



**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

Siddharth Nagar, Narayanavanam Road, Puttur – 517583

**QUESTION BANK**

**Subject with Code :** Engineering Chemistry (20HS0804)    **Course & Branch:** B.Tech - ME

**Year & Sem:** I-B.Tech & I SEM

**Regulation :** R20

**UNIT-1**

**WATER TECHNOLOGY**

1. Describe the estimation of hardness by EDTA method . [L3][CO1][12M]
2. a) What is priming and foaming ? [L1][CO1] [6M]  
b) Explain the process of scale and sludge formation in boilers. [L2][CO1] [6M]
- 3 a) How water gets hardness. Distinguish between hard water and soft water? [L4][CO1] [4M]  
b) Explain in detail about Boiler corrosion. [L2][CO1] [8M]
- 4 a) What are the specifications of the drinking water BIS and WHO Standards. [L1][CO1] [6M]  
b) What are the units to express hardness of water? [L1][CO1] [6M]
5. Briefly explain about the boiler troubles and their treatment? [L2][CO1] [12M]
6. Describe the Zeolite or permutit process for softening of water. what are the advantages and disadvantages of zeolite process. [L3][CO1] [12M]
7. Describe the Ion exchange process for demineralization of water ?what are the advantages and disadvantages of ion exchange process ? [L3][CO1] [12M]
8. a) Explain about demineralization of brackish water by Reverse Osmosis . [L2][CO1] [6M]  
b) Explain about demineralization of brackish water by Electrodialysis. [L2][CO1] [6M]
9. How do you estimate dissolved oxygen in water is determined by Winkler's method. [L4][CO1] [12M]
10. Explain with a neat sketch the various steps involved in municipal solid waste water Treatment . [L2][CO1] [12M]

## UNIT-II

### ELECTROCHEMISTRY AND APPLICATIONS

1. a) What is Electrochemical cell ? Give an example. [L1][CO2] [7M]  
 b) Calculate the single electrode potential of zinc in 0.05M ZnSO<sub>4</sub> solution at 25<sup>0</sup>C.  
 $E^0_{Zn/Zn^{2+}} = 0.763V.$  [L3][CO2] [5M]
2. Define Electrode Potential. Derive the Nernst equation for a single electrode potential and write its applications. [L1][CO2][12M]
3. a)What is primary Battery ? Write a note on Zinc-air battery . [L1][CO2] [6M]  
 b) Explain the Construction and working of Lead acid battery. [L2][CO2] [6M]
4. a)What is secondary Battery ? Write a note on Lithium Ion rechargeable cell. [L1][CO2] [6M]  
 b) Describe the Construction and Working of Methanol – Oxygen Fuel cell. [L3][CO2] [6M]
5. What is a Fuel cell ? Describe the Construction and Working of Hydrogen – Oxygen Fuel Cell. [L3][CO2][12M]
6. Discuss in detail about electrochemical or wet corrosion? [L3] [CO2][12M]
7. Define corrosion? Discuss in detail about chemical or dry corrosion . [L3][CO2] [12M]
8. a)Write a note on sacrificial anodic protection? [L1][CO2] [6M]  
 b) Define the importance of the Impressed Current Cathodic protection ? [L1][CO2] [6M]
9. a) What is electroplating ? Explain electroplating of Nickel and copper ? [L2][CO2] [6M]  
 b) What is Differential Aeration cell corrosion ? Give the suitable Examples. [L1][CO2] [6M]
10. Explain various factors influencing the rate of corrosion ? [L3][CO2] [12M]

