

BACHELOR OF SCIENCE (CBCS - 2016 COURSE)
T. Y. B Sc. Sem-V : WINTER :- 2021
SUBJECT: CHEMISTRY : ANALYTICAL CHEMISTRY-I

Day : Thursday
Date 27-01-2022

W-14942-2021

Time : 02:00 PM-05:00 PM
Max. Marks: 60

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.

Q.1 Attempt **ANY TWO** of the following: [12]

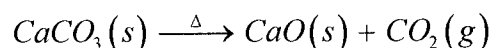
- a) Define angle of specific rotation and describe the measurement of it by using a polarimeter.
- b) Explain the role and technique of digestion in purification of precipitate.
- c) Write the principle of AAS. Give the construction and working of hollow cathode lamp in AAS.

Q.2 Attempt **ANY TWO** of the following: [12]

- a) Explain construction and working of turbidimeter.
- b) Classify the thermal methods of analysis and explain the instrumentation of TGA.
- c) What is polarimeter? Explain the measurement of optical rotation of optically active substance by using polarimetry.

Q.3 Attempt **ANY TWO** of the following: [12]

- a) For given sucrose ($C_{12}H_{22}O_{11}$) solution and its $[\alpha]^{20} = +63.6^\circ$. Calculate its molecular rotation and also calculate the angle of rotation for the solution containing 20 gm/lit in a 12 cm cell.
- b) The solubility of AgCl in water is 1.55×10^{-3} per litre at $27^\circ C$. Calculate solubility product of AgCl [Atomic weight Ag = 108 Cl = 35.5].
- c) Calculate the % mass loss for the following reaction:



(Molecular weight of $CaCO_3 = 100$, $CaO = 56$, $CO_2 = 44$)

Q.4 Attempt **ANY THREE** of the following: [12]

- a) Discuss co-precipitation in gravimetric analysis.
- b) What are the conditions an ideal wash liquid should satisfy?
- c) Give applications of AAS.
- d) Discuss the determination of molecular weight of high polymers by turbidimetry.

Q.5 Attempt **ANY FOUR** of the following: [12]

- a) State and explain the term solubility product with example.
- b) Write a note on principle of TLC.
- c) Explain principle of DTA and draw a typical DTA curve.
- d) Give an account of the factors affecting the measurement in turbidimetry.
- e) Define the following terms:
 - i) Specific rotation
 - ii) Molar rotation
 - iii) Plane of polarization
- f) Discuss the importance of common ion effect in gravimetric analysis.

* * * *