CLASS- 12 (CBSE)

SUBJECT – PHYSICS

Minimum Level of Learning (for 60% marks)

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** - Coefficient 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 nth 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)**