APPENDIX - 'F'

CENTRAL BOARD OF SECONDARY EDUCATION SYLLABUS FOR SNR. SEC. SCH. PHYSICS CLASSES (CBSE - 1987)

CLASS XI		100 Marks
One Theory Paper	3 Hours	70 Marks
One Practical	3 Hours	30 Marks

Unit-wise distribution of marks	Marks
Unit 1 Measurement	6
Unit 2 Motion	8
Unit 3 Circular Motion	10
Unit 4 Kinetic theory of Gases	8
Unit 5 Thermo-dynamics	12
Unit 6 Liquids	8
Unit 7 Electricity	12
Unit 8 Universe	6

Measurement :

Concept of length and time, atomic to astronomical range of variation of these quantities, different methods of measurement for different magnitudes of the same physical quantity. SI units, statement of all SI units, conversion of C.G.S. system's units into SI units (Not to be evaluated).

Dimension and dimensional equation of mechanical quantities – area, volume, velocity, acceleration, momentum, force, moment, energy and work.

Motion :

Displacement as a vector quantity, vectors, addition and substraction of vector, scalar (dot) and vector (cross) product (not to be done in depth). Newton's first law, conservation energy and momentum, collisions, kinematics, Newton's second law and definition of force, inertial and gravitational mass, impulse, equations of motion, projectiles, work, relation between work energy, power, Newton's third law, function : sliding and rolling friction.

Circular Motion :

Motion of a body in circula orbit, centripetal force, planetary motion, statement of Kepler's laws, Newton's law of gravitation, Earth's satellites, orbital and escape velocity, rigid body rotation, moment of inertia-definition and the expressions for a ring and a circular disc, torque, angular momentum and conservation of angular momentum.

Kinetic Theory of Gases :

Basic assumptions, derivation of expression for pressure, temperature, translatational degrees of freedom, mean energy, gas equation, specific heats of gases, relation between Cp and C_v ($Cp - Cv = R/J$).

Thermo-dynamics :

Work and heat, first law of Thermodynamics, reversible and irreversible process, Carnot-cycle (qualitative), efficiency of Carnot engine, second law of Thermodynamics, absolute scale of temperature, refrigerator of, law of radiation, emmissive power, abosrptive power, black-body radiation, Kirchoff's law, Stefan's law, pyrometers, energy distribution of black-body radiation, Wien's law.

Liquids :

General ideas of intermolecular forces, nature of liquids, cohesion and adhesion surface tension, surface energy, angle of contact, capillarity, types of flows- laminar turbulent, Reynold's number, Bernoulli's equation and its application, viscosity, Stokes' law (derivation from dimensional analysis) and its application.

Electricity:

Electric current, thermal effect - Joule's law; thermo-electric effect; Seeback effect, thermocouple and its use for temperature measurement, chemical effect, magnetic effect : Biot Savart's law, moving coil galvanometer, moving charge in a magnetic field, e/m by Thomson's method, cyclotron.

Universe :

General ideas about stars and galaxies : elements of optical and radio astronomy, quasars and pulsars, recent findings about Solar system using probes, elementary ideas about the theories of the origin of the universe.

Books Recommended :

1. "Physics for classes XI and XII", published by NCERT, New Delhi-16, (Hindi version also available).

2. "Basic Concepts of Physics"of by Shri K.K. Mohindru, published by M/s. Pitamber Publishing Company, New Delhi.

3. "A Text book of Physics by Shri D.C. Kulshreshtha, published by M/s. Shri Mahavir Book Depot, Delhi.

4. "Senior School Physics Part I" by Shri S.P. Talwar, Published by M/s Kem Publishers, New Delhi.

5. "Madyamik Bhotiki Part I" by Shri K.L. Sikka and Shri B.L. Gera, published by M/s Kitab Mahal, Allahabad.

CLASS XII   100 Marks

One Theory Paper   3 Hours   70 Marks
One Practical Paper   3 Hours   30 Marks

Unit-wise distribution of Marks: Marks

Unit 1 Wave Motion   10
Unit 2 Optics   7
Unit 3 Electromagnetic Induction   8
Unit 4 Physics of the Atom   8
Unit 5 Solids   7
Unit 6 Characterisation of materials (elementary
        treatment of : mechanical, thermal,
        electrical and magnetic).   7
Unit 7 Concept of Space, Time and Mass in Relativity 6
Unit 8 Nuclear Physics   9
Unit 9 Electronic Devices.   8

Wave Motion :

Simple harmonic motion, waves and wave propagation in matter, characterisation of wave motion (including phase) coherence, graphical and analytical description in terms of periodicity in time and space, superposition of waves, longitudinal and transverse waves, stationary waves and beats, water waves and light waves: reflection, refraction, dispersion, polarization (Experimental description only), interference and diffraction. Doppler effect, waves in strings and solids, elements of acoustics of buildings.

