APPENDIX - H

CENTRAL BOARD OF SECONDARY EDUCATION SYLLABUS FOR SNR. SEC. SCH. PHYSICS CLASSES (CBSE - 1993)

Objectives:

Through this course in Physics, the learner should:

(i) develop competence to pursue professional courses like engineering, medicine, dentistry in his future career;

(ii) get knowledge, understanding and application abilities about different aspects of physics.

(iii) strengthen his foundations for further study of physics;

(iv) develop enough interest in the study of physics and

(v) acquire necessary manipulative and experimental skills.

CLASS XI (THEORY)

One Paper (Theory) 3 hours 70 marks

Unitwise Weightage

Unit		Marks
1.	Introduction, Physical world and Measurement	5
2.	Description of motion in one dimension	5
3.	Description of motion in two or three dimension	6
4.	Laws of Motion	6
5.	Work, Energy and Power	7
6.	Rotational motion	6
7.	Gravitation	6
8.	Properties of Matter	10
9.	Heat and Thermo-dynamics	8
10.	Oscillations	5
11.	Waves	6

Note : Portions of Units given below with star marks are non-evaluative.

Unit -1 : Introduction and Measurement: 12 Pds

What is Physics; Scope and exciteement; Physics in relation to science; society and technology. Need for measurement, units for measurement, systems of units; units - SI: fundamental and derived units. Dimensions and its applications. Orders of magnitude, Accuracy and errors in measurement random and instrumental errors, Significant figures and rounding off, Graphs, Trigonomitric functions, Simple ideas of differentiation and integration.

Unit -2 : Description of Motion in one Dimension: 12 Pds.

Objects in Motion in one dimension. Motion in a straight line, unit and direction for time and position measurement. Uniform motion, its graphical representation and formulae, speed and velocity, relative velocity. Uniformly accelerated motion, its velocity, relative velocity. Uniformly accelerated motion, its velocity-time graph, position-time graph, and formulae. General relation between position and velocity, application to uniformly accelerated motion. Acceleration in general one-dimensional motion.

Unit -3 : Description of Motion in Two and Three Dimensions: 15 Pds.

Vectors in two dimensions, general vectors, vectors and scalars, vector addition and multiplication by a real number, zero-vector and its properties. Resolution of a vector in a plane, rectangular components. Scalar and Vector Product. Motion in two dimensions, cases of uniform velocity and uniform acceleration-projectile motion, general relation among position - velocity - acceleration for motion in a plane - uniform circular motion. Motion of objects in three dimensional space (elementary ideas).

Unit -4 : Laws of Motion: 15 Pds

Force and inertia, first law of motion. Momentum, second law of motion, impulse, some kinds of forces nature. Third law of motion, conservation of momentum, rocket propulsion. Equilibrium of concurrent forces. Static and kinetic friction, laws of friction, rolling friction, lubrication. Inertial and non-inertial frames (elementary ideas).

Unit -5 : Work, Energy and Power: 17 Pds

Work done by a constant force and by a variable force, unit of work, kinetic energy, power. Elastic collision in one and two dimensions. Potential energy, gravitational potential energy and its conversion to kinetic energy, potential energy of a spring. Different forms of energy, mass energy equivalence, conservation of energy.

Unit - 6 :- Rotational Motion: 14 Pds

Centre of mass of a two particle system, momentum conservation and centre of mass motion. Centre of mass of a rigid body, general motion of a rigid body, nature of rotational motion, rotational motion of a single particle in two dimension only, torque, angular momentum and its geometrical and physical meaning, conservation of angular momentum, examples of circular motion (car on a level circular road, car on a banked road, pendulum swinging in a vertical plane). Comparison of linear and rotational actions, moment of inertia, its physical significance, parallel axis and perpendicular axis theorem (statement only), examples of two dimensional rigid body motion (cylinder rolling without slipping).

Unit 7: Gravitation : 14 Pds.

Acceleration due to gravity, one dimensional motion under gravity, two-dimensional motion under gravity. Universal law of gravitation, inertial and gravitational mass, variations in the acceleration due to gravity of the earth, orbital velocity, geostationary satellites, Gravitational potential energy near the surface of earth, gravitational potential, escape velocity.

Unit 8: Properties of Matter : 24 Pds.

