21CHE1C3L

M.Sc. I Semester Degree Examination, April/May - 2023
CHEMISTRY
Kinetics and Electrochemistry
(CBCS)

Time : 3 Hours   Maximum Marks : 70

Note : *Answer* **any five** *of the following questions with Question No.* **1 (Q1) compulsory**, *each question carries* **equal** *marks.*

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1. (a) Explain Fugacity and Free energy.   **4+5+5**

(b) Deduce Gibbs-Duham equation.

(c) Discuss Maxwell's relations.

2. (a) Explain RRKM theory of reaction rates.   **4+5+5**

(b) Comment on substituent effects on the rates of reaction.

(c) What are branched reactions ? Explain its general rate expression.

3. (a) Explain effect of inhibitors and temperature on enzyme catalysed reaction.

(b) Derive Michaelis-Menten equation for enzyme catalysis.   **4+5+5**

(c) Deduce BET equation for multilayer adsorption.

4. (a) Discuss Faraday's laws of electrolysis.   **4+5+5**

(b) Explain Debye-Huckel limiting law.

(c) Give physical significance of κ (Cuppa).

5. (a) Explain factors effecting rate of corrosion.   **4+5+5**

(b) Explain : (i) Galvanization (ii) Corrosion in boiler

(c) Explain electrochemical theory of corrosion for iron metal.

6. (a) Describe Lindeman theory of reaction rates. **4+5+5**

(b) Write a note on effect of pH on reaction rates with graphical representation.

(c) Define activation energy ? Explain steady state approximation in reaction rates.

7. (a) Discuss types of corrosion with examples. **4+5+5**

(b) Write notes on :

(i) Electrochemical methods of corrosion protection.

(ii) Cathodic protection.

(c) Explain Ostwalds dilution law.

8. (a) Discuss industrial applications of catalysis. **4+5+5**

(b) Explain Hydrogen-halogen chain reaction.

(c) Discuss :

(i) Qualitative verification of Debye-Huckel equation

(ii) Hydrogen embritlement

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