Code No: 182AH **R22**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech I Year II Semester Examinations, September - 2023
ENGINEERING CHEMISTRY
(Common to CE, ME, ECE, EIE, AE, BT, MIE, PCE, CSE(AI&ML), CSE(IOT), AI&DS, AI&ML)

Time: 3 Hours **Max. Marks: 60**

Note: This question paper contains two parts A and B.
i) **Part- A** for 10 marks, ii) **Part - B** for 50 marks.
- Part-A is a compulsory question which consists of ten sub-questions from all units carrying equal marks.
- Part-B consists of **ten questions** (numbered from 2 to 11) **carrying 10 marks each**. From each unit, there are two questions and the student should answer one of them. Hence, the student should answer five questions from Part-B.

PART – A

(10 Marks)

1.a)	How can we recover exhausted ion exchange resins?	[1]
b)	What is Calgon Conditioning?	[1]
c)	Explain water line Corrosion.	[1]
d)	Give the electrode reaction of Zn -Air Battery.	[1]
e)	Define Biodegradable polymers and give one example.	[1]
f)	What is the basic unit of natural rubber?	[1]
g)	Define HCV and LCV.	[1]
h)	Explain transesterification.	[1]
i)	What are shape memory materials?	[1]
j)	Discuss flash point and fire point.	[1]

PART – B

(50 Marks)

2.a) What is the principle of EDTA method? Explain the estimation of hardness of water by complexometric Method.
b) Explain the process of Reverse Osmosis. [7+3]

OR

3.a) Give a detailed account on:
i) Sales & sludges ii) Caustic embrittlement
b) Explain in detail break point chlorination. [4+6]

4.a) Explain in detail the classification of batteries and give suitable examples.
b) What are fuel cells? Differentiate fuel cells with batteries and explain in detail the Construction and applications of solid oxide fuel cells. [4+6]

OR

5.a) Explain electrochemical corrosion and discuss the mechanism of rust formation in acidic and Neutral medium.
b) Explain sacrificial anodic method of corrosion control with a neat diagram and give its applications. [6+4]

6.a) Explain the difference between thermo-set and thermoplastic resins with example.
b) Explain preparation and, properties and applications of the following:
(i) PVC (ii) Bakelite [4+6]

OR

7. What are conducting polymers? Explain the mechanism in of Conduction in trans polyacetylene and give application of conducting polymers. [10]

8.a) Give an account on analyzing a coal sample by ultimate analysis and give its significance.
b) Write short note on CNG and LPG give its applications. [6+4]

OR

9.a) Write an account on refining of petroleum by explaining the composition, boiling range and uses of different fractions obtained during refining.
b) Differentiate octane number and cetane number. [7+3]

10. Explain the setting hardening of cement with relevant chemical reactions involved in it. [10]

OR

11. Discuss the important properties of Lubricating oils useful for their evaluation. [10]

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