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C 80681 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, MARCH 2020

(CUCSS)

Chemistry

CH 4E 05—INDUSTRIAL CATALYSIS

Time : Three Hours Maximum : 36 Weightage

Section A

Answer **all** *questions.*
Each question carries a weightage of 1.

1. Distinguish between activated and non-activated adsorption.
2. Explain capillary condensation.
3. What do you mean by percentage and character of a metal ?
4. Unimolecular gas phase surface catalysed reactions follow first order kinetics at low pressures and zero order kinetics at high pressures. Justify.
5. What is the role of support in catalysis ?
6. Explain with example 'shape selective catalyst'.
7. What is 'cooking' ?
8. Explain with example 'phase transfer catalysis'.
9. What are the methods of immobilization of enzymes ?
10. Name two cracking catalysts. Explain the function of one of them.
11. Transition metals are generally used as hydrogenation catalysts. Why ?
12. What is hydroformylation ? Name the catalyst.

(12 × 1 = 12 weightage)

Section B

Answer any **eight** *questions.*
Each question carries a weightage of 2.

13. Draw potential energy curves for physisorption and chemisorption. Discuss.
14. Write BET adsorption isotherm. How would you determine surface area of a solid using BET isotherm ?
15. Briefly discuss geometric factors in catalysis.
16. Discuss electron band theory of catalysis by metals.

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17. Discuss the role of macrocyclic compounds in phase transfer catalysis.
18. What are the methods of regeneration of catalysts ? Explain.
19. Name two catalysts employed in hydro-desulphurization. Discuss their action.
20. Briefly discuss thermodynamic of enzyme catalysis.
21. How do you classify porosity based on hysteresis loops ? Discuss.
22. Briefly explain the working of a catalytic converter in automobile exhaust.
23. Discuss the role of activated charcoal as a support.
24. Discuss Pd catalysed oxidation of ethylene.

(8 × 2 = 16

Section C

Answer any **two** *questions.*
Each question carries a weightage of 4.

25. Discuss Absolute Rate Theory as applied to chemisorption.
26. Write a brief account of diffusion controlled reactions.
27. Write a brief account of structure of zeolites.
28. Briefly discuss Fischer Tropsch process.

(2 × 4 = 8 we

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