

FPYC-302 FLUID MECHANICS AND PROPERTIES OF MATTER

UNIT-I

Hydrostatics: Fluids, hydrostatic pressure, Pascal's law, principle of Archimedes, equilibrium of floating bodies, stability of equilibrium, determination of metacentric height, pressure due to a compressible fluid or gas, measurement of atmospheric pressure, correction of Barometer reading. (6)

UNIT-II

Flow of liquid and viscosity: Rate of flow of a liquid, energy of the liquid, Bernoulli's theorem and its applications, critical velocity, Poiseuille's equation for flow of liquid through a tube, Motion in a viscous medium, determination of coefficient of liquid, Stoke's method, variation of viscosity of a liquid with temperature. (7)

Unit-III

Surface tension: Molecular range, Sphere of influence, surface tension, surface film and surface energy, free energy of a surface, pressure difference across a liquid surface, Drops and Bubbles: excess pressure inside a liquid drop, excess pressure inside a soap bubble, determination of the surface tension of a bubble.(5)

UNIT-IV

Capillarity: Layer of liquid between two plates, Shape of liquid meniscus in a capillary tube, Angle of contact, measurement of angle of contact, rise of liquid in a capillary tube, energy required to raise a liquid in a capillary tube, raise of liquid between two parallel plates. (5)

Properties of matter: Stress and strain, Hook's law, three types of elasticity, Poisson's ratio, effect of a suddenly applied load, twisting couple on a cylinder, alternative expression for strain energy in terms of stress, Torsional pendulum, determination of moment of inertia with the help of a Torsional pendulum, bending of Beams, Bending moment, cantilever, transverse vibration of a loaded cantilever, Searle's method for comparison of young's modulus and coefficient of rigidity in a given material.(7)

REFERENCE:-

1. Properties of matter -F.H. Newman V.H.L. Searle (Edward Arnold publication)
2. Properties of matter -D.S. Mathura(S.chand)
3. Mechanics -K.R. Symon(Addision Wesley)
4. Mechanics -D.S. Mathur(S.chand)