

B.Sc. Semester - 6 (CBCS) Examination
March/April-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.

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- Q. 1 (A) Answer the following question. (04)**
(1) Discuss the tests of Third law of thermodynamics.
- Q. 1 (B) Answer any two questions out of three. (10)**
(1) Derive the equation : $a_2 = a_+^{v+} \cdot a_-^{v-}$
(2) Discuss the determination of absolute entropy of liquids and gases by Third law of Thermodynamics.
(3) Explain Solubility method for determination of activity co-efficient.
- Q. 2 (A) Answer the following question. (04)**
(1) Explain the determination of the valency of *Metal ion* by using emf.
- Q. 2 (B) Answer any two questions out of three. (10)**
(1) Discuss: Electrode Concentration Cell with example.
(2) Derive the equation: $E_{w.o.t.} = \frac{RT}{F} \ln \frac{a_2}{a_1}$.
(3) Write a note on Liquid Junction Potential.
- Q. 3 (A) Answer the following question. (04)**
(1) Write a note on Instrumental error and Methodic error.
- Q. 3 (B) Answer any two questions out of three. (10)**
(1) Derive Gibbs-Duhem equation.
(2) Explain the method of intercept for determination of Partial Molar Property.
(3) Explain Student T test in detail.
- Q. 4 (A) Answer the following question. (04)**
(1) Discuss principle & working method of Ion Exchange Chromatography.
- Q. 4 (B) Answer any two questions out of three. (10)**
(1) Write a note on selection of carrier gas in GLC.
(2) Describe general technique of Circular Paper Chromatography.
(3) Write a note on selection of adsorbent & uses of column chromatography.
- Q. 5 (A) Answer the following question. (04)**
(1) Write a note on Flame Test with principle.
- Q. 5 (B) Answer any two questions out of three. (10)**
(1) Explain: Separation of mixture of Cl^- , Br^- and I^- ions in detail.
(2) Explain: titration of mixture of Cl^- , Br^- and I^- by $AgNO_3$ potentiometrically.
(3) How the dissociation constant (K_a) of weak acid can be calculated using p^H metry ?
