

Seat No.	
----------	--

B.Sc. (Part - III) (Semester - V) (CBCS)**Examination, October - 2023****CHEMISTRY****Physical Chemistry (Paper - XI)****Sub. Code : 79684****Day and Date : Friday, 27 - 10 - 2023****Total Marks : 40****Time : 10.30 a.m. to 12.30 p.m.**

- Instructions :**
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Draw neat labelled diagrams and give equations wherever necessary.
 - 4) Use of scientific calculator and logarithmic table is allowed.

Q1) A) Answer the following in one sentence only. **[4]**

- i) Define single electrode potential.
- ii) Define Rayleigh or elastic Scattering.
- iii) Define critical solution temperature or CST.
- iv) Define the Quantum yield (ϕ).

B) Select the most correct alternative from the following. **[4]**

- i) In Concentration cells, emf is produced due to decrease in _____ accompanying the cell reaction.
 - a) enthalpy
 - b) free energy
 - c) entropy
 - d) kinetic energy
- ii) When the temperature coefficient of the cell becomes zero, the free energy change of the cell reaction is equal to _____.
 - a) zero
 - b) enthalpy change
 - c) entropy change
 - d) internal energy

P.T.O.

iii) de-Broglie equation is given as _____.

- | | |
|-----------------------|----------------------|
| a) $E = hv$ | b) $\lambda = h / c$ |
| c) $\lambda = h / mv$ | d) $\lambda = h / m$ |

iv) Homogenous mixture of two or more chemical components is known as _____.

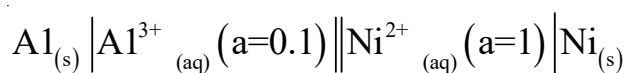
- | | |
|-------------|--------------------|
| a) solution | b) solute |
| c) solvent | d) dilute solution |

Q2) Attempt any Two of the following. [20]

- Derive an expression for emf of an electrolyte concentration cell without transference.
- What are ideal solutions? Draw liquid-vapor composition curves for an ideal solution. Show with the help of this diagram that vapour is always richer in more volatile component.
- Discuss in detail Jablonski diagram.

Q3) Attempt any three of the following. [12]

- Explain metal - metal ion electrode.
- Calculate the emf of the cell at 298K,



$$E^{\circ}_{Al^{3+}/Al} = -1.66V, E^{\circ}_{Ni^{2+}/Ni} = -0.236V$$

- Explain the factors affecting quantum yield.
- State and explain Raoult's law.
- Discuss Nicotine water system.

