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School of Chemical & Life Sciences
M.Sc. Chemistry/Semester I
Paper Code: MCHCC--101
Paper Title: Physical Chemistry-I

Time 2.5 hours

Maximum Marks 60

Abbreviations Used: CLO- Course Outcome, PLO- Program Outcome, BTL- Bloom Taxonomy Level: BT level 1-Remember; BT level 2-Understand; BT level 3-Apply; BT level 4-Analyse; BT level 5-Evaluate, BT level 6-Create.

Section A

Very Short Type Questions (Attempt all questions)

(10x2=20Marks)

Q. No	Question	Marks	BTL	CLO	PLO
1.	What is the half-wave potential ($E_{1/2}$)?	2	1	1	1
2.	What are phase & component of Phase diagram?	2	2	2	1
3.	Define is quantum mechanics?	2	2	3	1
4.	Define degree of freedom?	2	2	4	1
5.	What is polarography?	2	1	4	1
6.	What is fuel cell?	2	2	4	1
7.	What is Fugacity?	2	2	2	1
8.	What is ECG?	2	2	3	1
9.	What is sorption?	2	2	3	1
10.	What are operators?	2	2	4	1

Section B

Long Type question (Attempt any two out four)

(10x2=20)

Q. No	Question	Marks	BTL	CLO	PLO
1.	What is the role of the Debye-Hückel theory in the electrochemistry of solutions?	10	6	1	3
2.	Derive Butler Volmer equation.	10	5	2	3
3.	Derive an expression for Energy and position of particles in one dimensional box.	10	5	2	3
4.	Explain Ten postulates of Quantum mechanics.	10	6	3	3

PTO

Section C**Short Type questions. (Attempt all questions)****(5x5=25)**

Q.NO	Questions	Marks	BTL	CLO	PLO
1.	Derive BET adsorption isotherm equation? OR What are nanocatalysts, and how do they differ from traditional catalysts?	4	3	1	2
2.	Find out the commutator between position & momentum? OR Derive the expression of Normalised ψ for particle in one dimensional box.	4	4	2	2
3	How is the composition of each phase represented in a ternary phase diagram? OR How is the excess volume related to the ideal solution behaviour?	4	3	3	2
4	What is the role of the Stern layer in the electrochemical double layer model? OR What are the different regions of a polarographic curve?	4	3	4	2
5	What is the relationship between electrokinetic effects and surface tension of surface films? OR What is the significance of the Kelvin equation for the vapor pressure of small droplets?	4	4	4	2

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