



BBD-003-1104010

Seat No. _____

M. Sc. (Sem. IV) Examination

July - 2021

Paper-404 : Physical Chemistry

(Reaction Dynamics & Mechanisms) (New Course)

Faculty Code : 003

Subject Code : 1104010

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) Total 10 questions and attend 5 only.
(2) All questions carry 14 marks.

- 1** Answer the following : **14**
- (a) Give an account of different types of acid base catalysis.
 - (b) Explain catalytic promoters.
 - (c) What are the advantages of flash photolysis ?
 - (d) Define, collision number, enzyme, chain reaction, photo sensitizer.
 - (e) Discuss decomposition of ozone.
 - (f) Differentiate enzyme catalysis and general catalysis.
 - (g) Explain mechanisms of the reaction between NO_2 and F_2 .
- 2** Answer the following : **14**
- (a) Explain catalytic coefficient.
 - (b) Discuss quenched flow method.
 - (c) Discuss the reaction between Co and Cl_2 to form phosgene.
 - (d) Define : Chain length, heterogenous catalysis, Inhibitors, Photons.
 - (e) Discuss about quantum yield.
 - (f) Give an account of mechanism of chain reaction.
 - (g) Discuss metallic mirror method.
- 3** Answer the following : **14**
- (a) Explain primary salt effect in detail.
 - (b) Explain classical collision theory.

- 4 Answer the following : 14
(a) Discuss the mechanism of acid-base catalysis.
(b) Which are the factors governing the rate of enzyme reaction.
- 5 Answer the following : 14
(a) Describe the characteristics of catalysis.
(b) Discuss thermodynamical formulation of reaction rate.
- 6 Answer the following : 14
(a) Discuss relaxation method for the determination of fast reactions.
(b) Discuss the characteristics of chain reaction.
- 7 Answer the following : 14
(a) Explain the theory of homogeneous reactions.
(b) Discuss the kinetics of enzyme catalysis.
- 8 Answer the following : 14
(a) Discuss the law of photochemistry.
(b) Discuss :
(i) The mechanisms of acid catalyzed hydrolysis of methyl acetate.
(ii) Auto oxidation.
- 9 Answer the following : 14
(a) Discuss the explosion limits between hydrogen and oxygen reaction.
(b) What is actinometer ? State the different types of actinometers in detail.
- 10 Answer the following : 14
(a) Discuss :
(i) Effect of pH on reaction rate for acid base catalyzed reaction.
(ii) Deduce Bronsted-Bierrm equation.
(b) Discuss :
(i) One half order kinetics of decomposition of acetaldehyde.
(ii) Ammonium cynate urea reaction.