647510 **BSCphyCC6030** **Seat No :_____**

B.Sc. Semester - 6 (*CBCS*) Examination
March/April-2023 (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.

Q.1(A) **Answer the following question.** **(04)**

Discuss Nernst heat theorem in detail.

Q.1(B) **Answer the following questions. (Any Two)** **(10)**

1. Discuss the emf method for the determination of activity co-efficient.

2. Derive the equation: $\log f_{\pm} = -AZ_{+}Z_{-}\sqrt{\mu}$.

3. **(i)** Explain empirical correction for Debye-Huckle Limiting Law.
(ii) Write a note on Residual entropy.

Q.2(A) **Answer the following question.** **(04)**

Derive the equation of emf for electrolyte concentration cell without transference.

Q.2(B) **Answer the following questions. (Any Two)** **(10)**

1. Write a note on Electrode Concentration Cell by giving suitable example.

2. Define: LJP & Explain methods of elimination of Liquid Junction Potential in detail.

3. Define: Concentration Cell & explain determination of the valency of metal ion by emf?

Q.3(A) **Answer the following question.** **(04)**

Explain Raoult's law with equation by using chemical Potential.

Q.3(B) **Answer the following questions. (Any Two)** **(10)**

1. Write a note on Student T-test.

2. Write a note on Indeterminate errors in detail.

3. Derive Gibbs-Duhem equation.

Q.4(A) **Answer the following question.** **(04)**

Write a note on Cation exchange resin in Ion-Exchange Chromatography.

Q.4(B) **Answer the following questions. (Any Two)** **(10)**

1. Explain working method of Circular Paper Chromatography in detail.

2. **(i)** Give any six uses of Column Chromatography.
(ii) Write a note on the selection of Carrier gas in Gas Chromatography.

3. **(i)** Define: **(a)** Mobile phase **(b)** Developer
(ii) Write any six uses of TLC.

Q.5(A) **Answer the following question.** **(04)**

Discuss in detail: Flame Test with principle.

Q.5(B) **Answer the following questions. (Any Two)** **(10)**

1. Explain: Separation of mixture of S^{-2}, SO_3^{-2} *and* $SO_4{}^{-2}$ ions in presence of each oth

2. How Dissociation constant (Ka) of weak acid can be calculated by P^H Metry ?

3. Explain the redox titration of $FeSO_4$ against $K_2Cr_2O_7$, potentiometrically**.**

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