

C 1990

(Pages : 2)

Name.....

Reg. No.....

FOURTH SEMESTER M.Sc. DEGREE (REGULAR) EXAMINATION
MARCH 2021

(CBCSS)

Chemistry

CHE 4C 12—INSTRUMENTAL METHODS OF ANALYSIS

(2019 Admissions)

Maximum : 30 Weightage

Time : Three Hours

General Instructions

1. In cases where choices are provided, students can attend all questions in each section.
2. The minimum number of questions to be attended from the Section / Part shall remain the same.
3. There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.

Section A

Answer any eight questions.
Each question carries a weight of 1.

1. Distinguish between accuracy and precision.
2. What is a metallochromic indicator? Give two examples.
3. What is 'polarographic maxima'? How it can be suppressed?
4. Explain the principle of chronopotentiometry.
5. A solution exhibited an absorbance one ($A = 1$) at 520nm. Calculate the percentage of radiation absorbed by the solution.
6. Distinguish between SEM and TEM.
7. Comment on the complementary nature of TG and DTA.
8. Explain the significance of R_f -value in chromatography. How it is related to R_m -value.
9. Distinguish between co-precipitation and post-precipitation with suitable examples.
10. Calculate the standard deviation and coefficient of variation for the following set of analytical data for the estimation of Cu in a sample

Amount of copper : 35.46, 35.48, 35.49, 35.41, 35.47 mg.

(8 × 1 = 8 weightage)

Turn over

Section B

Answer any six questions.

Each question carries a weight of 2.

11. Discuss the application of the method of least squares for the evaluation of analytical data.
12. What are the essential requirements for a substance which can be used as an indicator in complexometric titrations? Explain.
13. Describe the advantages and disadvantages of dropping mercury electrode in polarography.
14. Give a brief account of the different types of amperometric titrations. Why this is a better method than polarographic method for quantitative analysis?
15. How does nephelometry differ from turbidimetry. Explain.
16. Briefly discuss the principle and applications of AFM.
17. Write a note on thermometric titrations.
18. What are the important detectors used in GC? Describe the working of any two such detectors.

(6 × 2 = 12 weightage)

Section C

Answer any two questions.

Each question carries a weight of 5.

19. What are the advantages and disadvantages of using organic precipitants in gravimetric analysis? Explain the application of oxine and cupferron in the gravimetric estimation of metal ions.
20. Outline the principle involved in polarography. Discuss the applications of this technique in qualitative and quantitative analysis.
21. Discuss the principle and important applications of atomic absorption spectrometry. What are the main differences between atomic absorption spectrometry and atomic emission spectrometry?
22. Write notes on :
 - (a) Auger electron spectroscopy.
 - (b) Neutron activation analysis.
 - (c) Thin layer chromatography.

(2 × 5 = 10 weightage)