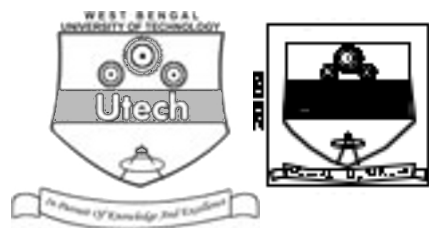


EQUILIBRIUM & NON-EQUILIBRIUM ELECTROCHEMISTRY (SEMESTER - 4)

CS/INT.PBIR(CH)/SEM-4/CH-522/09



1.
Signature of Invigilator

2.
Signature of the Officer-in-Charge

Reg. No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Roll No. of the Candidate

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

CS/INT.PBIR(CH)/SEM-4/CH-522/09

ENGINEERING & MANAGEMENT EXAMINATIONS, MAY – 2009

EQUILIBRIUM & NON-EQUILIBRIUM ELECTROCHEMISTRY (SEMESTER - 4)

Time : 3 Hours]

[Full Marks : 50

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. You have to answer the questions in the space provided marked 'Answer Sheet'. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification.**
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

Question Number											Total Marks	Examiner's Signature
Marks Obtained												

.....
Head-Examiner / Co-Ordinator / Scrutineer

31007 (20/05)



DO NOT WRITE ON THIS PAGE



ENGINEERING & MANAGEMENT EXAMINATIONS, MAY – 2009
EQUILIBRIUM & NON-EQUILIBRIUM ELECTROCHEMISTRY
SEMESTER – 4



Time : 3 Hours]

[Full Marks : 50

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer any *ten* of the following.

1. Distinguish between polarisable and non-polarisable electrode-electrolyte interfaces.
What is meant by equivalent electrical circuit of an interface ? 5
2. Why does the interfacial tension at an electrode-electrolyte interface change with potential ? What is the significance of the rate of change ? 5
3. 'Stem model is a synthesis of Helmholtz-Perrin and Guoy-Chapman models.' Discuss. 5
4. What are the factors that control the extent of contact absorption ? Explain why usually large negative ions are contact absorbed. 5
5. 'Conductance minimum is an evidence of ion-association beyond pairing.' Discuss. 5
6. Show that the free energy of ion-solvent interaction, as obtained from Born model, is negative. 5
7. What is the essential difference between structural and non-structural models of ion-solvation ? Distinguish between primary and secondary solvation regions. 5



8. 'Wien effect is an evidence of the existence of ion-atmosphere.' Explain. 5
9. What is meant by the statement that an electrode is polarised? What is limiting current? On which factors does it depend? 5
10. Show that the Nernst equation can be obtained by considering the kinetics of electrochemical reactions. 5
11. 'Though the net current flowing through a piece of corroding metal is zero, it is not under equilibrium.' Explain. 5
12. Define half-wave potential. Show how this can be used to find out the composition of the complex formed by a metal ion with a ligand (No derivation is required, but mention the necessary experimental condition). 5

END