

**R22**

Code No: 182AH

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**

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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]

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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]

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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]

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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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