Optics :

Huygen's construction (geometrical), Young's double slit experiment (idea of path difference), Lloyd's mirror, colour of thin films (qualitative), single slit diffraction application of laser beams, spectrometer, production of different types of spectral line-continuous and absorption.

Electromagnetic induction:

Lenz's law, eddy current, Faraday's laws of electromagnetic induction: rotating coil magnetic field-alternating current; transformers, long distance transmission; dynamo and motors: Phaserelationship between voltage between voltage and current for pure resistance, self-inductance and mutual inductance; reactance, capacitance; and impedance (qualitative only), elementary idea of electromagnetic waves.

Physics of the Atom:

Electrons, cathode rays, Rutherford's scattering experiment and its consequences, Bohr model of atom-his postulates, origin of spectra, spectrum of hydrogen atom. electron configuration of the atoms; X-ray- their production and properties: X-rays spectra-its characteristics and explanations.

Photoelectric effect, laws of photoelectric emission, dual nature of radiation and matter; de Broglie's relation and its application (experimental evidence).

Solids :

Structure of solids, crystalline and amorphous substances; idea of a lattice, cubic and hexagonal crystals, packing in crystals; binding in solids ionic, covalent, Van der Wall and metallic; electrons in solids; classification of metals, semi-conductors and insulators; energy bands in solids; (descriptive idea only), energy gap in insulator, intrinsic and extrinsic semi-conductors; p-type and n-type semi-conductors.

Characterisation of materials (elementry treatment of the following):

Mechanical - elastic and plastic behaviours of solids, tensile stress, Young's modulus, elastic limit, shear and bulk modulus, compressional stress.

Thermal - thermal energy, specific heat, thermal expansion, thermal conductivity.

Electrical - conductivity, dielectric constant and its physical significance (effect on capacitance).

Magnetic - dia, para and ferro-magnetic substances, magnetic permeability (effect on magnetic flux, hysteresis and ferrites (optional).

Concept of Space, Time and Mass in Relativity :

Definition of observer, event and frame of reference, principle of relative motion. Gallilean transformation, Newtonian relativity principle, nature of light, Michelson and Morley experiment, special theory of relativity.

Nuclear Physics :

Atomic nucleus, general idea of nuclear force, nuclear mass, binding energy, nuclear mass defect, nuclear reactions (symbolic representation), discovery of neutrons, artificial radioactivity radioisotopes, uses of tracers in medicine, industry and agriculture, elementary ideas about fission, energy released, chain reaction and controlled chain reaction; reactors; fusion, energy generation in sun and stars; radiation hazards, accelerators, elementary particles, cosmic rays.

Electronic Devices :

Thermionic emission, idea of work fuction; vacuum diode-construction and characteristics diode-a non linear-its application in rectifiers and deterctors; vacuum triode-construction and characteristics, p-n junctions, p-n -p and n-p-n junctions. Applications of vacuum triode and transistor in amplifiers and oscillators; cathode ray tube-- its application Radar and television.

Books Recommended :

1. 'Physics for class XI-XII', Published by NCERT, New Delhi (Hindi version also available).

2. "Physics for Class XII" by D.S. Mathur published by Sultan Chand & Sons, Darya Ganj, New Delhi.

3. "Physics Part II" by Shri S.B. Singh, Shri R.S. Mittal & Shri B.J. Kohli published by Arya Book Depot, Karol Bagh, New Delhi.

4. "Senior School Physics" by Dr. R.S. Gupta and Dr. A.K. Kavathkar published by Frank Brothers and Co. Pvt. Ltd. Darya Ganj, New Delhi.

5. Text Book of Physics' by Dr. N.K. Bajaj, Dr. R.K. Garg & Dr. S.K. Mattoo published by Tata Mc Graw-Hill Publishing Co., Asaf Ali Road, New Delhi.

6. "Basic Concepts of Physics Vol II" by Sh. K.K. Mohindroo published by Pitamber Publishing Co., Educational Publishers, Karol Bagh, New Delhi.

7. "Physics -- A Modern Approach" by Shri J.S. Dhami & P.C. Chhabra, published by Anil Prakashan, Darya Ganj, New Delhi.

8. "A Text book of Physics Part II" by D.C. Kulshreshtha published by Shree Mahavir Book Depot, Nai Sarak, Delhi.