

22P113

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Name:

Reg.No:

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2022

(CBCSS - PG)

(Regular/Supplementary/Improvement)

CC19P CHE1 C04 - THERMODYNAMICS, KINETICS AND CATALYSIS

(Chemistry)

(2019 Admission onwards)

Time : 3 Hours

Maximum : 30 Weightage

Section A

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

1. What is meant by activity coefficient ?
2. What is nonequilibrium processes?
3. Write a note on thermal diffusion
4. What is the difference in mechanism proposed for the decomposition of acetaldehyde obeying 3/2 order kinetics and 1/2 order kinetics ?
5. What are branching chain reaction? Explain with examples.
6. What is meant by flash photolysis?
7. What is meant by a potential energy surface?
8. Define adsorption isostere.
9. Explain the terms with examples (a) acid catalysis and (b) base catalysis.
10. Discuss the properties of zeolites that make them useful as heterogeneous catalysts.
11. What is the effect of temperature and pressure in the reaction of H₂ and O₂?
12. What is the significance of BET equation in adsorption studies?

(8 × 1 = 8 Weightage)

Section B

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

13. What is Stirling's approximation? What is the importance in statistical thermodynamics?
14. Provide a molecular interpretation for the positive and negative deviations in the boiling point curves and the formation of azeotropes.
15. Explain electro-kinetic effects.

16. What is primary salt effect?
17. Discuss the Lindemann's theory of unimolecular reactions.
18. Explain Eley Rideal mechanism.
19. Write a note on biocatalysis.

(4 × 3 = 12 Weightage)

Section C

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

20. Derive Duhem-Margule relation and explain its applications.
21. Discuss the ART for reaction rates. Derive the Eyring equation.
22. Explain different methods for the determination of surface area and pore structure of adsorbents.
23. Explain the mechanisms of oscillating reactions.

(2 × 5 = 10 Weightage)
