INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

B.Tech I Semester End Examinations (Supplementary) - January/February, 2018
Regulation: IARE – R16
ENGINEERING CHEMISTRY
(Common for all branches)

Time: 3 Hours   **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Define the terms specific, equivalent and molar conductance and explain effect of dilution on them. **[7M]**

   (b) Discuss the construction of $Zn - MnO_2$ battery with relevant reactions occurring during discharge. **[7M]**

2. (a) What is single electrode potential? Derive Nernst equation for single electrode potential. **[7M]**

   (b) Describe the construction and working of lead-acid battery with the reactions occurring during discharge. **[7M]**

UNIT – II

3. (a) What is oxidation corrosion and how it takes place? Describe the mechanism of oxidation corrosion. **[7M]**

   (b) Explain the process of Galvanization with a neat diagram and mention its applications. **[7M]**

4. (a) What is paint? Explain the constituents and function of paint. **[7M]**

   (b) Name and explain the corrosion control method if Mg block are used to protect the corrosion of underground pipeline. **[7M]**

UNIT – III

5. (a) What is EDTA? Explain the determination of total hardness using EDTA method **[7M]**

   (b) 100 ml of hard water sample required 22.5 ml of M/100 EDTA solution at the end point using EBT as indicator. The same volume of water after boiling and filtering, the filtered water required 14.5 ml of the same EDTA at the end point with the same indicator. Calculate the total, permanent, and temporary hardness of water. **[7M]**

6. (a) Discuss the principle and the process involved in the purification of water by reverse osmosis method. **[7M]**

   (b) What is the difference between hard water and soft water? Mention the salts responsible for permanent and temporary hardness. **[7M]**

UNIT – IV

7. (a) Write the synthesis, properties and applications of PVC and Teflon. **[7M]**

    (b) Define the term vulcanization of rubber. Mention its significance. **[7M]**

8. (a) Write the preparation and properties of the following **[7M]**
       i) Nylon 6,6   ii) Bakellite

    (b) Discuss the synthesis and applications of Buna-S. **[7M]**

UNIT – V

9. (a) Describe the fractional distillation of petroleum wit a neat diagram. **[7M]**

    (b) Write a short note a **[7M]**
       i) Knocking   ii) Octane number   iii) Cetane number

10. (a) What is cracking? Discuss the fixed bed catalytic cracking method to obtain gasoline. **[7M]**

    (b) Describe about proximate and ultimate analysis of coal and mention its significance. **[7M]**

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