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**B.Tech. Degree I Semester Regular/Supplementary Examination in
Marine Engineering November 2022**

**19-208-0103 ENGINEERING CHEMISTRY
(2019 Scheme)**

Time: 3 Hours

Maximum Marks: 60

Course Outcome

On successful completion of the course, the students will be able to:

- CO1: To Understand the treatment of water to remove hardness.
 CO2: To get exposure to the important aspects of solid state chemistry and electrochemistry.
 CO3: To Understand and apply the concepts corrosion science.
 CO4: To get exposure on the important types of fuels used in marine applications.
 CO5: To gain sound understanding on the requirements and properties of a few important engineering materials.

Bloom's Taxonomy Levels (BL): L1 – Remember, L2 – Understand, L3 – Apply, L4 –Analyze, L5 – Evaluate, L6 – Create

PO – Programme Outcome

		(5 × 15 = 75)	Marks	BL	CO	PO
I.	(a) Describe the various steps involved in the treatment of sewage water.		10	L3	1	1.2.1
	(b) 100 ml of a water sample required 20 ml of 0.01M EDTA for titration with EBT indicator. 100 ml of the same water sample after boiling and filtering required 10 ml of 0.01 M EDTA. Calculate the total, carbonate and non-carbonate hardness of the sample.		5	L4	1	1.2.1
OR						
II.	(a) With the help of a neat diagram, explain the electro dialysis method for desalination of brackish water.		10	L3	1	1.2.1
	(b) What are the causes of air pollution? Describe any three methods to prevent air pollution.		5	L2	1	1.2.1
III.	(a) Explain the Poggendorff compensation method of determination of emf.		5	L3	2	1.2.1
	(b) Derive Nernst's equation for single electrode potential. A hydrogen electrode at 25°C is immersed in a solution of P ^H 2.5 and coupled with SHE. Calculate the emf of the cell.		10	L4	2	1.2.1
OR						
IV.	(a) Discuss the non stoichiometric defects in crystals.		8	L2	2	1.2.1
	(b) Explain the construction and working of liquid crystal display.		7	L3	2	1.2.1
V.	(a) Explain the theory of electrochemical corrosion of metals taking iron as example.		8	L3	3	1.2.1
	(b) Discuss the methods of metallic coating for corrosion control.		7	L2	3	1.2.1
OR						
VI.	(a) What are the important ingredients in paints? Give their functions.		10	L2	3	1.2.1
	(b) What are the important factors affecting corrosion?		5	L3	3	1.2.1

(P.T.O.)

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		Marks	BL	CO	PO
VII.	(a) How can the calorific value of a solid fuel be determined experimentally?	10	L3	4	1.2.1
	(b) Write notes on:	5	L3	4	1.2.1
	(i) Octane number				
	(ii) Cetane number.				
OR					
VIII.	(a) Explain the working of solar cells.	10	L3	4	1.2.1
	(b) Write notes on:	5	L3	4	1.2.1
	(i) nuclear fission				
	(ii) Fuel cells.				
IX.	(a) Discuss different moulding techniques of polymers.	9	L3	5	1.2.1
	(b) Describe the preparation, properties and uses of	6	L3	5	1.2.1
	(i) silicone rubber				
	(ii) polyurethane.				
OR					
X.	(a) Describe the preparation, properties and uses of any three synthetic rubbers.	10	L3	5	1.2.1
	(b) What are Nylons? How are they prepared? What are their uses?	5	L3	5	1.2.1

Bloom's Taxonomy Levels

L2 - 20%, L3 - 70%, L4 - 10%.
