



**Progressive Education Society's
Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16
End Semester Examination: October 2024
Faculty: Science and Technology**

Program: B.Sc.

Semester: I

SET: A

Program (Specific): Chemistry

Course Type:

Class: T.Y.B.Sc

Max.Marks: 35

Name of the Course: Analytical Chemistry-I

Course Code: 24-CH-502

Time: 2Hr

Paper: II

Instructions to the candidate:

- 1) There are 4 sections in the question paper. Write each section on a separate page.*
- 2) All Sections are compulsory.*
- 3) Figures to the right indicate full marks.*
- 4) Draw a well labeled diagram wherever necessary.*

SECTION: A

Q1) Multiple choice question

5

1. In order to have precipitation, the solution should be _____
a) saturated b) unsaturated c) supersaturated d) dilute
2. In inorganic qualitative analysis, cations are divided into _____ groups.
a) 6 b) 5 c) 7 d) 4
3. Upward peak in a DTA curve indicates _____
a) exotherms b) endotherms c) thermal stability d) water of crystallization
4. _____ is the standard agency for water testing parameters.
a) NIST b) WHO c) EPA d) APHA
5. A sample exhibited has an absorbance of 1.0 in UV-Visible spectroscopy. The percentage transmittance will be _____
a) 1% b) 10% c) 0.01 % d) 0.1 %

Q2) Very short answer questions (Attempt any 4/6)

4

1. Absorbance
2. Gravimetric analysis
3. Buffer solution
4. Thermal methods of analysis
5. Accuracy
6. Lambert's Law

SECTION: B

Q3) Short answer questions (Attempt any 4/6)

8

1. What is the molar extinction coefficient? Give the equation.
2. What do you mean by a calibration curve?
3. Draw a typical DTA curve.
4. What is a group reagent? Give one example.
5. What is the effect of a common ion on its solubility?
6. Enlist the detectors used in UV-Visible spectrophotometer.

SECTION: C

Q4) Short answer questions (Attempt any 4/6)

8

1. Write the difference between single beam and double beam spectrophotometer.
2. Give any four criteria for choosing an analytical method.
3. Give the information which can be obtained from a TG curve.
4. What is a silver mirror test?
5. What is the effect of temperature on the solubility of precipitate?
6. Calculate the molar absorptivity of 1.8×10^{-5} M solution having 0.35 absorbance when placed in a cell of 1.5 cm path length.

SECTION: D

Q5) Solve the following (Any two)

10

1. The light absorbed by a 2.5×10^{-3} M solution of a substance was found to be 25% at λ_{max} , when placed in a cell of unit pathlength. Find absorbance, molar absorptivity and transmittance of the solution.
2. A thermogram of a Mg compound shows a mass loss of 91.0 mg from a total of 175.0 mg used for the analysis. Identify the compound as either MgO, MgCO_3 or MgC_2O_4 .
3. Following weights were obtained by a person on repeating the same experiment four times i.e. 29.8 mg, 30.2 mg, 28.6 mg and 29.7 mg. Calculate the mean deviation, standard deviation and relative mean deviation in the results.