21CHE2C7L

M.Sc. II Semester Degree Examination, Sept./Oct. - 2024
CHEMISTRY
Electro, Quantum and Photochemistry
(NEP)

Time : 3 Hours Maximum Marks : 70

Note : *Answer **any five** of the following questions with Question No. **1** is **Compulsory** and each question carries **equal** marks.*

1. (a) Explain Debye-Huckel limiting equation. **5+5+4=14**
  (b) Describe construction and working of H_2-O_2 fuel cell.
  (c) Discuss in details Gouy-Chapman electrical double layer.

2. (a) Describe Buttler-Volmer equation. **5+5+4=14**
  (b) Explain :
    (i) Ohmic over voltage
    (ii) Concentration over voltage
  (c) Write notes on :
    (i) Solubility Product
    (ii) Diffusion Current

3. (a) Explain Heisenberg Uncertainty Principle. **5+5+4=14**
  (b) Discuss Schrodinger wave equation for particle in one dimensional box.
  (c) Give postulates of Quantum mechanics.

4. (a) Discuss Jablonski diagram for photochemical reactions. **5+5+4=14**
  (b) Write a note on Quantum yield and its determination.
  (c) Discuss Laws of Photochemistry.

5. (a) Explain photochemical kinetics of formation of HCl. **5+5+4=14**
  (b) Write notes on :
    (i) Photo catalyst
    (ii) Photosensitization
  (c) Explain photocatalytic character of ZnO.

6. (a) Write notes on diffusion current and stationary current. **5+5+4=14**

(b) Discuss experimental determination of overvoltage.

(c) Discuss the concepts of operators and its types.

7. (a) Differentiate singlet and triplet states in photochemical reactions. **5+5+4=14**

(b) Explain the kinetics of formation of CH_3CHO.

(c) Explain photochemistry of Carbonyl Compounds.

8. (a) Derive Schrödinger's wave equation for particle in three dimensional box.

(b) Explain : **5+5+4=14**

(i) Ionic product of water

(ii) Activation over potential

(c) Discuss Frank-Condon Principle with diagram.

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