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B.Sc. (Part - III) (Semester - V) (CBCS) Examination, October - 2023 CHEMISTRY Physical Chemistry (Paner - XI)

Physical Chemistry (Paper - XI) Sub. Code: 79684						
Day and Date : Friday, 27 - 10 - 2023 Time : 10.30 a.m. to 12.30 p.m.						: 40
Instruction		1) 2) 3) 4)	All questions are compu Figures to the right indi	cate full marks. rams and give e	quations wherever necess mic table is allowed.	sary.
Q1) A)	An	swer	the following in one se	ntence only.		[4]
	i)	Define single electrode potential.				
	ii) Define Rayleigh or elastic Scattering.					
	iii)	Define critical solution temperature or CST.				
	iv)	De	fine the Quantum yield	(\emptyset) .		
B) Select the most correct alternative from the following. [4]						
	i)	In Concentration cells, emf is produced due to decrease inaccompanying the cell reaction.				
		a)	enthalpy	b)	free energy	
		c)	entropy	d)	kinetic energy	
					490	
	ii) When the temperature coefficient of the cell becomes zero, the free energy change of the cell reaction is equal to					e free
		a)	zero	b)	enthalpy change	
		c)	entropy change	d)	internal energy	
					1	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.
- b) 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.
- c) Discuss in detail Jablonski diagram
- Q3) Attempt any three of the following.

[12]

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

$$A1_{(s)}\left|A1^{^{3+}}\right|_{(aq)}\!\left(a\!\!=\!\!0.1\right)\!\left\|Ni^{^{2+}}\right|_{(aq)}\!\left(a\!\!=\!\!1\right)\!\left|Ni_{(s)}\right|$$

$$E^{\circ}_{A1\ 3+|A1} = -1.66V, \ E^{\circ}_{Ni2+/Ni} = -0.236V$$

- c) Explain the factours affecting on quantum yield.
- d) State and explain Raoult's law.
- e) Discuss Nicotine water system.

