

Reg. No. : .....

Name : .....

**II Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/  
Improvement) Examination, April 2022  
(2019 Admission Onwards)  
CORE COURSE IN CHEMISTRY  
2B03CHE : Analytical and Inorganic Chemistry – I**

Max. Marks : 40

Time : 3 Hours

*Instruction : Answer the questions in English only.*

## SECTION – A

Very short answer type. **Each** carries 1 mark. Answer **all 4** questions.

- Name the alkaline earth metal hydroxide that shows amphoteric behaviour.
- What is meant by conjugate acid-base pairs ?
- Give an example for a metallochrome indicator.
- Arrange the Boron halides in the increasing order of Lewis acidity. **(4×1=4)**

## SECTION – B

Short answer type. **Each** carries 2 marks. Answer **7** questions out of 10.

- Which is more stable –  $PbI_4$  or  $SnI_4$  ? Explain.
- How is borate in an inorganic mixture eliminated ?
- Illustrate the autoionisation of liquid HF and  $H_2SO_4$ .
- Explain Lux-Flood concept of acids and bases with examples.
- Which is the weakest acid among hydrogen halides ? Why ?
- Give any two essential characteristics of a primary standard.
- Comment on the thermal stability of alkali metal carbonates.
- Water is a liquid at room temperature whereas  $H_2S$  is a gas. Why ?
- Distinguish between accuracy and precision.
- What are redox indicators ? **(7×2=14)**

P.T.O.



## SECTION – C

Short essay/problem type questions. **Each** question carries 3 marks. Answer 4 questions out of 6.

- Write a note on the Ostwald's theory of acid base indicators.
- How is Boron different from rest of the elements in group 13 ?
- Compare the acidic strengths of oxoacids of chlorine. Give reasons for the order of acidity.
- What is co-precipitation ? Give any two methods for minimizing co-precipitation.
- In an analysis of an ore, the percentages of an element were found to be 65.55, 65.90, 67.85, 66.85, 69.90 and 65.00. The value 69.90 appears to be suspect. Ascertain whether this should be retained or rejected. The  $Q_{critical}$  for 6 observations at 90% confidence level is 0.56.
- How can errors be classified ? **(4×3=12)**

## SECTION – D

Long essay type. **Each** carries 5 marks. Answer 2 questions out of 4.

- Discuss the role of solubility product in the precipitation of various cations in different groups in qualitative analysis.
  - Describe various types of reactions in liquid ammonia as a solvent.
  - What are adsorption indicators ? Explain their mechanism of action.
  - How does the boiling point and basicity of group 15 hydrides vary along the group ? Explain. **4**
    - Phosphorous forms pentahalide while Nitrogen does not. Why ? **1**
- (2×5=10)**