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Course Code: AHSD03



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

**B.TECH I SEMESTER CIE – I EXAMINATIONS, NOVEMBER – 2023**

Regulation: BT23

## ENGINEERING CHEMISTRY

(COMMON TO CSE | CSE(DS) | CSE(CS))

Max Marks: 20

Time: 2 Hours

Answer any **FOUR** questions

All parts of the question must be answered in one place only

1. (a) What is oxidation corrosion and how does it takes place? Describe the mechanism of oxidation corrosion. [BL: Understand| CO: 1|Marks: 2]  
(b) Differentiate between electrolytic cell and electrochemical cell. Explain the construction of electrolytic cell with chemical reactions. [BL: Understand| CO: 1|Marks: 3]
2. (a) Write about cathodic metal coating. Describe tinning process of protecting iron sheet from corrosion and mention its applications. [BL: Understand| CO: 1|Marks: 2]  
(b) Describe the construction and working of lead-acid battery. Write the discharging, charging reactions and mention its applications and limitations. [BL: Understand| CO: 1|Marks: 3]
3. (a) Explain the principle and experimental procedure for the determination of total hardness by EDTA method. [BL: Understand| CO: 2|Marks: 2]  
(b) Determine temporary and permanent hardness of a water sample in ppm which contains 6.8mg of  $\text{CaSO}_4$ , 33mg of  $\text{CaCl}_2$ , 40mg of  $\text{MgCl}_2$ , 24mg of  $\text{MgSO}_4$  per liter of the water sample. (Given Molar mass of Ca=40g, Mg=24g, S=32g, O=16g, Cl=35g). [BL: Understand| CO: 2|Marks: 3]
4. (a) What is sterilization of water? How is natural water sterilized by chlorine, bleaching powder, chloramines? [BL: Understand| CO: 2|Marks: 2]  
(b) A sample water of 100 ml required 12.6 ml of 0.02M EDTA solution with EBT as indicator and 8.4 ml of 0.02 M EDTA for the same volume of water after removing the carbonate hardness. Determine the total, permanent hardness in terms of calcium carbonate equivalents. [BL: Apply| CO: 2|Marks: 3]
5. (a) Differentiate between
  - i) Addition and condensation polymerization. [BL: Understand| CO: 3|Marks: 2]
  - ii) Thermoplastic and thermosetting plastics  
(b) Discuss about polymers. Explain the synthesis, properties and applications of phenol-formaldehyde and polyvinyl chloride. [BL: Understand| CO: 3|Marks: 3]

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