

REG.No.



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)
COIMBATORE-641 035



B.E/B.Tech- INTERNAL ASSESSMENT – I

Department of Chemistry

Academic year 2023-24 (ODD)/FIRST SEMESTER

23CHT101 – Engineering Chemistry

(Common to CSE, ECE, IT & AIML)

(REGULATION 2023)

B

TIME:1.5 HOURS

MAXIMUM MARKS:50

ANSWER ALL QUESTIONS

PART A— (5 x 2 = 10Marks)

		CO	BL	
1.	From the following standard potentials, arrange the metals in the order of their increasing order of reduction potential. i) $Zn^{2+}(aq) + 2e^- \rightarrow Zn(s)$: $E^\circ = -0.76 V$ ii) $Fe^{2+}(aq) + 2e^- \rightarrow Fe(s)$: $E^\circ = -0.40 V$ iii) $Mg^{2+}(aq) + 2e^- \rightarrow Mg(s)$: $E^\circ = -2.36 V$ iv) $Ni^{2+}(aq) + 2e^- \rightarrow Ni(s)$: $E^\circ = -0.25 V$ v) $Ni(s) \rightarrow Ni^{2+}(aq) + 2e^-$: $E^\circ = +0.25 V$	CO1	App	2
2.	Suggest two reasons why hydrogen electrode not used commonly like a calomel reference electrode?	CO1	Un	2
3.	Find the EMF for $Fe^{2+}/Fe // Cu^{2+}/Cu$ the cell (E° of $Fe^{2+}/Fe = -0.40 V$ and $Cu^{2+}/Cu = +0.34V$)	CO1	App	2
4.	How the cell potential is related to Free energy change, what are the important requirement of a battery.	CO2	Un	2
5.	Differentiate the reversible and irreversible cell. Give an example for each	CO2	Un	2

PART B —(13 + 13 +14= 40 Marks)

6.	(a)	The standard reduction potential of the electrode in the following reaction is $-0.76V$ at room temperature, $Zn^{2+} + 2e^- \rightarrow Zn$, and the concentration of Zn^{2+} ions is $0.015M$. Derive the Nernst equation for the above reaction and calculate its Electrode potential.	CO1	App	13
(OR)					
	(b)	Construct the glass electrode and mention its advantages, disadvantages and Applications. How pH is found using a glass electrode by combining with Calomel electrode with proper labeled diagram	CO1	App	13

7.	(a)	What type of cell is lead-acid battery? Construct a Lead acid battery with Neat and labeled digram, explain it working with discharging and charging chemical reactions and Mention its few applications	CO2	Un	13	
(OR)						
	(b)	Classify the types of Batteries with examples and explain in detail about the construction and working of a Primary battery and mention its few advantages and applications	CO2	Un	13	
8.	(a)	(i)	What do you understand by electrochemical series, how does it help to calculate the Standard emf E° of Electrochemical Cell, in predicting whether a redox reaction is feasible in a given direction or not and whether a given metal will displace another from its salt solution?	CO2	App	7
		(ii)	Define EMF of a cell and determine the electromotive force of electrochemical cell by applying the principle of poggendroff's compensation technique.	CO2	App	7
(OR)						
	(b)	(i)	Construct the calomel electrode and describe its working and determine the electrode potential of Zn by using calomel electrode	CO3	App	7
		(ii)	Construct the Daniel cell, Write its cell reaction, cell representation and represent the salt bridge in it and its functions and calculate the cell potential of the Daniel cell.	CO3	App	7

**Blooms Taxonomy Abbreviations: Rem-Remembrance, Und-Understanding,
App- Apply, Ana-Analyze, Eva-Evaluate, Cre-Create**
