

24P409

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Name:

Reg.No:

FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2026

(CBCSS - PG)

(Regular/Supplementary/Improvement)

CC19PCHE4E05 - INDUSTRIAL CATALYSIS

(Chemistry)

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

(Draw neat sketches, wherever necessary)

Section A

Answer any ***eight*** questions. Each question carries 1 weightage.

1. What are the factors affecting adsorption ?
2. Explain the role of adsorption in heterogeneous catalysis and describe how it affects the reaction rate.
3. Explain the role of diffusion in determining the selectivity of a catalytic reaction.
4. Discuss zeolite nucleation.
5. Discuss about different types of catalytic poisons.
6. Discuss about the regeneration of poisoned catalyst.
7. Explain the use of dual phase transfer catalysts. Give examples.
8. Briefly discuss the kinetics of enzyme catalysed reactions.
9. Discuss the major types of hydrocarbon cracking processes and their industrial significance.
10. Explain steam cracking.
11. Explain Cativa process.
12. Explain the major three steps involved in the Wacker process.

(8 × 1 = 8 Weightage)

Section B

Answer any ***four*** questions. Each question carries 3 weightage.

13. Explain adsorption hysteresis and capillary condensation.
14. Differentiate between Langmuir Hinshelwood model and Rideal model of catalytic reaction.
15. Discuss mercury intrusion method for determination of pore size of catalyst.

16. What is deactivation of catalyst? Explain different deactivation process.
 17. Explain the importance of quaternary ammonium salts as phase transfer catalysts.
 18. Explain the kinetics of enzyme catalysed reactions.
 19. Discuss different catalytic processes used for the protection of environment. Give example for each.
- (4 × 3 = 12 Weightage)**

Section C

Answer any *two* questions. Each question carries 5 weightage.

20. Derive BET adsorption isotherm. How would you determine surface area of a solid using BET adsorption isotherm.
 21. Write a note on catalyst support.
 22. Describe the steps involved in PTC and explain the variables which affects the rates of PTC.
 23. Explain propene polymerization with silica supported metallocene/MAO catalysts.
- (2 × 5 = 10 Weightage)**