Inter-atomic and inter-molecular forces, states of matter.
A. Solids: Hooke's law, Young's modulus, stress vs. strain, bulk modulus, pure shear.
B. Fluids: Fluid pressure, Pascal's law, effect of gravity, atmospheric pressure, Buoyancy, Archimedes' principle, Surface energy and surface tension, drops and bubbles capillary rise, detergents and surface tension. Viscosity, sphere falling through a liquid streamline flow, Reynold's number, Bernoulli's theorem.
C. Gases: Kinetic theory of gases, pressure exerted by a gas kinetic energy and temperature, absolute temperature, gas laws and Avogadro's number.

Unit 9 : Heat and Thermodynamics : 19 Pds.

Specific heat, specific heat at constant volume and constant pressure of ideal gas, relation between them, first law of thermodynamics. Thermodynamic state, equation of state and isothermals, pressure-temperature phase diagram. Thermodynamic processes (reversible, irreversible, isothermal, adiabatic), Carnot cycle, second law of thermodynamics, efficiency of heat engines. Conduction, convection and radiation. Thermal conductivity, black body radiation, Wien's, Stefan's law, Newtons law of cooling.

Unit 10 : Oscillations : 12 Pds.

Periodic motion, simple harmonic (S.H.M.) and its equation of motion. Oscillations due to a spring, kinetic energy and potential energy in S.H.M., simple pendulum, physical concepts of forced oscillations, reasonance and damped oscillations.

Unit 11 : Waves : 14 Pds.

Wave motion, speed of wave motion, principle of super-position reflection of waves, harmonic waves (qualitative treatment only) standing waves and normal modes and its graphical representation. Beats, Doppler Effect. Musical scale, Accoustics of buildings.

Books Recommended

1.	Physics Part I	NCERT, New Delhi
2.	Physics Part II	-do-
3.	भौतिकी भाग 1	-do-
4.	भौतिकी भाग 2	-do-
5.	Senior School Physics	M/s Sultan Chand & Sons, 4792/23, Ansari Road, Darya Ganj, New Delhi-2.
6.	Physics for Class XI	Macmillan India Ltd., Post Box 7092, 2/10, Ansari Road, New Delhi.
7.	Physics XI (Part I)	M/s Arya Book Depot, 30, Naiwala Karol Bagh, New Delhi - 110005.
8.	Basic Principles Vol I	M/s Pitamber Publishing Co., 888 East Park Road, Karol Bagh, New Delhi - 110005.
9.	Senior School Physics for Class XI	M/s Frank Bros & Co.,4675-A, Ansari Road, Darya Ganj, New Delhi-110002.

CLASS XII (THEORY)

One Paper (Theory) 3 hours 70 Marks

Unitwise Weightage

UNIT		MARKS
1.	Electrostatics	8
2.	Current Electricity	7
3.	Thermal and Chemical Effects of Current	4
4.	Magnetic effect of Current	4
5.	Magnetism	4
6.	Electromagnetic Induction and Alternating Currents	8
7.	Electromagnetic Waves	3
8.	Wave Optics	4
9.	Ray Optics and Optical Instruments	7
10.	Electrons and Photons	4
11.	Atoms, Molecules and Nuclei	6
12.	Solid and Semiconductor Devices	8
13.	Universe	3

NOTE : Portions of Units given below with Star Mark (*) are non-evaluative.

Unit -1 : Electrstatics 18 Pds.

Frictional electricity, charges and their conservation, elementary unit, Coulomb's law, dielectric constant, electric field, electric field due to a point charge,

dipole, dipole field and dipoles' behaviour in an uniform (2-dimensional) electric field, flux, Gauss's law in simple geometrics(*), Conductors and insulators, presence of free charges and bound charges inside a conductor, Dielectrics (concept only), Capacitance (parallel plate) series and parallel, energy of a capacitor high voltage generators, atmospheric electricity(*).

Unit -2 : Current Electricity: 17 Pds.
Introduction (flow of current), sources of e.m.f. (cells: simple, secondary, chargeable), electric current, resistance of different materials, temperature dependence, thermistor(*), specific resistivity, colour code for carbon resistances. Ohm's law, Kirchoff's law, resistances in series and parallel, series and parallel circuits, Whetstone's bridge, measurement of voltages and currents, potentiometer.

Unit -3 : Thermal and Chemical Effects of Currents: 10 pds.
Electric power, heating effects of currents, chemical effects and laws of electrolysis, simple concept of thermoelectricity; thermocouple.