**UNIT-III**

**POLYMERS AND FUEL CHEMISTRY**

- |   |                 |
|---|-----------------|
| 1. a) What is functionality of monomer?   | [L1][CO3] [5M]  |
| b) Write a note on nomenclature of polymers.  | [L1][CO3] [7M]  |
| 2. What is polymerization ? Explain different types of polymerization with examples.  | [L1][CO3] [12M] |
| 3. Explain the mechanism of addition polymerization.  | [L2][CO3] [12M] |
| 4. Write the preparation, properties and application of Buna-S rubber ,<br>Buna-N rubber and Thikol rubber.   | [L2][CO3] [12M] |
| 5. a) Distinguish between Thermoplastics and thermosetting plastics.  | [L4][CO3] [4M]  |
| b) Describe the preparation, properties and uses of Bakelite.and PVC  | [L3][CO3] [8M]  |
| 6. a) what are the fuels? Give their classification with examples. write their units.   | [L1][CO3] [8M]  |
| b) Calculate the gross and net calorific values of coal having the following<br>composition , Carbon = 85% ,Hydrogen = 8% ,Sulphur = 1% , nitrogen= 2%<br>Ash= 4 % , Latent heat of steam = 587 cal/gm. | [L3][CO3] [4M]  |
| 7. Explain the analysis of Coal (Proximate and Ultimate) With its Significance.   | [L2][CO3] [12M] |
| 8. Describe the method employed for the refining of petroleum with neat sketch  | [L3][CO3] [12M] |
| 9. a)What are significance of the Fuels for IC Engines  | [L1][CO3] [6M]  |
| b) Write a note on Octane value and Cetane value  | [L1][CO3] [6M]  |
| 10. a)What is the essential of propane and methanol fuel.   | [L1][CO3] [6M]  |
| b) What is the importance of the Ethanol and Bio fuel ?   | [L1][CO3] [6M]  |

**UNIT –IV**  
**BASIC ENGINEERING MATERIALS**

1. What is meant by composites ? Classify the composites materials. [L1][CO4] [12M]
2. What are Refractories ? Write their Classification. .Discuss in detailed about properties of Refractories.[L1][CO4] [12M]
3. Define Viscosity? Determine the viscosity of lubricating oil by Redwood Viscometer . [L2][CO4] [12M]
4. Write short notes on:
  - a) Flash and Fire point [L1][CO4] [6M]
  - b) Cloud and Pour point [L1][CO4] [6M]
5. Discuss the mechanism of different types of lubrication. [L3][CO4] [12M]
6. What is meant by lubricant ? Give the classification and examples of the lubricants ? [L1][CO4] [12M]
7. Define Cement . Explain in detailed about manufacture of Portland Cement? [L2][CO4] [12M]
8. a) What is cement ? How do you classify the cement ? [L1][CO4] [6M]  
b) Explain in detail about setting and hardening of portland cement? [L2][CO4] [6M]
9. What are the applications of Composite materials ? [L1][CO4] [12M]
10. a) Write a note on Fiber reinforced materials. [L1][CO4] [7M]  
b) What are the properties of composite material [L1][CO4] [5M]

**UNIT –V****SURFACE CHEMISTRY AND APPLICATIONS**

1. Write any two methods synthesis of colloids with suitable examples. [L1][CO5] [12M]
2. Write a note on any one chemical and electrochemical methods of preparation of nano metals [L1][CO5] [12M]
3. a) Write an account on carbon nano tubes. [L1][CO5] [6M]  
b) Write a note on fullerenes. [L1][CO5] [6M]
4. a) What is colloid? Classify the colloids based on the physical state. [L1][CO5] [6M]  
b) Write a note on Micelle formation [L1][CO5] [6M]
5. Explain principle, instrumentation and applications of Scanning Electron microscopy (SEM) [L2][CO5] [12M]
6. Discuss the principle, instrumentation and applications of Transmission electron microscopy (TEM) [L3][CO5] [12M]
7. Explain principle, instrumentation and applications X-ray diffraction [L2][CO5] [12M]
8. a) Explain the BET Equation [L2][CO5] [6M]  
b) What are the factors influencing Adsorption of gases on solids [L1][CO5] [6M]
9. Write a brief note on Applications of Colloids and Nano materials. [L1][CO5] [12M]
10. What are the Characterization of surface by Physicochemical method? [L1][CO5] [12M]