
CHEMICAL ENGINEERING & POLYMER ENGINEERING**Total Marks: 100****UNIT-I : Physical Chemistry and Organic Chemistry:-****20 marks**

Atomic weight, Equivalent weight of elements, Definitions and determination of Equivalent weights, Concepts of Enthalpy, Enthalpy of reactions, formation. Solution, combustion, neutralization and Phase changes, Law of conservation of energy, Hess's law of Heat summation, Chemical Equilibrium, Constant, Free energy change, Standard free energies, Avogadro's number, Chemical Kinetics, and Molecularity of reactions, Electrochemistry- Acid and Bases and their properties.

Aliphatic hydrocarbons, Saturated and Unsaturated, Properties, preparation and uses of Methane, Ethane, Ethylene, Acetylene, Homolog series, Isomerism, Chain position, Functional, CIS and IUPAC system and System of naming Organic compounds, Hydrocarbons, Petroleum refining and Cracking.

UNIT-2 : Unit operations - I :-**20 Marks**

Purposes of agitation, Impellers, Propellers, Paddles, Turbines, Swirling and Vortex formation and their prevention, Mixing Equipments, Principles of Conveying, Types of Conveyors, Conveyor Accessories, Fields of applications. Size reduction- Principles and applications, Crushers- Jaw crusher, Grinders- Ball mill, Ultrafine grinders, Hammer mill, Fluid energy mill. Concepts of fluids,

Dimensions and units, Basic principles of fluid state, Viscosity, Application of manometry, Newtonian and Non-Newtonian fluids, Flow of fluids- Laminar and Turbulent flow- Reynold's experiment and Reynold's number, Flow measuring devices, Bernoulli's theorem and applications, Fluid flow machineries, Valves, Centrifugal and reciprocating pumps and their characteristics

UNIT-3: Chemical Process Calculations:-**20 marks**

Units and Dimensions, Fundamental quantities and derived units, merits of SI system of units, conversion of units, Basic concepts of chemical calculations- gram atom, gram mole, Use of molar units, Methods of expression of composition of solids, liquid and solutions- Weight percent, Volume percent, Mole fraction, Mole percent, Equivalent weights, Normality, Molarity, Molality, Material balance- Steady state material balance equations, material balance calculations without chemical reactions.

UNIT-4: Chemical & polymer technology, Instrumentation:**20 marks**

Manufacture of Definition of polymer – Classification reactions involved in the formation of polymers – Methods of polymerization – Manufacture of poly ethylene by Ziegler process – Manufacture of polyvinylchloride - phenol formaldehyde - Polystyrene - Polyester –Natural rubber, manufacture of synthetic rubber.(SBR)

Process variables, Static and dynamic characteristics of process instruments, measurement of temperature, pressure, level, density, humidity and pH.

UNIT-5: Unit operations - II:-**20 Marks**

Heat transfer – Conduction, Convection, Radiation, Surface co-efficient and overall co-efficient, Natural and Forced convection, Heat transfer to Boiling liquids, Condensation, Heat transfer equipments - Evaporators.

Drying- Definition of terms- equilibrium moisture, Bound moisture, Unbound moisture, Free moisture, Drying equipments.