

**TELANGANA STATE BOARD OF INTERMEDIATE EDUCATION,**  
**HYDERABAD**

**ACADEMIC YEAR 2020-2021**

**70% CONTENT IN VIEW OF COVID-19 PANDEMIC**

**INTERMEDIATE 2<sup>nd</sup> YEAR PHYSICS SYLLABUS**

**CHAPTER – 1: WAVES**

- 1.1 Introduction
- 1.2 Transverse and Longitudinal waves
- 1.3 Displacement relation in a progressive wave
- 1.4 Speed of a Travelling Wave
- 1.5 The principle of superposition of waves,
- 1.6 Reflection of waves
- 1.7 Beats

**CHAPTER– 2: RAY OPTICS AND OPTICAL INSTRUMENTS**

- 2.1 Introduction
- 2.3 Refraction
- 2.4 Total Internal Reflection
- 2.5 Refraction at Spherical Surfaces and by Lenses.
- 2.6 Refraction through a prism
- 2.7 Dispersion by a Prism
- 2.8 Some Natural phenomena due to Sunlight (except 2.8.2)
- 2.8.1 The Rainbow
- 2.9 Optical Instruments

**CHAPTER – 3: WAVE OPTICS**

- 3.1 Introduction
- 3.2 Huygens Principle
- 3.3 Refraction and Reflection of plane waves using Huygens Principle
- 3.4 Coherent and Incoherent Addition of waves
- 3.5 Interference of Light waves and Young's Experiment
- 3.6 Diffraction (except 3.6.3)
- 3.6.1 The single slit
- 3.6.2 Seeing the single slit diffraction pattern
- 3.6.4 The validity of ray optics

## **CHAPTER – 4: ELECTRIC CHARGES AND FIELDS**

- 4.1 Introduction
- 4.2 Electric Charges
- 4.3 Conductors and Insulators
- 4.4 Charging by Induction
- 4.5 Basic Properties of Electric Charge
- 4.6 Coulomb's Law
- 4.7 Forces between Multiple charges
- 4.8 Electric Field
- 4.9 Electric Field Lines
- 4.10 Electric Flux
- 4.11 Electric Dipole
- 4.12 Dipole in a uniform external field
- 4.13 Continuous Charge Distribution
- 4.14 Gauss's Law
- 4.15 Application of Gauss' Law (except 4.15.3)
  - 4.15.1 Field due to an infinitely long straight uniformly charged wire
  - 4.15.2 Field due to a uniformly charged infinite plane sheet

## **CHAPTER–5: ELECTROSTATIC POTENTIAL AND CAPACITANCE**

- 5.1 Introduction
- 5.2 Electrostatic Potential
- 5.3 Potential due to a point charge
- 5.4 Potential due to an Electric Dipole
- 5.5 Potential due to a System of Charges
- 5.6 Equipotential Surfaces
- 5.7 Potential Energy of a System of Charges
- 5.8 Potential Energy in an External field
- 5.9 Electrostatics of Conductors
- 5.10 Dielectrics and Polarisation
- 5.11 Capacitors and Capacitance
- 5.12 The Parallel Plate Capacitor
- 5.13 Effect of Dielectric on Capacitance
- 5.14 Combination of Capacitors
- 5.15 Energy Stored in a Capacitor

## **CHAPTER – 6: CURRENT ELECTRICITY**

- 6.1 Introduction
- 6.2 Electric current
- 6.3 Electric current in conductors
- 6.4 Ohm's Law
- 6.5 Drift Electrons and Origin of Resistivity
- 6.6 Limitations of Ohm's Law

- 6.8 Temperature Dependence of Resistivity
- 6.9 Electric Energy, Power
- 6.11 Cells, emf, Internal Resistance
- 6.12 Cells in Series and in Parallel
- 6.13 Kirchoff's Laws
- 6.14 Wheatstone Bridge(**Qualitative treatment only**)
- 6.15 MeterBridge
- 6.16 Potentiometer

## **CHAPTER – 7: MOVING CHARGES AND MAGNETISM**

- 7.1 Introduction
- 7.2 Magnetic Force
- 7.3 Motion in a Magnetic field
- 7.5 Magnetic Field due to a Current Element, Biot-Savart Law
- 7.6 Magnetic Field on the Axis of a Circular Current Loop
- 7.7 Ampere's Circuital Law
- 7.8 The Solenoid and the Toroid
- 7.9 Force between two Parallel Currents, The Ampere(Unit)
- 7.10 Torque on Current Loop, Magnetic Dipole
- 7.11 The Moving Coil Galvanometer

