

**UNIT - 1****L-9**

**WATER TECHNOLOGY:** Introduction, WHO, BIS standards of water, Hardness of water, Determination of hardness by EDTA (Numerical Problems), Disadvantages of hard water, Scales and sludges, Caustic embrittlement, Boiler corrosion, Priming and foaming, Softening methods - Zeolite process, Ion Exchange process; Desalination of brackish water - Reverse osmosis, Electrodialysis.

**UNIT - 2****L-9**

**ELECTRO CHEMISTRY:** Electrode potential, Electrochemical series, Nernst equation, Reference electrodes, Calomel and standard hydrogen electrode, Ion selective electrode, Glass electrode, Determination of pH using glass electrode; Primary cell, Secondary cell - Lead-acid storage cell, Lithium ion battery; Fuel cells - Hydrogen oxygen, Methanol oxygen.

**UNIT - 3****L-9**

**SCIENCE OF CORROSION:** Introduction, Dry corrosion, Wet corrosion, Mechanisms of wet corrosion, Bimetallic corrosion, Concentration cell corrosion, Factors influencing the rate of corrosion; Corrosion control methods - Cathodic protection, Electroplating, Electrolessplating, Corrosion inhibitors.

**UNIT - 4****L-9**

**POLYMERS:** Introduction, Types of polymerization - Preparation, Properties and applications of polyethylene, PVC, Teflon, Bakelite, Urea formaldehyde, Silicones; Rubber, Vulcanization, Synthetic rubbers - Buna-S, Buna-N, Neoprene; Introduction to conducting polymers; Poly thiophene.

**UNIT - 5****L-9**

**INSTRUMENTAL TECHNIQUES:** Interaction of radiation with matter, UV-Visible spectroscopy - Beer, Lambert's law, Qualitative and quantitative analysis, Block diagram of UV-Visible spectrophotometer, IR spectroscopy - Types of vibrations, Block diagram of IR spectrophotometer.

**TEXT BOOKS:**

1. P.C Jain and Monica Jain, "Engineering Chemistry", 17<sup>th</sup> edition, Dhanpat Rai Publications, 2010.
2. Shashi Chavala, "A Text book of Engineering Chemistry Engineering Materials and Applications", 3<sup>rd</sup> edition, Dhanpat Rai Publications, 2015.

**REFERENCE BOOKS:**

1. K.S. Maheswaramma and Mridula chugh, "Engineering Chemistry", 1<sup>st</sup> edition, Pearson publication, 2015.