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B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2013

MATERIAL SCIENCE AND ENGINEERING

Semester 2

CY 8201 Chemical Reaction Dynamics

(Regulation 2012)

25

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Mention the difference between crystalline and amorphous solids?
2. What is plane of symmetry?
3. What is a consecutive reaction? Give an example.
4. What are the steps involved in chain reaction?
5. Briefly explain what a chromatogram is?
6. State the use of BET theory?
7. What is a topotactic reaction?
8. What is Kirkendall effect?
9. Give the principle of plasma fusion method?
10. What do you mean by intercalation?

Part – B (5 x 16 = 80 marks)

11. (i) What is chemical bonding? What are its types? Explain their properties with suitable examples. 10
(ii) Give an account on stoichiometric point defects. 6
 12. a) (i) What are the postulates of absolute reaction rate theory? 6
(ii) Derive an expression for the effect of temperature on the reaction rate. 10
- OR**
- b) (i) What are the factors that determine the reaction rates in solution? 6
(ii) Derive an expression for the effect of internal pressure on the rate of reaction. 10

13. a) (i) Explain the mechanism of unimolecular surface reactions in detail. 10
(ii) Explain the Langmuir Hinshelwood mechanism briefly. 6
- OR**
- b) (i) Explain the mechanism of a bimolecular surface reaction. 10
(ii) Briefly explain the Freundlich mechanism. 6
14. a) (i) Explain the process of solidification by nucleation and growth. 6
(ii) Explain the various factors that influence the reactivity of solids with suitable examples. 10
- OR**
- b) (i) Illustrate the use of co-precipitation as a precursor to solid state reaction. 6
(ii) Explain the experimental procedure followed for an effective solid state reaction. 10
15. Discuss the principle, construction and procedure of **any four** of the following preparative methods: 16
- (i) Microwave synthesis
 - (ii) CVD
 - (iii) Hydrothermal methods
 - (iv) Czochralski process
 - (v) Electrochemical methods
 - (vi) Zone refining