## **CHAPTER – 8: MAGNETISM AND MATTER**

- 8.1 Introduction
- 8.2 The Bar Magnet (**except 8.2.2, 8.2.3**)
  - 8.2.1 The magnetic field lines
  - 8.2.4 The electrostatic analog
- 8.3 Magnetism and Gauss' Law
- 8.4 The Earth's Magnetism
- 8.5 Magnetisation and Magnetic Intensity

## **CHAPTER – 9: ELECTROMAGNETIC INDUCTION**

- 9.1 Introduction
- 9.2 The experiments of Faraday and Henry
- 9.3 Magnetic Flux
- 9.4 Faraday's Law of Induction
- 9.5 Lenz's Law and Conservation of Energy
- 9.6 Motional Electromotive Force
- 9.7 Energy consideration : A Quantitative Study
- 9.8 Eddy Currents
- 9.9 Inductance
- 9.10 AC Generator

## **CHAPTER – 10: ALTERNATING CURRENT :**

- 10.1 Introduction
- 10.2 AC voltage applied to a Resistor
- 10.3 Representation of AC Current and Voltage by Rotating Vectors- Phasors
- 10.4 AC voltage applied to an Inductor
- 10.5 AC voltage applied to a Capacitor
- 10.6 AC voltage applied to a Series LCR Circuit
- 10.8 LC Oscillations(**Qualitative treatment only**)
- 10.9 Transformers

## **CHAPTER – 11: ELECTRO MAGNETIC WAVES**

- 11.1 Introduction
- 11.3 Electro Magnetic Waves (**qualitative treatment only**)
- 11.4 Electromagnetic Spectrum

## **CHAPTER–12: DUAL NATURE OF RADIATION AND MATTER**

- 12.1 Introduction
- 12.2 Electron Emission
- 12.3 Photoelectric Effect
- 12.4 Experimental Study of Photoelectric Effect
- 12.5 Photoelectric Effect and Wave Theory of Light
- 12.6 Einstein's Photoelectric Equation: Energy Quantum of Radiation
- 12.7 Particle Nature of Light : The Photon
- 12.8 Wave Nature of Matter

## **CHAPTER–13: ATOMS**

- 13.1 Introduction
- 13.2 Alpha-particle Scattering and Rutherford's Nuclear model of Atom
- 13.3 Atomic Spectra
- 13.4 Bohr Model of the Hydrogen Atom
- 13.5 The Line Spectra of the Hydrogen Atom
- 13.6 De Broglie's Explanation of Bohr's Second Postulate of Quantization

## **CHAPTER–14: NUCLEI**

- 14.1 Introduction
- 14.2 Atomic Masses and Composition of Nucleus
- 14.3 Size of the Nucleus
- 14.4 Mass Energy and Nuclear Binding Energy (except 14.4.2)
  - 14.4.1 Mass- Energy
- 14.5 Nuclear Force
- 14.7 Nuclear energy

## **CHAPTER–15:**

### **SEMICONDUCTOR ELECTRONICS: MATERIALS, DEVICES AND SIMPLE CIRCUITS**

- 15.1 Introduction
- 15.2 Classification of Metals, Conductors and Semiconductors (**qualitative ideas only**)
- 15.3 Intrinsic Semiconductor
- 15.4 Extrinsic Semiconductor
- 15.5 p – n junction
- 15.6 Semi conductor diode
- 15.7 Application of Junction Diode as a Rectifier
- 15.8 Special Purpose p-n Junction Diodes (except 15.8.1)
  - 15.8.2 Optoelectronic junction devices
- 15.9 Junction Transistor (except 15.9.3, 15.9.4, 15.9.5)
  - 15.9.1 Transistor structure and action
  - 15.9.2 Basic transistor circuit configuration and transistor characteristics
- 15.10 Digital Electronics and Logic Gates
- 15.11 Integrated Circuits

## **CHAPTER– 16: COMMUNICATION SYSTEMS**

- 16.1 Introduction
- 16.2 Elements of communication system
- 16.3 Basic Terminology used in Electronic Communication Systems
- 16.4 Bandwidth of Signals
- 16.5 Bandwidth of Transmission Medium
- 16.6 Propagation of Electromagnetic Waves
- 16.7 Modulation and its Necessity
- 16.8 Amplitude Modulation
- 16.9 Production of Amplitude Modulated Wave
- 16.10 Detection of Amplitude Modulated Wave