

C 1992

(Pages : 2)

Name.....

Reg. No.....

**FOURTH SEMESTER M.Sc. DEGREE (REGULAR) EXAMINATION
MARCH 2021**

(CBCSS)

Chemistry

CHE 4E 05—INDUSTRIAL CATALYSIS

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend all questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Section A

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

1. Define isosteric heat of adsorption. How is it measured ?
2. Distinguish between activated and non-activated adsorption.
3. Unimolecular surface catalysed gas phase reactions follow first order kinetics at low pressures and zero order kinetics at high pressures. Why ?
4. Distinguish between reactant selectivity and product selectivity.
5. How do you determine pore size distribution of a catalyst ?
6. Explain 'Coking' of catalyst.
7. Explain with example 'immobilized biocatalysts'.
8. Quarternary ammonium salts are used as phase transfer catalysts. Why ?
9. Name two cracking catalysts in petroleum industry. Justify your answer.
10. What is MAO ? How does it function as catalyst ?

(8 × 1 = 8 weightage)

Turn over

Section B

Answer any six questions.

Each question carries a weightage of 2.

11. Draw potential energy curves for physisorption and chemisorption. Discuss.
12. Discuss mechanism of diffusion controlled reactions.
13. Briefly discuss shape selective catalysis by zeolites.
14. What are the mechanisms of catalyst poisoning ? Discuss.
15. Discuss application of PEG in phase transfer catalysis.
16. Write a brief account of the specific catalytic groups in enzyme catalysis.
17. Briefly discuss Mobil process for conversion of methanol to hydrocarbons.
18. Name one catalyst employed for hydroformylation. How does it function ?

(6 × 2 = 12 weightage)

Section C

Answer any two questions.

Each question carries a weightage of 5.

19. Briefly discuss Absolute Rate Theory as applied to chemisorption.
20. Briefly discuss electronic factors in catalysis by metals.
21. Write a brief account of the various methods for determination of surface acidity.
22. What are the methods for the determination of surface area of a solid ?

(2 × 5 = 10 weightage)