
 - (8) Give the biochemical use of chromatography.
 - (9) What is pre-concentration ?
 - (10) What are the factors that affect the conductance ?
 - (11) What is cell constant ?
 - (12) In which equation the electrode potentials are calculated ?
 - (13) What is asymmetric potential ?
 - (14) What is difference between ion and molecular selective electrode ?