

**SARDAR PATEL UNIVERSITY**  
**Programme: B.Sc**  
**Semester: I**  
**Syllabus with effect from: June-2011**

<b>Paper Code: US01CPHY01</b>	<b>Total Credit: 2</b>
<b>Title of Paper: Properties of Matter &amp; Sound Wave</b>	

Unit	Description in Detail	Weightage (%)
I	<b>Elasticity - I</b> Introduction, Load, Stress and Strain, Hooke.s Law & Stress-strain diagram Three types of elasticity, Work done per unit volume in elongation strain Deformation of a cube - Bulk modulus, Modulus of rigidity, Young modulus, Relation connecting the elastic constants, Poisson.s ratio, Limiting values of $\sigma$ , Determination of Poisson's ratio for rubber.	25%
II	<b>Elasticity - II</b> Twisting couple on a cylinder (or wire), Torsional pendulum, Determination of n, Statistical method (Horizontal twisting apparatus for a rod), Maxwell.s vibrating needle method, Determination of M.I with the help of torsional pendulum, Bending of beam, Bending moment, The cantilever - when the weight of beam is ineffective, Depression of a beam supported at the endswhen the beam is loaded at the centre.	25%
III	<b>Sound - I</b> Introduction to transverse and longitudinal waves, Velocity of longitudinal waves in gaseous medium, Calculation of velocity of sound in air, Effect of pressure, temperature and humidity on the speed of sound, Velocity of sound in metal rod, Kundt.s tube, Applications of Kundt.s tube.	25%
IV	<b>Sound - II</b> Doppler.s effect, Applications of Doppler.s principle, Musical sound and noises Characteristics of musical sounds, Intensity of sound, Measurement of intensity, Ultrasonic waves, Production of ultrasonic waves, Detection of ultrasonic waves, Properties of ultrasonic waves, outline of the applications of ultrasonic waves.	25%

**Basic Text & Reference Books:**

- Elements of properties of matter - D. S. Matur, S. Chand & Co., New Delhi
- Engineering Physics, R. K. Gaur and S. L. Gupta - Dhanpatrai Publication (P) Ltd., New Delhi

