

B.Sc. Semester - 5 (Remedial) (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)

- (1) Write a note on entropy change in irreversible processes.

Q. 1 (b) Answer any two questions out of three. (10)

- (1) Explain: Carnot Cycle with operations in detail.
- (2) Derive the equation: $\Delta S_{mix} = -R \sum n_i \ln X_i$.
- (3) Discuss in detail entropy change in ideal gases.

Q. 2 (a) Answer the following question. (04)

- (1) Discuss the formation of one pair of partially miscible liquids in a ternary system.

Q. 2 (b) Answer any two questions out of three. (10)

- (1) Derive the Gibbs-Helmholtz equation.
- (2) Write a note on Free energy and its significance.
- (3) Derive Clausius-Clayperon equation for a phase in equilibrium.

Q. 3 (a) Answer the following question. (04)

- (1) Explain Silver-Silver chloride electrode in detail.

Q. 3 (b) Answer any two questions out of three. (10)

- (1) Discuss spectrophotometric titration when lack of absorbance by product and reagent.
- (2) Discuss: Reversible and Irreversible cell with suitable example.
- (3) Derive the mathematical expression of Lambert's law.

Q. 4 (a) Answer the following question. (04)

- (1) Discuss: Conductometric titration curve for strong acid with weak base.

Q. 4 (b) Answer any two questions out of three. (10)

- (1) Discuss: Replacement titration of salt of weak acid with strong acid by conductometry.
- (2) Explain: Principle of Metal ion indicators and give characteristics and uses of murexide indicator.
- (3) Discuss: Precipitation titration curve of BaCl_2 by K_2SO_4 by conductometry.

Q. 5 (a) Answer the following question. (04)

- (1) Discuss: Iodimetry titration with any one example.

Q. 5 (b) Answer any two questions out of three. (10)

- (1) Write a note on Volhard's method for precipitation titration.
- (2) Explain the principle of Ostwald's law based on indicator.
- (3) Explain: Neutralisation titration curve of polyprotic acid and strong base, volumetrically.
