

BACHELOR OF SCIENCE (CBCS-2018 COURSE)
T. Y. B. Sc. Sem-V : WINTER :- 2021
SUBJECT: CHEMISTRY : ANALYTICAL CHEMISTRY-I

Day : Thursday
Date 27-01-2022

W-18417-2021

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.
 - 3) Draw neat diagrams **WHEREVER** necessary.
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- Q.1** Attempt **ANY TWO** of the following : **(12)**
- a) What is polarimeter? Explain the measurement of optical rotation of optically active substance by using polarimeter.
 - b) What is solubility and solubility product? Explain importance of solubility product in gravimetric analysis.
 - c) Explain any two applications of turbidimetry and nephelometry.
- Q.2** Attempt **ANY TWO** of the following : **(12)**
- a) Discuss instrumentation of TGA with a neat labeled diagram.
 - b) How are spectral and chemical interferences prevented or corrected in AAS determination.
 - c) Explain the role and technique of digestion in purification of a precipitate.
- Q.3** Attempt **ANY TWO** of the following : **(12)**
- a) The solubility product of PbI_2 is 1.584×10^{-9} at $30^\circ C$. Calculate the solubility of PbI_2 in grams per litre and gram moles per litre (Mol. Wt. of $PbI_2=462$).
 - b) The specific rotation of fructose containing 6 gm per litre is to be determined when angle of rotations $+3.5^\circ$ and tube length is 30 cm. calculate specific rotation and also molar rotation of fructose ($C_6H_{12}O_6$).
 - c) A mixture of CaO and $CaCO_3$ is analyzed by TGA. The result indicates that mass of the sample decreases from 250.6 mg to 190.8 mg only between $600^\circ C$ and $900^\circ C$. Calculate the percentage of calcium carbonate in the mixture.
- Q.4** Attempt **ANY THREE** of the following : **(12)**
- a) What are thermal methods of analysis? Give the classification of thermal methods of analysis.
 - b) Explain the construction and working of nephelometer.
 - c) What is homogeneous precipitation? What are its advantages?
 - d) Explain the terms : i) interferences ii) atomizer iii) common ion effect iv) photomultiplier tube.
- Q.5** Attempt **ANY FOUR** of the following : **(12)**
- a) Give the conditions for ideal wash liquid.
 - b) Explain the principle of DTA and name the components of a DTA apparatus.
 - c) Explain the difference between turbidimeter and nephelometer.
 - d) Explain the term optical activity used in polarimeter.
 - e) What is post precipitation? Explain it with suitable examples.
