PHYSICS

PAPER - I

Group A : Mechamics, General Properties of Matter and Sound :

Group B : Optics, Heat & Thermodynamics :

(N.B. Should have wide coverage of topics with uniform.
Q.P. distribution of marks, as far as practicable)

Group A : Newton's Laws of motion : force, torque and impulse

(Mechanics) relation between linear and angular momentum. Galilean transformation, Invariance of Laws of motion under Galilean transformation, Angular velocity and angular acceleration, rotational motion under constant acceleration.

Motion of a rigid body about an axis, Moment of Inerita : Radius of gyration, theorem of perpendicular and parallel axes, Calculation of moment of inertia of common symmetrical bodies rod, cylinder, disc and sphere, Gyroscopic motion-precession and mutation.

Simple Harmonic Motion, Differential equation of SHM, and its solution,, kinetic and potential energy of a body execution SHM, simple compound and torsional pendulum, bar pendulum, Kater's pendulam and determination of 'g' by Kater's pendulam.

Kepler's laws of planetary motion, Newton's Laws of gravitation : Determination of gravitational constant, Velocity of escape, Artificial satellites.

General Properties of Matter, Elasticity, Hooke's Laws, Inter relation between elastic constants, Bending Beam fixed at one end and loaded at the other end.

Viseosity of fluids, Poiseullie's equation determination of viscocityof liquid.

Surface Tension,Relation betweensurface tention and surface energy, angle of contact, excess pressure inside a soap buble, rise of liquid in a capillary tube, Determination of surface tension capillary tube method, Production and measurement of low pressure, rotary and diffusion pump, Mcleod gauge.

(Sound Vibration) : Free and forced, vibration, resonance equation of wave motion, transverse and longitudinal waves, beat, velocity of sound, its expression in homogeneous, Medium, effect of temperature and pressure on velocity of sound in air.

Vibration of String : Velocity of transverse waves in string, stationary waves in strings and air colum, Ultrasonic sound, application of Ultrasoni Waves.

Group B : Combination of two thin lenses seperated by a

(**Optics)** distance, Achromatic combination of lenses and prism. Defects of optical images, spherical aberration, Chromatic aberration and their remedies, ramsden & Heygens eye-pieces, Aplanatic foci, oil immersion objective, Interference of light, Fresnel's biprism, Llo-yd's mirror, Colours of thin films, Newton's rings.

Production and analysis of polarised light, interference of parallel and convergent polarised light, lasser and its applications.

(Heat and Thermodynamics) Kinetic theory of gas, Perfct gas laws, theory of specific heat, Brownian motion, Vander Waal's equation, Liquefaction of gases, critical constants, First and Second Laws o thermodynamic, Reversible and irreversible processes, Carnot's engine and Carnot's Cycle, Carnot's theoriem, Kelvin's thermodynamic, scale of temperature and its relation to perfect gas scale, Givv's phase rule, Triple points Joule Thomson effect, Adiabatic demagnetisation, Black body rediation, Flank's law of radiation, Fermi-dirac

statistics and their application to degenerate electron gas, Bose Einstein distribution laws, Solar energy and its utilisation.

PHYSICS

PAPER - II

Group A : Electricity and Magnetism.

Group B : Atomic and Nuclear Physics, Electronics

(N.B. : Q.P. should have wide coverage of the topics with fairly uniform distribution of marks, as far as practicable)

Group A : Field potential and their relation, Gauss's theorem, Application of Gauss's theorem to simple problems, Mechanical forces on charged conductor, Energy in an electrostatic medium.

Attracted disc electrometer, Effect of dielectric on capacity, Measurement of dielectric constant in the form of a solid slab, Magnetic potential, Potential and field due to dipole Forces and couple in dipole in a magnetic field, between two dipoles, Magnetic shell, Potential due to a magnetic shell, Magnetic sucseptibility and permeability, Hysteresis loss, Elements of dia, para and ferro magnetism, Laplace's law and its application to circular coil carrying current a solenoid carrying current Helmholtz coil Moving coil galvanometer, Kirchhoffs laws and its applications to Wheastone net work of conductors.

Thermoelectricity, Peltier and Thomson effect, Electromagnetic induction, Self and Mutual induction, Growth and decay of current in RC and LC circuits, Induction Coil.

Alternsting Current, reactance and impendance of a L-C-R Circuit and power in A.C. Circuit, Power factor, A.C. generation, dynamo, motor, Transformer and current trnsmission.

Group B : (Atomic and Nuclear Physics) :

Effect of electric and magnetic field on charged particles in mition, e/m of an electron, Millikan's method of determination of charge of an electron, Mass spectrograph, Aston and Bainbridge.

Mass energy equivalence, X-ray production and properties, continuous and characteristic X-rays, Bragg's law and X-ray wave-length. Bohr's theory of hydrogen spectra, Photoelectric efect and Einstein explanation, Application of photoelectric effect, Radioactive decay constant, half life, mean life, carbon dating, Beta Ray spectrum & Noutrine.

Nuclear transmutation, Fission and Fusion Atomic energy, atomi reactors, Particle Acclerators - LINAC, cyclotron.

Nuclear detectors : GM counter, Scientillation counter, Cloud chamber, and bubble chamber, Cosmic Rays, Primary and Secondary Cosmic Rays, Geomagnetic effect and origin of Cosmi Rays, Air showers.

(Elements of electronic) :

Thermoionic emmission, Triode as an amplifier and Oscillator.

Working of PNP and NPN transistors, Current Voltage Power amplification of transistor circuits, Amplifier circuit for audio frequency signal. Radio broadcasting and reception Television.