CLASS- 12 (CBSE)

SUBJECT – PHYSICS

Minimum Level of Learning (

Chapter	Contents
1.Electric charges and field	▪ Quantisation of charge ▪ Coulomb's law vector form ▪ Electric flux ▪ Electric dipole, Electric dipole moment ▪ State Gauss's law **Derivations** ➢ Electric field due to an electric dipole (a) for points on the axis(b) on the equatorial plane ➢ Torque on a dipole in a uniform electric field ➢ Application of Gauss's law (a) Field due to charged long wire (b) charged plane sheet(c)Charged Thin spherical shell **Diagrams** ▪ Figure - 1.15, 1.17(a,b,c,d)
2. Electric potential and capacitance	▪ **P**roperties f equipotential surfaces **Derivations** ▪ **E**lectric potential due to a point charge ▪ Electric potential due to a dipole at (a)any point(b) axial point(c) equatorial plane ▪ **Po**tential energy of a dipole in an external electric field ▪ Capacitance of a capacitor ▪ Capacitance with dielectric

	Figure – 2.4 , 2.9(a,b,), 2.10, 2.11(a,b)
3.Current Electricity	▪ Ohm's law ▪ Mobility ▪ Internal resistance, emf, potential difference ▪ Kirchhoff's laws **Derivations** ▪ Relation **$I = neAv_d$** ▪ Expression of resistivity in terms of relaxation time and number density ▪ Vector form of Ohm's law ▪ Cells in series ▪ Cells in parallel ▪ Wheatstone Bridge and balancing condition **Figure** – 3.5 , 3.6, 3.7,3.9,3.10,3.11
4.Moving charges and magnetism	▪ **L**orentz force equation ▪ Define one Tesla ▪ Biot- Savart law ▪ Current sensitivity ▪ Voltage sensitivity ▪ Conversion of galvanometer to ammeter and voltmeter **Derivations** ▪ Force on current carrying conductor in a magnetic field ▪ Motion of a charged particle in a perpendicular magnetic field. ▪ Magnetic field at the centre of a circular current loop and along the axis. ▪ Ampere Circuital law and Application of Ampere's law to a straight current carrying conductor and solenoid ▪ Example 4.8(page 149) ▪ Force between two parallel current carrying conductors and define one ampere.

	▪ Torque experienced by a current loop in a uniform B. ▪ Working of moving coil Galvanometer
5. magnetism and matter	➢ Torque on a magnetic dipole in a uniform magnetic field ➢ Potential energy of a magnetic dipole. ➢ Diamagnetism, paramagnetism, Ferromagnetism(examples and properties) **Figure:** 5.12(a,b)
6. E M I	▪ Faraday's laws ▪ Lenz's law ▪ Definition of mutual induction and self induction ▪ Magnetic flux ▪ Eddy current **Derivations** ➢ **C**oefficient of mutual induction ➢ Coefficient of self induction ➢ Generator –principle, construction ,working ➢ Induced emf and current
7.A C	**Derivations** ▪ Series LCR circuit,phasor diagram,Impedance ▪ Resonance condition ▪ power in an AC circuit (Inductor , Capacitor and Resistor Circuit) ▪ Avg power associated with series LCR ▪ power factor ▪ Transformer(Step up &Step down)

8. E M Waves	➢ **P**roperties of electromagnetic waves ➢ Figure 8.4, Equations 8.7(a),8.7(b) ➢ Electromagnetic spectrum –Range of frequency and Wave length-Application-Properties
9.Ray optics	▪ Total internal reflection- conditions and applications **Derivations** ▪ Refraction at spherical surface ▪ Lens maker's formula ▪ Combination of thin lenses in contact ▪ Refraction through a prism- Prism formula ▪ Magnifying power of microscope and telescope **Figures**: 9.15, 9.16, 9.24, 9.28, 9.29, 9.30
10. Wave optics	• Hygen's principle • Definition of wave front • Difference between Interference and Diffraction • Definition of Interference and refraction **Derivations** ▪ **L**aws of reflection ▪ Laws of refraction ▪ Condition for constructive and destructive interference **Figures:** 10.2, 10.7 a, b, c, 10.14, 10.17

11.Dual Nature of Radiation and matter	▪ Work function ▪ Photo electric effect and equation ▪ De Broglie hypothesis ▪ Effect of potential on photo current ▪ Effect of intensity on photo current **Derivation** ▪ Wave length of electron **Figures:**11.2, 11.3, 11.4, 11.5
12. Atoms	▪ Alpha particle scattering experiment ▪ Bohr's quantisation ondition **Derivations** • **R**adius of n^{th} orbit of hydrogen atom • Energy of electron • Spectral series and energy levels **Figures**: 12.8, 12.9, 12.10
13. Nuclei	▪ Mass defect and its formula ▪ Binding energy and its formula ▪ Nuclear force properties **Figures** **13.1, 13.2**
14.Semiconductor	▪ Definitions of valance band and conduction band ▪ Formation of PN junction diode ▪ PN junction diode –Forward bias and Reverse bias ▪ Full wave rectifier **Figures** ➢ **1.4.2(a, b, c), 14.6(a, b), 14.9(a ,b), 14.16(a, b, c), 14.19(a, b, c)**