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Name.....

Reg. No.....

**FOURTH SEMESTER M.Sc. (CBCSS) (REGULAR/SUPPLEMENTARY)
DEGREE EXAMINATION, APRIL 2025**

Chemistry

CHE4E05—INDUSTRIAL CATALYSIS

(2019 Admission onwards)

Time : Three Hours

Maximum Weightage : 30

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

1. Explain capillary condensation.
2. How would you distinguish between Physisorption and Chemisorption experimentally ?
3. Explain the term 'adsorption equilibrium'.
4. What do you mean by transition state selectivity ?
5. What is the role of support in catalysis ?
6. Catalysts prepared at very high temperatures have low surface area. Why ?
7. With the help of an example explain the use of cocatalyst in phase transfer catalysis.
8. Define Michael's Menton constant. Explain its significance.
9. Explain the term 'TWO' with reference to automobile exhausts.
10. Name one metallocene as catalyst. Explain its function.

(8 × 1 = 8 weightage)

Section B*Answer any **six** questions.**Each question carries a weightage 2.*

11. Write BET adsorption isotherm in the linear form. Show that it approximates to Langmuir adsorption isotherm under limiting condition. What is the limiting condition ?
12. Discuss the role of chemisorptive bond strength on the rate of surface catalysed reaction.
13. 130 ml. of N₂ (corrected to STP) is required to form a monolayer on 1 g. of a solid. Find the surface area. The cross-sectional area of N₂ is 16.2 Å².

Turn over

14. What are the methods of catalyst regeneration ? Discuss.
15. Write a brief account of the compounds used as phase transfer catalysts.
16. What is the role of binding energy of enzyme and the substrate on the catalytic activity ? Explain.
17. Briefly discuss Fischer Tropsch process.
18. Discuss catalytic oxidation of ethylene using Palladium

(6 × 2 = 12 weightage)

Section C

*Answer any **two** questions.*

Each question carries a weightage 5.

19. Write a brief account of catalysis by semiconducting oxides.
20. Discuss briefly structure of zeolites.
21. What is Ziegler Natta catalyst ? Discuss its function.
22. Briefly discuss Absolute Rate Theory as applied to chemisorption.

(2 × 5 = 10 weightage)