Unit -4 : Magnetic Effect of Currents: 10 Pds.
Oersted's observation, Biot-Savart's law (magnetic field due to a current element), magnetic field due to a straight wire, circular loop and a solenoid. Force on a moving charge in a uniform magnetic field (Lorentz force), Cyclotron (simple idea), forces and torques on currents in a magnetic field, forces between two currents, definetion of ampere, moving coil galvanometer, ammeter and voltmeter.

Unit -5 : Magnetism: 10 Pds.
Bar magnet (comparison with a solenoid), lines of force torque on a bar magnet in a magnetic field, tangent galvanometer, vibration magnetometer, para, dia and ferromagnetism (simple idea).

Unit -6 : Electromagnetic Induction and Alternating Currents: 19Pds
Induced e.m.f., Faradays's Law, Lenz's Law, induction, self and mutual inductance, alternating currents, impedance and reactance, power in a.c., circuits with L, C and R, series circuit, resonant circuits (Phase diagram) and electrical machines and devices (transformer, induction coil (*) generator, simple motors, choke and starter).

Unit -7 : Electromagnetic Waves(Qualitative Treatment) 7 Pds.
Electromagnetic oscillations, some history of electromagnetic waves (Maxwell, Hertz, Bose, Marconi). Electromagnetic spectrum (radio, micro-waves, infra-red, optical, ultraviolet, X-rays, alpha, beta and gamma rays) including elementary facts about their uses and propagation, properties of the atmosphere w.r.t. various parts of electromagnetic spectrum.

/earth's magnetic field

Unit -8 : Wave Optics: 10 Pds.
Wave front and Huygen's principle, Interference -- Young's double slit experiment, Diffraction -- Diffraction due to a single slit, Diffraction grating (*) Polarisation -- Polarisation of transverse waves. Applications related to these phenomena.

Unit -9 : Ray Optics and Optical instruments: 17 Pds.
Ray Optics as a limiting case of wave optics, Reflection, refraction, total internal reflection, optical fibre, curved mirrors, lenses, mirror and lens formulae. Dispersion by a prism, spectrometer and spectra -- absorption and emission; scattering, rainbow. Magnification and resolving power, telescope (Astronomical), microscope.

Unit -10: Electrons and Photons: 10 Pds.
Discovery of electron, e/m for an electron, electrical conduction in gases, particle nature of light, Einstein's photoelectric equation, photocells.

Unit -11: Atoms, Molecules and Nuclei 14 Pds.
Rutherford model of the atom, Bohr model, energy quantization, hydrogen spectrum, composition of a nucleus atomic masses, isotopes, size of nucleus, radio-activity. Mass energy relation, nuclear fission and fusion, nuclear holocaust.

Unit -12: Solids and Semiconductor Devices: 19 Pds.
Crystal Structure-- Unit cell; single, poly and liquid crystals (concepts only) Energy bands in solids, conductors, insulators and semi-conductors, P-N Junction, Diodes, Junction Transistor, diode as rectifier, transistor, as an amplifier and oscillator, logic gate and combination of gates.

Unit -13: Universe: 7 Pds.
The constituents of the universe; planets: elementary idea about determination of their distances and masses; stars: brightness, magnitude scale, luminosity, surface temperature;s stellar spectra (*) energy source of stars (Concept only).

Books Recomended:

1.	Physics Part I (New Book)	NCERT
2.	Physics Part II (New Book)	-do-
3.	भौतिकी भाग 1 (नई)	-do-
4.	भौतिकी भाग 2 (नई)	-do-
5.	'A' Level Physics-a text book	M/s Inter University Press (P) Ltd., 30/7, Shakti Nagar, Delhi-110007
6.	Basic Principles of Physics	M/s Pitamber Publishing Co., 888, East Park Road, Karol Bagh, New Delhi-110005.
7.	Sr. School Physics	M/s Sultan Chand & Sons, 23, Darya Ganj, New Delhi - 110002.

8.	Physics Part II	M/s Arya Book Depot, 30, Naiwalla, Karol Bagh, New Delhi - 110005.
9.	Senior School Physics for Class XII	M/s Frank Bros & Co., 4675-A Ansari Road, Darya Ganj, New Delhi - 110002.
10.	A text book of Plus two Physics	M/s Macmillan India Ltd. Post Box 7092, 2/10, Ansari Road, New Delhi.

Note : Books mentioned at S.N. 5,6, and 10 have been recommended subject to fixation of prices by the Board.