

B.Sc. Semester - 5 (CBCS) Examination

Oct/Nov.- 2024 (Old Course)

PHYSICAL AND ANALYTICAL CHEMISTRY (CORE)

Time: 2:30 Hours

Marks: 70

Instructions:

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

- Que.1(A) Answer the following question. (04)
Explain physical significance of Entropy in detail.
- Que.1(B) Answer any two questions out of three. (10)
 1. Explain Carnot Cycle in detail.
 2. Give limitations of first law of Thermodynamics and give any two statements of second law of Thermodynamics.
 3. Derive the equation to calculate Entropy change for reversible processes with change in pressure and temperature.
- Que.2(A) Answer the following question. (04)
Prove that the decrease in Gibb's free energy is equal to net-work.
- Que.2(B) Answer any two questions out of three. (10)
 1. Derive Clausius Clapeyron Equation.
 2. Discuss in brief the phase diagram of three pairs of partially miscible liquids in a Ternary System.
 3. Derive the Gibbs-Helmholtz Equation.
- Que.3(A) Answer the following question. (04)
Define:
(I) Transmittance (II) Optical Density (III) Absorbance.
- Que.3(B) Answer any two questions out of three. (10)
 1. Derive the mathematical expression of Lambert-Beer's Law.
 2. Explain Standard Hydrogen Electrode in detail.
 3. Explain Reversible and Irreversible Cell in detail.
- Que.4(A) Answer the following question. (04)
Explain the conductometric titration curve of CH_3COOH with NaOH .
- Que.4(B) Answer any two questions out of three. (10)
 1. Describe the replacement titration curve of CH_3COONa with HCl by Conductometry.
 2. Discuss the precipitation titration curve of BaCl_2 by K_2SO_4 by Conductometry.
 3. Give structure, characteristics and uses of Murexide Indicator.
- Que.5(A) Answer the following question. (04)
Define:
(I) Titration (II) Back Titration (III) End Point (IV) Equivalent Point
- Que.5(B) Answer any two questions out of three. (10)
 1. What is Primary Standard? List the characteristics of Primary Standards.
 2. Explain Volhard's method of precipitation titration in detail.
 3. Explain Neutralization Titration Curve of strong acid and strong base by Volumetric Method.
