

B.Sc. Semester - 6 (CBCS) Examination
March/April-2023 (NEW COURSE)
Physical and Analytical Chemistry (Core (New))

Time: 2:30 Hours

Marks: 70

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

- Q.1(A) Answer the following question. (04)**
 Describe the tests of Third Law of Thermodynamics.
- Q.1(B) Answer the following questions. (Any Two) (10)**
1. Explain: Photochemical reaction of dimerization of anthracene with mechanism.
 2. Discuss the method of intercept for determining the partial molar properties.
 3. Find the ionic strength (μ) for 0.03 M BaCl_2 solution, if ionisation of BaCl_2 is 85 %.
- Q.2(A) Answer the following question. (04)**
 Explain: Charcoal cavity test with principle.
- Q.2(B) Answer the following questions. (Any Two) (10)**
1. Discuss: Argentometric titration of mixture of Cl^- , Br^- and I^- by AgNO_3 potentiometrically.
 2. Emf of following cell is 0.62 V. Find the Ionic product of (K_w) of water at 298 K.

$$\text{Pt}/\text{H}_{2(g)}1\text{ bar} / \text{KOH}(a=0.12) // \text{HCl}(a=0.01) / \text{H}_{2(g)}1\text{ bar} / \text{Pt}$$
 3. Derive the equation: $E_{w.o.t.} = \frac{RT}{F} \ln \frac{a_2}{a_1}$.
- Q.3(A) Answer the following question. (04)**
 Write a note on student T-test.
- Q.3(B) Answer the following questions. (Any Two) (10)**
1. Describe working method of Circular Paper Chromatography in detail.
 2. Discuss: Cation Exchange Resin in Ion-Exchange Chromatography.
 3. (i) Give any six applications of TLC.
 (ii) Define : (a) Stationary Phase (b) Chromatogram
- Q.4(A) Answer the following question. (04)**
 Describe the method of determination of activity co-efficient by solubility method.
- Q.4(B) Answer the following questions. (Any Two) (10)**
1. (i) Explain: Relation between activity & activity co-efficient.
 (ii) Discuss Henry's law with equation.
 2. (i) Explain determination of valency of metal ion by emf with suitable example.
 (ii) Define : (a) P^{H} metric titration (b) Sparingly Soluble Salt.
 3. Discuss the working method of Column Chromatography in detail.
- Q.5(A) Answer the following question. (04)**
 Write a note on Q-test in detail.
- Q.5(B) Answer the following questions. (Any Two) (10)**
1. Explain the determination of absolute entropy of solid by third law of thermodynamics.
 2. Discuss any three methods for minimization of error.
 3. (i) Explain: $\text{FeSO}_4 \rightarrow \text{KMnO}_4$ redox titration by potentiometry.
 (ii) Explain any one method of separation of Cl^- , Br^- and I^- ions in presence of each other in qualitative analysis.
