| Code No.: R25CH101BS | R25 | H.T.No. | | | 8 | R | | | | | | |
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**CMR ENGINEERING COLLEGE: : HYDERABAD**
**UGC AUTONOMOUS**
**I–B.TECH–I–Semester End Examinations (Regular) - December - 2025**
**ENGINEERING CHEMISTRY**
**(CSE)**

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

**Note:** This question paper contains two parts A and B.
Part A is compulsory which carries 10 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

**PART-A** **(10 Marks)**

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|---|---|---|---|
| 1. | a) | Define hardness of water and its classification. | [2M] |
| | b) | List any four Characteristics of a good fuel. | [2M] |
| | c) | What is Cathodic protection? Name two methods used for it. | [2M] |
| | d) | Write any two applications of Conducting polymers. | [2M] |
| | e) | Write any two applications of Quartz in engineering. | [2M] |

**PART-B** **(50 Marks)**

| | | |
|---|---|---|
| 2. | Explain the Ion-exchange process for softening of water. Compare it with Reverse Osmosis for desalination of brackish water. | [10M] |
| | **OR** | |
| 3. | Explain the estimation of hardness of water by Complexometric (EDTA) titration method. | [10M] |
| 4. | Explain the construction, working, and applications of a Direct Methanol Fuel Cell (DMFC) with a neat labeled diagram. Discuss its advantages and limitations. | [10M] |
| | **OR** | |
| 5. | Explain Fischer tropsch's process for synthesis of petrol with neat diagram. | [10M] |
| 6. | Explain the Electrochemical theory of corrosion with a neat diagram. | [10M] |
| | **OR** | |
| 7. | Describe the construction, working, and applications of the Calomel electrode. How is it used as a reference electrode in the determination of pH of an unknown solution? | [10M] |
| 8. | Explain the preparation and applications of PVC, Nylon-6, 6 and Buna-S rubber. | [10M] |
| | **OR** | |
| 9. | Explain the classification of Conducting polymers. Describe the mechanism of conduction in trans-polyacetylene with a neat diagram. | [10M] |
| 10. | Describe UV-Visible spectroscopy and its use in the analysis of pollutants in the dye industry. | [10M] |
| | **OR** | |
| 11. | Explain the classification of Smart Materials with suitable examples. | [10M] |

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