

2017
CHEMISTRY
Paper : 402 (P)

CATALYSIS

Full Marks: 80

Time: 3 hours

The figures in the margin indicate full marks for the questions

1. Define coking of catalyst. How can it be prevented? 2
2. What do you mean by Fermi level and Fermi energy? 3
3. What is the role of support in catalyst systems? 4
4. Answer the following questions: 5×5 = 25
 - a) Discuss the thermodynamics of adsorption.
 - b) Explain the boundary layer theory of chemisorption?
 - c) Write about the use of catalyst in the chemical industries.
 - d) "Catalysts are shape and size selective." Verify this statement with examples.
 - e) Discuss different types of solid catalysts and their applications.
5. Write briefly about the treatment of industrial effluents. 6

6. How Zeolites and Zeotypes are prepared? Discuss the unique properties of them which make them useful as heterogeneous catalyst. 9
7. Write about the processes of deactivation of catalysts. How can it be prevented? Give a brief idea about the catalyst regeneration and disposal techniques. $6+2+4 = 12$
8. Explain the process of refining of crude petroleum. 10
9. Write short notes on: $3 \times 3 = 9$
- a) Metal oxide catalysts and skeletal catalysts
 - b) Control of pollution from automobile exhaust
 - c) Acidic clays and their catalytic activity
