

B.Sc. Semester - 5 (CBCS) Examination
Oct/Nov - 2025 (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.

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- Que.1(A) Answer the following question. (04)
(1) What is entropy? Explain entropy change in an irreversible process (spontaneous)
- Que.1(B) Answer the following questions. (Any two) (10)
(1) Calculate the entropy change involved in the isothermal reversible expansion of 5 moles of an ideal gas from a volume of 10 liters to a volume of 100 litres at 300 K. ($R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$)
(2) Derive van't Hoff Isochore equation.
(3) Explain Carnot's cycle with its operation in detail.
- Que.2(A) Answer the following question. (04)
(1) Write a note on standard cell.
- Que.2(B) Answer the following questions. (Any two) (10)
(1) Discuss the ternary system for two pair of partially miscible liquid with phase diagram.
(2) Give Conductometric Titration of mixture of strong acid and weak acid with strong base.
(3) Explain calomel electrode in detail.
- Que.3(A) Answer the following question. (04)
(1) Write a note on External redox indicator.
- Que.3(B) Answer the following questions. (Any two) (10)
(1) Explain neutralization titration of strong base and weak acid with diagram.
(2) Explain Instrumentation (Radiation source, Filter, Slit, Cell, and Detectors name) in colorimetry analysis.
(3) What is precipitation titration? Explain Mohar's method.
- Que.4(A) Answer the following question. (04)
(1) Explain work function: its physical significance and variation with V and T.
- Que.4(B) Answer the following questions. (Any two) (10)
(1) Explain entropy change in physical transformation with related equation.
(2) Write a note on: a) conductivity water, b) cell constant
(3) Discuss Iodimetry titration with suitable example.
- Que.5(A) Answer the following question. (04)
(1) Explain the Terms: Conductance, Specific resistance, Specific conductance, Equivalent conductance.
- Que.5(B) Answer the following questions. (Any two) (10)
(1) Derive Clausius Clapeyron equation and its integration form.
(2) Explain Reversible cell and Irreversible cell.
(3) Explain internal redox indicator.
