

# Syllabus for Entrance Examination - M. Tech. in Dyestuff Technology

2024-25

## Organic Chemistry

- ❖ Basic Chemistry: Chemical bonding, mole concept, Theory of acid and bases.
- ❖ Basic reactions in organic chemistry: Oxidation, Reduction, Halogenations, Dehydration, Dehydrohalogenation, Condensation reaction, Free radical reaction, Catalytic reduction, Esterification, Polymerization, Hydrolysis.
- ❖ Name reactions in organic chemistry: Friedel-Crafts, Fries, Perkin, Sandmeyer, Mannich, Knoevenagel, Aldol, Michael, Stobbe, Grignard, Cannizzaro reaction.
- ❖ Heterocyclic chemistry: Three, four, five membered heterocycles, Synthesis, applications.

## Dyestuff Chemistry

- ❖ Introduction and classification of colorants – Acid dyes, direct dyes, basic dyes, vat dyes, disperse dyes, reactive dyes, azoic, sulphur dyes.
- ❖ Basic dyes: Diphenyl and triphenylmethane dyes, oxazines, diazines, thiazines.
- ❖ Application of dyes in traditional and hi-technological field.

## Analytical Chemistry

- ❖ Titrations: Acid-base titrations, iodimetric titration, iodometric titrations, Nitrite titration,  $TiCl_3$  titration.
- ❖ Spectroscopy: FTIR, Mass spectrometry, Nuclear Magnetic Resonance, Fluorescence spectroscopy
- ❖ Chromatography: Gas chromatography, High pressure liquid chromatography, Thin layer chromatography, Ion exchange chromatography.
- ❖ Normality, molarity, molality etc.

## Chemical Engineering

- ❖ Unit operations, Purification techniques, distillation, drying, evaporation, extraction, fluid storage, heat exchange, membrane separation, mixing, size reduction, solid handling, solid-solid separation, micro reactors etc.
- ❖ Various engineering/ safety factors
- ❖ Material of construction: Various Forms of Corrosion For Metals, Corrosion Rate, Coatings And Linings, Coatings And Linings, Choice of Material of Construction, Choice of Process Conditions

## Fiber-Polymer chemistry

- Natural fibers: cellulose, wool, silk, etc.
- Synthetic fibers: polyester, nylon, cellulose acetate,
- Dye-fiber interaction for various types of dyes and fibers.