



FC-302004 Seat No. _____
M. Sc. (Sem. II) Examination
June / July - 2021
MSC1C204 : Analytical Chemistry

Time : 2 Hours]

[Total Marks : 50

- Instructions :** (1) Answer only **three (3)** questions.
(2) The examination will be for **two (02)** hours.
(3) Q. No. **9** is **compulsory** and carries **14** marks.
(4) Answer any **two** questions from questions
No. **1** to **8**. Each question carries **18** marks.

- 1 Answer the following:**
 - a) Discuss different equilibria in extracting metal chelates from aqueous phase.
 - b) Write a brief note on counter – current extraction.
- 2 Answer the following:**
 - a) Derive a relation between distribution ratio and partition co-efficient with a suitable illustration. Define each term involved in the final equation and justify the relationship.
 - b) How solid phase extraction technique is useful in extraction of biological sample?
- 3 Answer the following:**
 - a) State the principle of TLC and HPTLC and give their comparative assessment.
 - b) What is Van Deemter equation? Define it term.
- 4 Answer the following:**
 - a) Write a brief note on counter-current chromatography for isolation of natural products.
 - b) Describe the principle of size exclusion chromatography. What is the exclusion limit?
- 5 Answer the following:**
 - a) Draw a diagram of glass electrode and explain its working.
 - b) Explain various application of conductometric titration with appropriate example
- 6 Answer the following:**
 - a) Explain modern definition of pH and discuss in brief the validity of the equation.
 - b) Explain in brief the components of a conductometer and give the procedure of conductivity measurement.
- 7 Answer the following:**
 - a) Write a short note on European, American and IUPAC concepts of sign convention for expressing the electrode potential.
 - b) Describe various applications of Potentiometric titrations.
- 8 Answer the following:**
 - a) Discuss briefly on saturated calomel electrode.
 - b) What is selective ratio? Discuss its significance and how you would determine its value.

9 Answer in brief: (1 mark each)

- 1) Give two applications of accelerated solvent extraction technique.
 - 2) What is the shape of spot in HPTLC?
 - 3) Define retention time, retention volume in chromatography.
 - 4) Define dead time and dead volume.
 - 5) Explain boundary potential in pH electrode.
 - 6) Give two characteristics of reference electrode.
 - 7) What do you understand by cell potential?
 - 8) Give the principle of Kohlrausch's law.
 - 9) State two factors which are responsible for analyte binding on solid phase sorbent.
 - 10) What are the homogeneous crystalline membrane electrodes?
 - 11) Which solvent are commonly used for protein precipitation?
 - 12) What is the composition of glass membranes for pH measurement?
 - 13) What is retention time?
 - 14) Give the equation to calculate number of theoretical plates in chromatography.
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