



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: IV
Branch Code: SY-B.Tech Chemical Engineering	Pattern: 2022
Name of Course: Chemistry II	Course Code: CHE222011
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 _____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 Discuss any three principles of green chemistry. (6) CO1

Question No. 2 Attempt following Question

- 2 Explain Effective atomic number (EAN) and find the EAN of $[\text{Fe}(\text{CO})_5]$ and $\text{K}_3[\text{Fe}(\text{CN})_6]$. Do the complexes obey the EAN rule or not. (6) CO2

Question No. 3 Attempt following Question

- 3.a) Explain the strong acid and strong base titration with the help of titration curve and appropriate indicators. (6) CO3

OR

- 3.b) Discuss different types of volumetric analysis with suitable examples. (6) CO3

- 3.c) Explain theory of indicators and also explain a difference of 2 p^{H} is required for colour change. (6) CO3

OR

- 3.d) What is precipitation titration? Discuss it using Mohrs method. (6) CO3

- 3.e) The concentration NaOH is 0.5M if 20ml is needed to titrate 35ml of acid calculate the concentration of the acid? (4) CO3

OR

- 3.f) 20 ml of 0.10N, HCl is added from burette is added into 15 ml 0.11N NaHCO_3 solution in the flask. Calculate pH of the titration mixture. (4) CO3

Question No. 4 Attempt following Question

4.a) What is adsorption isotherm? Deduce the Langmuir adsorption isotherm equation. (6) CO4

OR

4.b) What is adsorption isotherm? Describe Freundlich adsorption isotherm. (6) CO4

4.c) Discuss in details the adsorption mechanism involve in the catalysis reaction. (6) CO4

OR

4.d) What are zeolites? Give applications of zeolites in chemical industry. (6) CO4

4.e) Discuss application of catalyst in the synthesis of industrially important chemicals. (4) CO4

OR

4.f) Discuss the synthesis of aldehyde using hydroformylation reaction. (4) CO4

Question No. 5 Attempt following Question

5.a) Explain various types of conformation in ethane molecule using P.E. diagram (6) CO5

OR

5.b) Draw the structure of various conformers of n-butane using Newman projection formula. (6) CO5

5.c) Give mechanism, thermodynamics and kinetics of nitration reaction of benzene. (6) CO5

OR

5.d) Give mechanism, thermodynamics and kinetics of vinyl chloride formation reaction. (6) CO5

5.e) Explain the terms enantiomers and diastereomers with examples. (4) CO5

OR

5.f) Give brief description of optical isomerism. (4) CO5

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