



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

SUMMER-2023	
Exam Seat No.:	
Academic Year: 2022-2023	Semester: II
Name of Programme: B.Tech	Pattern: 2022
Name of Course: Applied Chemistry	Course Code: FYE221005
Max. Marks:60	Duration:2.30

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 Draw and explain the various stages of conductometric titration of HCl vs. NaOH with procedure, titration curve and reaction. (6) CO1

Question No. 2 Attempt following Question

- 2 Explain the process of fractional distillation of petroleum with diagram. Give the composition, boiling range of petrol and diesel (6) CO1

Question No. 3 Attempt following Question

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

OR

- 3.b) What is atomic packing Factor (APF)? Calculate number of atoms per unit cell and APF for face centred cubic (FCC) unit cell with neat labelled diagram. (6) CO2

- 3.c) What is polymer composite? What are the constituents of polymer composite? What are the types of polymer matrix? Give Properties of polymer composites. (6) CO2

OR

- 3.d) What is doping? Explain P-doping and n-doping with chemical reactions. Give applications of Polyacetylene. (6) CO2

3.e) Give properties and applications of Nanomaterials. (4) CO1

OR

3.f) Give composition, properties and application of the bronze alloy. (4) CO1

Question No. 4 Attempt following Question

4.a) Discuss determination of chloride content by Mohrs method with procedure, reactions and formulae. (6) CO3

OR

4.b) Define gas response and response time. Explain metal oxide based gas sensor. Give common applications of gas sensor. (6) CO3

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

OR

4.d) Explain zeolite method of water softening with process, diagram, softening reactions and regeneration reactions involved. (6) CO4

4.e) A zeolite bed exhausted by softening 4000 litres of a water sample requires 10 litres of 15 % NaCl solution for regeneration. Calculate the hardness of the water sample. (4) CO4

OR

4.f) 100 ml of water sample requires 18.5 ml, 0.02 M disodium EDTA for end point in titration. 100 ml of the same water sample after boiling and filtration takes 4.5 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) Explain oxygen absorption mechanism of wet corrosion with neat labelled diagram. (6) CO3

OR

5.b) Explain metal oxide film formation mechanism of dry corrosion with diagram and reaction. Give the types of oxide film formed by Au and Al metal. (6) CO3

5.c) Compare anodic and cathodic type of metallic coatings. Which is more protective and Why? (6) CO5

OR

5.d) What is electroplating? Explain the process with diagram, reactions and applications. (6) CO5

5.e) What is Galvanization? Explain the process with diagram and applications. (4) CO3

OR

5.f) Explain any 4 factors affecting rate of corrosion based on nature of metal. (4) CO3