



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

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QUESTION BANK

Subject with Code : Engineering Chemistry (19HS0802)**Course & Branch:**B.Tech (CE,ME& AGE)

Year & Sem: I-B.Tech & II-Sem

Regulation : R19

UNIT-1

WATER TECHNOLOGY

1. 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]
2. Describe the estimation of hardness by EDTA method. [L6][CO1] [12M]
3. a) How water gets hardness. Distinguish between hard water and soft water? [L1,L4][CO1] [4M]
b) Explain in detail about Boiler corrosion. [L2][CO1] [8M]
4. a) Explain the importance of priming and foaming? [L2][CO1] [6M]
b) Explain sludge and Scale formation in boilers? [L2][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. [L6][CO1] [12M]
7. Describe the Ion exchange process for demineralization of water? what are the advantages and disadvantages of ion exchange process? [L6][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. Explain in detail about the Industrial water treatment. [L5][CO1] [12M]
10. Explain with a neat sketch the various steps involved in municipal solid waste water Treatment. [L5][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 ZnSO₄ solution at 25⁰C.

$$E^0_{Zn/Zn^{2+}} = 0.763V.$$
 [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 Li battery (Primary Cell) . [L1][CO2] [5M]
 b) Explain the Construction and working of Lead acid battery. [L2][CO2] [7M]
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. [L6][CO2] [6M]
5. What is a Fuel cell ? Describe the Construction and Working of Hydrogen – Oxygen Fuel Cell. [L1][CO2][12M]
6. Discuss in detail about electrochemical or wet corrosion? [L6] [12M]
7. Define corrosion ? Discuss in detail about chemical or dry corrosion . [L1][CO2] [12M]
8. a)Write a note on sacrificial anodic protection? [L2][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 ? [L1,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 ? [L2][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. [L2][CO3] [7M]
2. Explain the following mechanism
a) Free radical addition polymerization. [L2][CO3] [6M]
b) Cationic addition polymerization. [L2][CO3] [6M]
3. Explain the following mechanism
a) Anionic addition polymerization. [L2][CO3] [6M]
b) Co-ordination or Ziegler-Natta polymerization. [L2][CO3] [6M]
4. Write the preparation, properties and application of Buna-S rubber ,
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 [L6][CO3] [8M]
6. a) what are the fuels, the classification and examples of the fuels. ? write their units. [L1][CO3] [8M]
b) Calculate the gross and net calorific values of coal having the following
composition , Carbon = 85% ,Hydrogen = 8% ,Sulphur = 1% , nitrogen= 2%
Ash= 4 % , Latent heat of steam = 587 cal/gm. [L6][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 [L6][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 [L2][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 ? How are they Classified .Discuss in detailed about properties of Refractories. [L1][CO4] [12M]
3. Define Viscosity? Determine the viscosity of lubricating oil by Redwood Viscometer . [L1,L5][CO4] [12M]
4. Write short notes on:
 - a) Flash and Fire point [L2][CO4] [6M]
 - b) Cloud and Pour point [L2][CO4] [6M]
5. Discuss the mechanism of different types of lubrication. [L6][CO4] [12M]
6. Define the lubricants give the classification and examples of the lubricants ? [L1][CO4] [12M]
7. Define Cement .Explain in detailed about manufacture of Portland Cement? [L1,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. [L2][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. [L2][CO5] [12M]
2. What is the significance of the adsorption isotherm [L1][CO5] [12M]
3. Explain various methods of stabilization of colloids. [L5][CO5] [12M]
4. a) What is colloid ? Classify the colloids based on the physical state. [L1][CO5] [6M]
b) Write a note on Micelle formation [L2][CO5] [6M]
5. Explain principle, instrumentation and applications of Scanning Electron microscopy (SEM) [L5][CO5] [12M]
6. Discuss the principle, instrumentation and applications of Transmission electron microscopy(TEM) [L6][CO5] [12M]
7. Explain principle, instrumentation and applications X-ray diffraction [L5][CO5] [12M]
8. a) Explain the BET Equation [L2][CO5] [7M]
b) What are the factors influencing Adsorption of gases on solids [L1][CO5] [5M]
9. Write a brief note on Applications of Colloids and Nano materials. [L2][CO5] [12M]
10. What are the Characterization of surface by Physicochemical method ? [L1][CO5] [12M]