Syllabus

Unit-I

Flow of Fluids: Types of manometers, reynolds number and its significance, bernoulli's theorem and its applications, energy losses, orifice meter, venturimeter, pitot tube and rotometer.

Size Reduction: Objectives, mechanisms and laws governing size reduction, factors affecting size reduction, principles, construction, working, uses, merits and demerits of hammer mill, ball mill, fluid energy mill, edge runner mill and end runner mill.

Size Separation: Objectives, applications and mechanism of size separation, official standards of powders, sieves, size separation principles, construction, working, uses, merits and demerits of sieve shaker, cyclone separator, air separator, bag filter and elutriation tank.

Unit-II

Heat Transfer: Objectives, applications and heat transfer mechanisms. Fourier's law, heat transfer by conduction, convection and radiation. Heat interchangers and heat exchangers.

Evaporation: Objectives, applications, and factors influencing evaporation, differences between evaporation, and other heat processes. Principles, construction, working, uses, merits, and demerits of steam jacketed kettle, horizontal tube evaporator, climbing film evaporator, forced circulation evaporator, multiple-effect evaporator and economy of the multiple-effect evaporator.

Distillation: Basic principles and methodology of simple distillation, flash distillation, fractional distillation, distillation under reduced pressure, steam distillation and molecular distillation.

Unit-III

Drying: Objectives, applications and mechanism of drying process, measurements and applications of equilibrium moisture content, rate of drying curve. Principles, construction, working, uses, merits and demerits of tray dryer, drum dryer spray dryer, fluidized bed dryer, vacuum dryer, freeze dryer.

Mixing: Objectives, applications and factors affecting mixing, difference between solid and liquid mixing, mechanism of solid mixing, liquids mixing, and semisolids mixing. Principles, construction, working, uses, merits, and demerits of double cone blender, twin shell blender, ribbon blender, sigma blade mixer, planetary mixers, propellers, turbines, paddles and silverson emulsifier.

Unit-IV

Filtration: Objectives, applications, theories and factors influencing filtration, filter aids, filter medias. Principle, construction, working, uses, merits and demerits of plate and frame filter, filter leaf, rotary drum filter, meta filter and cartridge filter, membrane filters and seidtz filter.

Centrifugation: Objectives, principle and applications of centrifugation, principles, construction, working, uses, merits and demerits of perforated basket centrifuge, non-perforated basket centrifuge, semi-continuous centrifuge and super centrifuge.

Unit-V

Materials of Pharmaceutical Plant Construction, Corrosion and its Prevention: Factors affecting during materials selected for pharmaceutical plant construction, theories of corrosion, types of corrosion and there prevention. Ferrous and nonferrous metals, inorganic and organic non-metals, basic of material handling systems.

Contents