

Syllabus for P G Entrance Examination of M.Sc. Sugar Technology 2018-19

Thermal Properties of Matter: Temperature & Heat, Measurement of Temperature, Ideal Gas equation and absolute temperature, thermal expansion, Specific Heat, Calorimetry, Change of state – melting point, boiling point, vaporisation, sublimation, Latent Heat. Heat Transfer, conduction – thermal conductivity, Convection, Radiation.

Properties of Fluids: Pressure – Pascal's Law, Variation of Pressure with depth, atmospheric pressure, gauge pressure, flow of fluid - Bernoulli's Principle, Viscosity, Reynold's Number.

Properties of Gases: Gaseous state, gas laws – Boyle's Law, Charle's Law, Gay Lussac's Law, Avogadro Law. Ideal Gas Equation, Dalton's Law of Partial Pressure, Kinetic Theory of Gases.

Solutions: Types, expressing concentration of solutions – Mass % (w/w), Volume % (v/v), mass by volume (w/v), parts per million (ppm), mole fraction. Solubility of solid in liquid – effect of temperature & pressure. Solubility of gas in liquid – Henry's law. Vapour pressure of liquid solutions – Raoult's law, elevation of boiling point, osmosis & reverse osmosis.

Colloids: Definition, classification – Lyophilic & Lyophobic colloids, charge on colloidal particles, zeta potential, electrophoresis, coagulation or precipitation of colloids.

Electrochemistry: Electrolytes & non-electrolytes, Electrolysis - Faraday's laws of electrolysis, Behaviour of electrolytes in solution – Arrhenius theory. Conductivity of electrolytes - strong electrolytes, weak electrolytes. pH – definition & pH scale, importance of pH in chemical and biological processes.

Corrosion: Electrochemical series, types of corrosion – Chemical or Dry corrosion – mechanism of oxide formation. Electrochemical or wet corrosion – atmospheric corrosion, Corrosion Prevention.

Carbohydrates: Classification, Monosaccharides – Glucose & Fructose, Structure & properties. Disaccharides – sucrose, maltose, lactose, structure & properties of sucrose, Polysaccharides – Starch, cellulose, glycogen.

Amino Acids: Definition & classification, examples of aliphatic, aromatic and heterocyclic amino acids, amino acids as dipolar ions, isoelectric point.

Proteins: Definition, classification – Fibrous proteins & globular proteins. Simple proteins – albumins, Conjugated proteins & derived proteins. Properties – amphoteric nature, precipitation & denaturation.

Crystallography: Crystal size & shape, elements of symmetry, space lattice, crystal systems, Miller's Indices, Types of crystals – Ionic crystals, polar molecular crystals & non-polar molecular crystals.
