

B.Sc. Semester - 6 (CBCS) Examination

April/May-2022 (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.

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- Q. 1 (a) Answer the following question. (4)**
(1) Calculate μ and $f_{\pm}$ for aqueous solution of $0.003\text{M Cu(NO}_3)_2$ at 25°C .
- Q. 1 (b) Answer any two questions out of three. (10)**
(1) Explain: Photochemical reaction of decomposition of HI with mechanism.
(2) Discuss the effect of temperature on Chemical Potential.
(3) Describe the tests of Third Law of Thermodynamics.
- Q. 2 (a) Answer the following question. (4)**
(1) Explain: Flame test with principle.
- Q. 2 (b) Answer any two questions out of three. (10)**
(1) Discuss: Titration of mixture of Cl^- , Br^- and I^- by AgNO_3 potentiometrically.
(2) Discuss the method of determination of Dissociation Constant (K_a) of weak acid by emf measurement.
(3) Derive the equation of emf for electrolyte concentration cell with transference.
- Q. 3 (a) Answer the following question. (4)**
(1) Write a note on Operative error and Instrumental error.
- Q. 3 (b) Answer any two questions out of three. (10)**
(1) Describe working method of Column Chromatography in detail.
(2) Discuss: Cation Exchange Resin in Ion-Exchange chromatography.
(3) The amount of element A in AB compound in different experiments obtained as 34.22%, 34.26%, 34.13%, 34.01% and 34.28%. Then, calculate Median value, Mean Value, Average deviation, Relative average deviation and Standard deviation.
- Q. 4 (a) Answer the following question. (4)**
(1) Discuss solubility method for the determination of activity co-efficient.
- Q. 4 (b) Answer any two questions out of three. (10)**
(1) Derive Gibbs Duhem Equation.
(2) Discuss the Separation of CO_3^{2-} , SO_3^{2-} and S^{2-} ions in presence of each other.
(3) Explain various methods of Preparation of plate, Spotting and Development of plate in TLC.
- Q. 5 (a) Answer the following question. (4)**
(1) Discuss: Superiority of TLC over other chromatographic techniques.
- Q. 5 (b) Answer any two questions out of three. (10)**
(1) Derive the equation of Debye-Huckel Limiting law.
(2) Explain: Method of determination of the P^H of unknown solution by using H_2 – electrode as an indicator electrode and Calomel electrode as a reference electrode.
(3) (a) Write a short note on Selection of Carrier gas in Gas chromatography.
(b) Write a note on Q-test.
