



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

SUMMER-2024	
Exam Seat No.:	
Academic Year: 2023-2024	Semester: II
Class: FY	Program: B.Tech
Branch Code: FYE	Pattern: 2023
Name of Course: Applied Chemistry	Course Code: 2300104A
Max. Marks: 60	Duration: 2.30 Hrs.

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) What is a secondary battery? Explain the construction and operation of a dry cell, with diagram, reactions and one application. (6) CO4

Question No. 2 Attempt following Question

- 2 a) What are the advantages and limitations of biodiesel? (3) CO4
- 2 b) 1.72 gm of a fuel when burnt in a bomb calorimeter increased the temperature of water from 20.4°C to 27.1°C. If the calorimeter contains 1850 gm of water and its water equivalent is 375 gm, calculate the GCV of the fuel. (3) CO4

Question No. 3 Attempt following Question

- 3 a) Calculate atomic radius of body centred cubic and face centred cubic systems. (6) CO2

OR

- 3 b) What is the coordination number of body centred cubic and face centred cubic crystal? Compare between crystalline and amorphous solid. (6) CO2

- 3 c) Define conducting polymers and discuss the different types. Explain the processes of p-doping and n-doping in conducting polymers with reactions? (6) CO2

OR

- 3 d) Illustrate the various factors involved in bio-degradation of polymer. Describe in detail properties and applications of biodegradable polymer. (6) CO2

- 3 e) Give classification of nanomaterials based on dimensions with example. (4) CO1

OR

- 3 f) What is the composition of brass and bronze alloy? Give its properties and applications. (4) CO1

Question No. 4 Attempt following Question

- 4 a) Define the terms vapour pressure and viscosity. Distinguish between flash point and fire point (6) CO3

OR

- 4 b) Explain in brief boiler corrosion with causes, reactions and preventive measures. (6) CO3

- 4 c) Explain Mohr's method for determination of chloride content, outlining the procedure, reactions, and formulas involved. Identify the indicator utilized in this method. (6) CO2

OR

- 4 d) Explain the deionisation method for water softening, with procedure, diagram, water softening and regeneration reactions. (6) CO2

- 4 e) Zeolite bed exhausted by softening 4500 litres of a water sample requires 15 litres of 10% NaCl solution for regeneration. Calculate the hardness of the water sample. (4) CO4

OR

- 4 f) 100 ml of water requires 12.3 ml, 0.02 M disodium EDTA for end point in titration. 100ml of the same water sample after boiling and filtration takes 6.5 ml of the disodium EDTA for end point in titration. Calculate total and permanent hardness of water sample. (4) CO4

Question No. 5 Attempt following Question

- 5 a) State Pilling Bed-worth Rule? Give its significance. Explain the mechanism of corrosion due to oxygen. (6) CO3

OR

- 5 b) Define corrosion. Explain any six factors influencing the rate of corrosion. (6) CO3

- 5 c) What is electrochemical corrosion? Discuss the hydrogen evolution mechanism with diagram and reactions. (6) CO3

OR

- 5 d) What is wet corrosion? Discuss the oxygen absorption mechanism of wet corrosion with diagram and reactions. (6) CO3

- 5 e) Give principle of cathodic protection? Explain impressed current method of corrosion control. (4) CO5

OR

- 5 f) Distinguish between anodic and cathodic coatings. (4) CO5

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