

BCHET-141

ASSIGNMENT BOOKLET

**Bachelor's Degree Programme
(BSCG)**

ANALYTICAL METHODS IN CHEMISTRY

Valid from 1st January, 2024 to 31st December, 2024



**School of Sciences
Indira Gandhi National Open University
Maidan Garhi
New Delhi-110068
(2024)**

Dear Student,

Please read the section on assignments in the Programme Guide for B. Sc. that we sent you after your enrolment. A weightage of 30 per cent, as you are aware, has been earmarked for continuous evaluation, **which would consist of one tutor-marked assignment** for this course. The assignment is in this booklet, and it consists of two parts, Part A and B. It covers all blocks of the course. The total marks of all the parts are 100, of which 35% are needed to pass it.

Instructions for Formatting Your Assignments

Before attempting the assignment please read the following instructions carefully:

- 1) On top of the first page of your answer sheet, please write the details exactly in the following format:

ROLL NO.:

NAME:

ADDRESS:

.....

.....

COURSE CODE:

COURSE TITLE:

ASSIGNMENT NO.:

STUDY CENTRE: **DATE:**

PLEASE FOLLOW THE ABOVE FORMAT STRICTLY TO FACILITATE EVALUATION AND TO AVOID DELAY.

- 2) Use only foolscap size writing paper (but not of very thin variety) for writing your answers.
- 3) Leave 4 cm margin on the left, top and bottom of your answer sheet.
- 4) Your answers should be precise.
- 5) Solve Part (A) and Part (B) of this assignment, and **submit the complete assignment answer sheets within the due date.**
- 6) The assignment answer sheets are to be submitted to your Study Centre within the due date. **Answer sheets received after the due date shall not be accepted.**

We strongly suggest that you retain a copy of your answer sheets.

- 7) This assignment is **valid from 1st January, 2024 to 31st December, 2024**. If you have failed in this assignment or fail to submit it by December, 2024, then you need to get the assignment for the year 2025, and submit it as per the instructions given in the Programme Guide.
- 8) **You cannot fill the examination form for this course** until you have submitted this assignment.

We wish you good luck.

ASSIGNMENT
ANALYTICAL METHODS IN CHEMISTRY

Course Code: BCHET-141
Assignment Code: BCHET-141/TMA/2024
Maximum Marks: 100

Note: Attempt all questions. The marks for each question are indicated against it.

Par A (50 marks)

- 1 Writ the procedure for the collection and preservation of water samples. (5)
- 2 Define Indeterminate errors. How we can reduce them. (5)
- 3 What is significance of t-test? Explain using a suitable example. (5)
- 4 Which reagents are used for extraction by solvation? Give suitable examples. (5)
- 5 Briefly explain the extraction by chelation. Also give some examples of the chelating agents used. (5)
- 6 Explain continuous extraction with the help of a suitable diagram. Which factors govern the efficiency of such extractions? (5)
- 7 Draw a flow chart for the classification of various types of chromatographic techniques. (5)
- 8 List different criteria for choosing the mobile phase used in paper chromatography. (5)
- 9 Discuss the principle of coloumn chromatography illustrating the experimental setup. (5)
- 10 Briefly explain various types of capacities associated with ion exchangers. (5)

Par B (50 marks)

- 11 Discuss the factors which limit the accuracy of pH measurements. (5)
- 12 Discuss design and working of silver-silver chloride electrode. (5)
- 13 How the conductance is varies with concentration? Explain with the help of suitable examples. (5)
- 14 Explain ionic nobilities and transport number. (5)
- 15 Taking suitable examples explain the effect of furnace atmosphere on TG curves. (5)
- 16 An impure sample of $\text{CaC}_2\text{O}_4 \cdot \text{H}_2\text{O}$ is analyzed using TGA technique. TG curve of the sample indicates the total mass change from 85 mg to 30.7 mg when this sample was heated up to 1173 K. calculate the purity of the sample. (5)
- 17 Write the shortcomings of wave model of electromagnetic radiation. Describe the model that was able to explain these shortcomings. (5)
- 18 Write the expression of Lambert's and Beer's law. List the factors responsible for the deviation from Beer-Lambert's law. (5)
- 19 What is the necessary condition for observing IR spectrum? Describe in brief the (5)

types of vibrations for a polyatomic molecule.

20 How are the signals in an atomic spectrum characterized? Illustrate your answer. (5)