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Question Paper Code: AHS005



**INSTITUTE OF AERONAUTICAL ENGINEERING**  
(Autonomous)

B.Tech I/II Semester Supplementary Examinations - July, 2017

Regulation: IA-R16

**ENGINEERING CHEMISTRY**  
[Common for : I Semester (all branches)]

Time: 3 Hours

Max Marks: 70

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

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**UNIT – I**

1. (a) What are reference electrodes? Describe the construction and working of Calomel electrode. [6M]  
(b) Define the terms specific, equivalent and molar conductance and explain effect of dilution on them. [8M]
2. (a) What is single electrode potential? Derive Nernst equation for single electrode potential. [6M]  
(b) Describe the construction and working of lead-acid battery with the reactions occurring during discharge. [8M]

**UNIT – II**

3. (a) Discuss the mechanism of wet corrosion. [7M]  
(b) Explain the anodic metal coating with example. Mention its advantage. [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 meant by reverse osmosis? Explain the desalination of sea water by reverse osmosis method. [7M]  
(b) 0.28 g of  $CaCO_3$  was dissolved in 1 liter of water. 100 ml of this water on titration required 28 ml of EDTA solution. 100 ml of an unknown hard water sample required 33 ml of same EDTA solution. After boiling and filtering 100 ml of the same unknown sample required 10 ml of the same EDTA solution. Calculate total and permanent hardness of water sample. [7M]
6. (a) How do you estimate dissolved oxygen in water? [6M]  
(b) What is potable water? What are the steps taken to obtain pure drinking water? [8M]

#### UNIT – IV

7. (a) i. Write a detailed note on compounding of plastics. [8M]  
ii. What are the important functions of lubricant?
- (b) What are the draw backs of natural rubber? Explain the vulcanization process. [6M]
8. (a) What are fibers? Write a note on natural fibers and their modification. [7M]  
(b) i. Distinguish between thermo and thermosetting plastics. [7M]  
ii. Give reason: PVC is soft and flexible, where as Bakelite is hard and brittle.

#### UNIT – V

9. (a) What is cracking of petrol? Explain fixed bed catalytic cracking process. [7M]  
(b) What is calorific value? Explain octane and cetane numbers. [7M]
10. (a) A sample of coal has 5% hydrogen when allowed to undergo combustion. The following data: weight of coal = 0.95 g, weight of water = 700 g, water equivalent weight = 2000 g, rise in temperature =  $2.4^{\circ}C$ . Calculate GCV and NCV of sample. Latent heat of steam = 2454 kJ/kg, specific heat =  $4.2 \text{ kJ/kg/}^{\circ}C$  [7M]  
(b) What is knocking? Explain the mechanism of knocking with relevant equations. [7M]