



MANIPAL
ACADEMY of HIGHER EDUCATION

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DEPARTMENT OF SCIENCES, IV SEMESTER M.Sc (CHEMISTRY)

END SEMESTER EXAMINATIONS, June 2021

SUBJECT - PRINCIPLES AND PRACTICE OF ANALYTICAL CHEMISTRY [CHM - 5008]

(REVISED CREDIT SYSTEM-2017)

Time: 2 Hours

Date: 14/06/2021

MAX. MARKS: 40

Note: (i) Answer **Any four full** questions

(ii) Draw diagrams, and write equations wherever necessary

1A. Discuss the importance of following techniques in analytical chemistry

- i) Reverse osmosis ii) Electrolytic precipitation

1B. Explain the method of determination of dissolved oxygen in a sample using polarography.

[6+4]

2A. Explain the methods used for sampling of solid and liquid samples.

2B. Write any 2 differences between the following with appropriate examples;

- i) Accuracy and Precision
ii) Wet ashing and dry ashing

[6+4]

3A. What are the various sources of error in analytical chemistry? Explain with examples.

3B. Define confidence interval. A new method (Method A) for the determination of copper in sea water of 6 different regions were compared with the existing method (Method B). Do the following results confirm a difference in the two methods at the 95 % confidence level? ($t_{\text{tab}} = 2.57$ and $F_{\text{tab}} = 2.3$ at 95% confidence level)

Samples	Method A (Cu in mg/L)	Method B (Cu in mg/L)
1	1045	1038
2	730	722

3	850	835
4	800	789
5	950	934
6	650	635

[6+4]

4A. Explain how mineral acids (any 3) were used for the decomposition and dissolution of samples.

4B. How is chronoamperometry different from chronopotentiometry ? Explain

[6+4]

5A. Explain a case of quantitative analysis, which could be conveniently carried out with potentiometry but not with conductometry.

5B. State whether the following statements are true or false by giving appropriate reasons;

- i) Azeotrope is a chemical compound not a mixture.
- ii) Gelatin is used in high concentration during polarographic analysis to reduce migration current.

[6+4]

6A. Explain with an appropriate graph, why water-ethanol mixture having a minimum in the Temperature - Composition curve cannot be separated completely into pure components?

6B. What is the difference in the principle involved in electrodialysis and electrophoresis? Explain.

[6+4]
