



DJJ-003-010415

Seat No. _____

M. Sc. (Sem. IV) (CBCS) Examination

May / June - 2015

Reaction Kinetics and Mechanisms

(Elective - I)

Faculty Code : 003

Subject Code : 010415

Time : Hours]

[Total Marks : 70

- Instructions :** (1) Answer all the questions.
(2) All questions carry equal marks.

Q1. Answer the following (Any Seven):

- Define: Actinometer, Collision number, Enzyme, Promoters.
- Give an account of Flash Photolysis method.
- Fill in the blanks:
 - Reactions in solution depend on ----- and ----- of solution.
 - Enzymes are produced by ----- and -----.
- Discuss the reaction mechanism of reaction between ammonium cyanate and urea.
- What is catalysis? What are the different types of catalysts? Give one example of each.
- Discuss failures of collision theory.
- Explain metallic mirror method for the detection of free radicals in chain reactions.
- Differentiate between enzyme catalysis and general heterogeneous catalysis.
- Give the reactions for photolysis of ammonia.
- Define acid-base catalysis. State different types of acid-base catalysis.

Q2. Answer the following (Any Three):

- Prove that decomposition of acetaldehyde is three-halves order.
- Discuss decomposition of acid-base catalysis.
- Deduce Bronsted-Bjerrum equation.
- Discuss thermodynamical formulation of reaction rate.

Q3. Answer the following (Any Two):

- Describe in detail the theory of homogeneous reactions.
- Discuss the kinetics of enzyme catalysis.
- Explain thermal reaction between hydrogen and bromine.
- Discuss transition state theory of reaction rate.

Q4. Answer the following:

- (a) Give an account of relaxation method for the determination of fast reactions.
- (b) Discuss the decomposition of ozone.
- (c) Explain different laws of photochemistry.

OR

- (a) Discuss the upper and lower explosion limits of a reaction between hydrogen and oxygen. Explain explosion limits.
- (b) Give an account of secondary salt effect.
- (c) Explain different types of actinometers.

Q5. Answer the following (Any Two):

- (a) Discuss the primary salt effect in detail.
 - (b) Define chain reaction. What are the characteristics of chain reactions.
 - (c) Discuss the reaction mechanism of: (i) acid catalyzed hydrolysis of methyl acetate and (ii) reaction of acetone with iodine.
 - (d) Explain theory of heterogeneous catalysis in terms of Langmuir adsorption isotherm.
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