



WINTER-2023	
Exam Seat No.:	
Academic Year:2023-2024	Semester:I
Name of Programme:B.Tech	Pattern:2023
Name of Course:Applied Chemistry	Course Code:2300104A
Max. Marks:60	Duration:2.50

**Instructions:** Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 02 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

**Question No. 1 Attempt following Question**

- 1 a) Explain pH metric titration of strong acid verses strong base with titration curve and reaction (6) CO1

**Question No. 2 Attempt following Question**

- 2 a) Draw neat labelled diagram of Bomb calorimeter and give formula to calculate GCV (3) CO4
- 2 b) The coal containing 5 % hydrogen (dry / moisture free basis) has gross calorific value of 5000 cal/ gm. Calculate Net Calorific Value of Coal. Latent heat of water vapour is 580 cal/ gm. (3) CO2

**Question No. 3 Attempt following Question**

- 3 a) Give coordination number of Simple cubic and Body centred cubic crystal. Distinguish between Crystalline and Amorphous solid (6) CO2

**OR**

- 3 b) Define Alloys. Explain the fusion method of preparation of Brass Alloys (6) CO2
- 3 c) Define conducting Polymer? State its types? Explain p-doped and n-doped ICP with doping reaction with two applications (6) CO2

**OR**

- 3 d) What are structural requirement for biodegradable polymers? Give structure, properties and applications of PHBV (6) CO2
- 3 e) Define the following terms (4) CO1

1. Metallurgy 2.Ores 3. Gangue 4. Flux

**OR**

- 3 f) What is nanomaterial? Classify it according to the dimension (4) CO1

**Question No. 4 Attempt following Question**

- 4 a) Explain Mohr's method for determination of chloride content from it with procedure, reactions and formulae. Name the indicator used in this method (6) CO3

**OR**

- 4 b) Explain EDTA method for determination of hardness of water with principle, process, reactions and formulae of total hardness (6) CO3

- 4 c) Explain Zeolite method for water softening with neat labelled diagram, procedure, water softening and regeneration reactions (6) CO4

**OR**

- 4 d) Explain Reverse osmosis process for purification of water with diagram, process, advantages and applications. (6) CO4

- 4 e) 50 ml of water requires 10.2 ml, 0.02 M disodium EDTA for end point in titration. 50 ml of the same water sample after boiling and filtration takes 4.0 ml of the disodium EDTA for end point in titration .Calculate total and permanent hardness of water sample (4) CO4

**OR**

- 4 f) 75 ml of water sample when titrated in Mohr's method requires 7.5 ml of 0.02 N  $\text{AgNO}_3$  for brick red end point. Calculate the amount of chloride ions present in water sample. (4) CO4

**Question No. 5 Attempt following Question**

- 5 a) What is Pilling Bed-worth Ratio? Give its significance. Explain the different types of Oxide films formed in atmospheric corrosion (6) CO3

**OR**

- 5 b) Explain oxide film formation mechanism of dry corrosion with diagram and reaction. Give the type of oxide film formed by Na and Cu metal (6) CO3

- 5 c) What is wet Corrosion. Explain the hydrogen evolution mechanism of wet corrosion with neat labelled diagram (6) CO3

**OR**

- 5 d) Explain any six factors affecting the rate of corrosion (6) CO3

- 5 e) What is the cathodic Protection? Explain any one method of it. (4) CO5

**OR**

- 5 f) What is Galvanization? Explain the process with diagram and applications (4) CO5