

B.Sc. Semester - 5 (Remedial) (CBCS) Examination**March/April-2022 (NEW 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)

- (1) Give any four statements of second law of thermodynamics.

Que-1 (B) **Answer any two questions out of three.** (10)

- (1) Derive the equation, $\Delta G^0 = -RT \ln K_p$.
- (2) Explain Carnot Cycle with operations in detail.
- (3) Explain about entropy change in reversible processes.

Que-2 (A) **Answer the following question.** (04)

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

Que-2 (B) **Answer any two questions out of three.** (10)

- (1) Write Cell reactions and Nernst equation at 298 K temperature and 1 bar pressure for following cells.



- (2) Discuss the conductometric titration curve for weak acid with strong base.
- (3) Explain: Reversible and irreversible cell with suitable example.

Que-3 (A) **Answer the following question.** (04)

- (1) Derive the mathematical expression of Lambert's law.

Que-3 (B) **Answer any two questions out of three.** (10)

- (1) Discuss: Primary and secondary standard solutions.
- (2) Explain: Iodimetry titration with two examples.
- (3) Explain: Neutralisation titration curve of strong acid with weak base.

Que-4 (A) **Answer the following question.** (04)

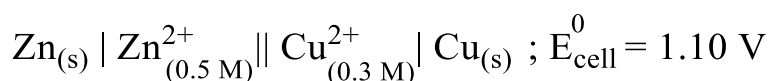
- (1) Derive Clausius-Clapeyron equation for a phase in equilibrium.

Que-4 (B) **Answer any two questions out of three.** (10)

- (1) Explain: Free energy and its significance.
- (2) Discuss the precipitation titration curve of NaCl with AgNO₃ by conductometry.
- (3) Explain the principle of metal ion indicator and write a note on Calcon indicator.

Que-5 (A) **Answer the following question.** (04)

- (1) Calculate free energy change of the reaction occurs in following cell at 298 K temperature.



Que-5 (B) **Answer any two questions out of three.** (10)

- (1) Define: Conductivity cell and discuss the effect of dilution on conductance, specific conductance and equivalent conductance.
- (2) Write a note on Mohr's method for precipitation titration.
- (3) Derive the equation of entropy change for mixing of ideal gases.
