Section B

6. (a) Explain the factors affecting electrolytic conduction of a solution. **3**

(b) Discuss the titration curve obtained in conductometric titration of HCl and NaOH solution. **3**

7. (a) Explain the type of curve obtained in the conductometric titration of : **3**

(i) $AgNO_3$ solution with KCl solution.

(ii) NH_4OH solution with HCl solution.

(b) With the help of the suitable example, explain how a buffer solution resists change in its pH. **3**

8. (a) How can the Debye-Huckel-Onsager equation be utilized for determining the equivalent conductance of strong electrolyte at infinite dilution law. **3**

(b) Calculate the degree of dissociation of acetic acid of conc. 0.1 M using Oswald's dilution Law. Given the dissociation constant of acetic acid $K_a = 1.8 \times 10^{-5}$ at 298 K. **3**

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B. Sc. EXAMINATION, 2026

(Second Semester)

(Re-appear Only)

CHEMISTRY

Paper–V (CH–105)

Physical Chemistry

Time : 3 *Hours*] [*Maximum Marks :* 32

Before answering the question-paper, candidates must ensure that they have been supplied with correct and complete question-paper. No complaint, in this regard will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *two* questions from each Section. Q. No. **1** is compulsory.

(Compulsory Question)

1. (a) Write the unit of rate constant of third order reaction. **1**

(b) Define equivalent conductivity. **1**

(c) Why does the pH of the buffer solution consisting of Ammonium hydroxide and Ammonium chloride not change when few drops of NaOH are added to it ? **2**

(d) Give an example of First order reaction. **1**

(e) Write an expression for half-life period of a second order reaction. **1**

(f) What is the relation between molar conductivity and equivalent conductivity ? **1**

(g) What is buffer action ? **1**

Section A

2. (a) Write an expression for the rate constant of third order reaction of the type $3A \rightarrow$ Product. **3**

(b) Expain how different factors affect the rate of any reaction. **3**

3. (a) Explain Transition State theory of bimolecular reactions. **3**

(b) The thermal decomposition of a compound follows first order kinetics. If 50% of the compound is decomposed in 120 minutes, how long will it take for 90% of the compound to decompose ? **3**

4. (a) Briefly describe Collision state theory of Unimolecular reactions. **3**

(b) The slope of Arrhenius plot is found to be –7610 K. Calculate the activation energy of the reaction. **3**

5. (a) What is a zero order reaction ? Examplify. Derive an expression for the rate constant and half life period of zero order reaction. **3**

(b) Discuss the advantages of transition state theory over collision theory. **3**

9. (a) What are the limitations of Arrhenius theory for ionization of electrolytes ? **3**

(b) State and explain the *three* applications of Kohlrausch law. **3**

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9. (a) What are the limitations of Arrhenius theory for ionization of electrolytes ? **3**

(b) State and explain the *three* applications of Kohlrausch law. **3**

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