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Water treatment: Introduction, Hardness of water, Disadvantages of hard water, Water-softening-Lime-Soda process, Ion-exchanger polished water, Boiled-feed water, boiler problems-scale, sludge priming and foaming, caustic embrittlement and corrosion.

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Fuels: Classification of fuels, Calorific values, Comparison between solid, liquid and gaseous fuels, Bomb calorimeter, Calorific value of gaseous fuel, Theoretical calculation of calorific value of a fuel, Wood, Coal, Analysis of coal, Natural Gas, Producer gas, water gas, Non-Conventional sources of energy.

Spectroscopic Techniques: Basic principles of spectroscopic methods. The use The use of various spectroscopic techniques for the determination of structure of simple compounds. XRD, SEM and TEM.

Polymers: Basic concepts & Terminology, such as monomers, Polymers, functionality, Thermoplastics, Thermosets, Linear, Branched, cross linked polymers etc. Different definitions of molecular weight's viz. Mw, Mn, Mv and then determinations, Industrial applications of polymers. General methods of synthesis of organics and their applications.

Nano Technology: Introduction, Properties, Synthesis and characterization of Nanomaterials, Material selfassembly, Nanoscale materials and their applications.

Biochemistry: Molecular basis of life, study of macro molecules: Carbohydrates, Proteins, Lipids, Nucleic acid. Metabolism, basic concepts and design, Glycolysis citric acid cycle oxidative phosphorylation pentose phosphate pathway...

- 1. Engineering Chemistry (16th Edition) by Jain, Jain, Dhanpat Rai Publishing Company, 2013
- Textbook of Engineering Chemistry by Jaya Shree Anireddy, Wiley, 2017.
- 3. Engineering Chemistry by E.R. Nagarajan and S. Ramalingam, Wiley, 2017.

Approved by AC sub-committee: 22/11/2021

Approved by BoS of USICT:31/10/2021,

Applicable from Batch Admitted in Academic Session 2021-22 Onwards

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4. Biochemistry by Lubert Stryer, Jeremy Berg, John Tymoczko, Gregory Gatto 9th Edition 2019. W H Freeman & Co.

Toranin Chamdra