

## PHYSICS

*From -2013-14*  
**B.Sc.- THIRD YEAR**

		<b>Max. Marks</b>
PAPER I	RELATIVITY AND STATISTICAL PHYSICS	75
PAPER II	SOLID STATE AND NUCLEAR PHYSICS	75
PAPER III	SOLID STATE ELECTRONICS	75
PRACTICAL	TWO PRACTICALS (50 MARKS) + VIVA (15 MARKS) + RECORD (10 MARKS)	75
TOTAL		300

Candidate must obtain minimum pass marks in Theory and Practical Examinations separately.

# PAPER I - RELATIVITY AND STATISTICAL PHYSICS

## UNIT-I

### Relativity

Reference systems, inertial frames, Galilean invariance and conservation laws, propagation of light, Michelson-Morley experiment; search for ether.

Postulates for the special theory of relativity, Lorentz transformations, length contraction, time dilation, velocity addition theorem, variation of mass with velocity, mass-energy equivalence, particle with a zero rest mass.

## UNIT -II

### Statistical physics

**The statistical basis of thermodynamics:** Probability and thermodynamic probability, principle of equal a priori probabilities, probability distribution and its narrowing with increase in number of particles. . The expressions for average properties. Constraints; accessible and inaccessible states, distribution of particles with a given total energy into a discrete set of energy states.

## UNIT - III

**Some universal laws:** The  $j$ - space representation, division of  $i$ - space into energy sheets and into phase cells of arbitrary size, applications to one-dimensional harmonic oscillator and free particles. Equilibrium before two systems in thermal contact, bridge with macroscopic physics. Probability and entropy, Boltzmann entropy relation. Statistical interpretation of second law of thermodynamics. Boltzmann canonical distribution law and its applications; rigorous form of equipartition of energy.

## UNIT -IV

**Maxwellian distribution of speeds in an ideal gas:** Distribution of speeds and of velocities, experimental verification, distinction between mean, r.m.s. and most probable speed values. Doppler broadening of spectral lines.

