

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

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**QUESTIONBANK (DESCRIPTIVE)**

**Subject with Code: ENGINEERINGCHEMISTRY (20HS0804) Course & Branch: B.Tech: ME, CIVIL & AGE**

**Year & Sem : I YEAR&I SEM**

**Regulation:R20**

**UNIT-I  
WATER TECHNOLOGY**

1	a) What is meant by hardness?	[L1][CO1]	[2M]
	b) Describe the estimation of hardness by EDTA method.	[L3][CO1]	[10M]
2	a) Define hardness. Distinguish between hard water and soft water?	[L3][CO1]	[4M]
	c) How do you estimate dissolved oxygen in water by Winkler's method	[L4][CO1]	[8M]
3	a) Explain about the priming and foaming?	[L2][CO1]	[6M]
	b) Explain the process of scale and sludge formation in boilers.	[L2][CO1]	[6M]
4	a) Explain in detail about the Boiler corrosion.	[L2][CO1]	[6M]
	b) What are the specifications of the drinking water BIS and WHO Standards?	[L1][CO1]	[6M]
5	Explain with a neat sketch the various steps involved in Municipal Water Treatment	[L2][CO1]	[12M]
6	a) What is the chemical formula of zeolite?	[L1][CO1]	[2M]
	b) Describe the Zeolite or Permutit process for softening of water. What are the Advantages and disadvantages of zeolite process.	[L3][CO1]	[10M]
7	Briefly explain about any three boiler troubles and their treatment	[L2][CO1]	[12M]
8	a) Describe the Ion exchange process for demineralization of water?	[L3][CO1]	[8M]
	b) What are the advantages and disadvantages of Ion exchange process?	[L1][CO1]	[4M]
9	a) Explain about demineralization of brackish water by Reverse Osmosis.	[L2][CO1]	[6M]
	b) Explain about desalination of brackish water by Electrodialysis.	[L2][CO1]	[6M]
10	Write short notes on: i) What are the units to express hardness? ii) Write the specifications of Potable water.	[L1][CO1] [L1][CO1]	[6M] [4M]

## UNIT-II

## ELECTROCHEMISTRY AND APPLICATIONS

1	a) What is Electrochemical cell? Explain the construction & working principle of Electrochemical cell with neat diagram.	[L1][CO2]	[8M]
	b) Calculate the single electrode potential of zinc in 0.05M ZnSO <sub>4</sub> solution at 25°C. $E^0_{Zn/Zn^{2+}} = -0.763V$ .	[L3][CO2]	[4M]
2	a) Define Electrode Potential.	[L1][CO2]	[2M]
	b) Derive the Nernst equation for a single electrode potential and write its applications.	[L2][CO2]	[10M]
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	a) What is a Fuel cell?	[L1][CO2]	[2M]
	b) Describe the Construction and Working of Hydrogen– Oxygen Fuel Cell	[L3][CO2]	[10M]
6	Explain the process of wet corrosion by a) Evolution of Hydrogen and b) Absorption of Oxygen	[L3][CO2]	[6M]
		[L3][CO2]	[6M]
7	a) Define corrosion?	[L3][CO2]	[2M]
	b) Give an account of oxidation corrosion with relevant chemical equation involved.	[L3][CO2]	[10M]
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	a) What is polymerization?	[L1][CO3]	[2M]
	b) Explain the different types of polymerization with examples.	[L1][CO3]	[10M]
3	Explain the following mechanism of Addition polymerization.		
	a) Free-radical addition polymerization	[L2][CO3]	[6M]
	b) Cationic addition polymerization	[L2][CO3]	[6M]
4	a) Distinguish between Thermoplastics and Thermosetting plastics.	[L4][CO3]	[6M]
	b) Describe the preparation, properties and uses of Bakelite.	[L3][CO3]	[6M]
5	Write the preparation, properties and applications of the following polymers		
	a) Buna-S rubber .,	[L2] [CO3]	[4M]
	b) Buna-N rubber .	[L2] [CO3]	[4M]
	c) Thikol rubber.	[L2] [CO3]	[4M]
6	Explain the following mechanism of Addition polymerization.	[L2][CO3]	[6M]
	a) Anionic addition polymerization		
	b) Zeigler-Natta addition polymerization	[L2][CO3]	[6M]
7	a) Explain the Proximate analysis of coal with its significance.	[L2][CO3]	[6M]
	b) Discuss the ultimate analysis of coal with its significance.	[L2][CO3]	[6M]
8	a) Define refining of petroleum.	[L3][CO3]	[2M]
	b) Describe the fractional distillation of petroleum.	[L3][CO3]	[10M]
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 significance of propane and methanol fuels.	[L1][CO3]	[6M]
	b) What is the importance of the Ethanol and Biofuel?	[L1][CO3]	[6M]

**UNIT-IV**  
**BASIC ENGINEERING MATERIALS**

1	a) Define composites?	[L1][CO4]	[2M]
	b) Classify the composites materials.	[L1][CO4]	[10M]
2	a) Define Refractories? Give the classification of refractories with examples.	[L1][CO4]	[6M]
	b) Write short note on the following properties of refractories. (i) Refractoriness (ii) Refractoriness Under Load (iii) Thermal Spalling	[L1][CO4]	[6M]
3	a) Define Viscosity?	[L2][CO4]	[2M]
	b) Determine the viscosity of lubricating oil by Redwood Viscometer.	[L2][CO4]	[10M]
4	Write short notes on: a) Flash and Fire point	[L1][CO4]	[6M]
	b) Cloud and Pour point	[L1][CO4]	[6M]
5	Write short note on following mechanism. a) Hydrodynamic Lubrication b) Thick Film Lubrication	[L1][CO4] [L1][CO4]	[6M] [6M]
6	Define 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) Write a brief note on applications of composite materials.	[L1][CO4]	[5M]

**UNIT-V**  
**SURFACE CHEMISTRY AND APPLICATIONS**

1	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]
2	Write a short note on the synthesis of colloids.	[L1][CO5]	[6M]
	a) Condensation Method		
	b) Dispersion Method	[L1][CO5]	[6M]
3	Give an account of chemical and electrochemical methods of preparation of nanometals.	[L1][CO5]	[12M]
4	a) Write an account on carbon nanotubes.	[L1][CO5]	[6M]
	b) Write a note on fullerenes.	[L1][CO5]	[6M]
5	a) Explain about the stabilization of colloids by Solid-Gas Interface.	[L2][CO5]	[6M]
	b) Write the applications of Nanomaterials?	[L1][CO5]	[6M]
6	Explain principle, instrumentation and applications of Scanning Electron microscopy (SEM).	[L2][CO5]	[12M]
7	Discuss the principle, instrumentation and applications of Transmission electron microscopy (TEM).	[L3][CO5]	[12M]
8	Explain principle, instrumentation and applications X-ray diffraction.	[L2][CO5]	[12M]
9	a) Explain the BET Equation	[L2][CO5]	[6M]
	b) Write the characteristics of colloids.	[L1][CO5]	[6M]
10	a) Write the applications of Colloids.	[L1][CO5]	[6M]
	b) Explain about the stabilization of colloids by Solid-Liquid Interface.	[L2][CO5]	[6M]

**PREPARED BY: CHEMISTRY DEPARTMENT**