

CC- I : PROPERTIES OF MATTER AND ACOUSTICS

UNIT –I : Elasticity :

Stress – strain diagram – Elastic Moduli, Work done per unit volume in shearing strain – Relation between elastic constants – Poisson's Ratio – Expression for Poisson's ratio in terms of elastic constants – Twisting couple on a wire – Work done in twisting – Torsional pendulum – determination of rigidity modulus of a wire.

UNIT – II : Bending of beams:

Expression for bending moment – Cantilever – Expression for depression – Experiment to find Young's modulus – Cantilever oscillation – Expression for period – Uniform bending – Expression for elevation – Experiment to find Young's modulus using microscope – Non Uniform bending – Expression for depression – Experiment to determine Young's modulus using mirror and telescope.

UNIT – III : Surface tension & Low Pressure

Definition and dimensions of surface tension – Excess of pressure over curved surfaces – Variation of surface tension with temperature – Jaegar's experiment. Production and measurement of low pressure – Grades' molecular pump – Knudsen's absolute gauge – Detection of leakage.

UNIT – IV : Viscosity :

Streamlined motion – Turbulent motion – Coefficient of viscosity and its dimension – Rate of flow of liquid in a capillary tube – Poiseuille's formula – Experiment to determine the coefficient of viscosity of liquid.

UNIT – V : Acoustics:

Music and noise – Characteristics of musical sound, quality of tone, consonance and dissonance – musical scale – tempered scale – decibel – noise pollution. Source in an enclosure – reverberation and time of reverberation – Sabine's formula – Eyring Formula – Optimum reverberation – measurement of reverberation time – absorption coefficient - acoustics design – Ultrasonics – production , properties and applications.

Books for study and reference:

1. Properties of matter – Brijlal and Subramanian
2. Properties of matter – D.S.Mathur.
3. Properties of matter – Subramania Iyer and Jeyaraman.
4. Oscillations, waves and sound – L.P. Sharma, H.C.Saxena.
5. A text book of sound – R.L.Saigal.
6. A text book of sound – N.Subrahmanyam and Brijlal.