

**BOARD OF INTERMEDIATE EDUCATION, A.P., HYDERABAD**  
**INTERMEDIATE II<sup>ND</sup> YEAR PHYSICS SYLLABUS**  
**(W.E.F. 2013 - 14)**

	<b>PERIODS</b>
<b>CHAPTER ONE</b> <b>WAVES</b>	<b>12</b>
1.1 Introduction	
1.2 Transverse and longitudinal waves	
1.3 Displacement relation in a progressive wave	
1.4 The speed of a travelling wave	
1.5 The principle of superposition of waves	
1.6 Reflection of waves	
1.7 Beats	
1.8 Doppler effect	
<b>CHAPTER TWO</b> <b>RAY OPTICS AND OPTICAL INSTRUMENTS</b>	<b>08</b>
2.1 Introduction	
2.2 Reflection of Light by Spherical Mirrors	
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	
2.9 Optical Instruments	
<b>CHAPTER THREE</b> <b>WAVE OPTICS</b>	<b>08</b>
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
- 3.7 Polarisation

## CHAPTER FOUR

### ELECTRIC CHARGES AND FIELDS

12

- 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's Law

## CHAPTER FIVE

### ELECTROSTATIC POTENTIAL AND CAPACITANCE

12

- 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
- 5.16 Van de Graaff Generator

## CHAPTER SIX

### CURRENT ELECTRICITY

12

- 6.1 Introduction
- 6.2 Electric Current
- 6.3 Electric Currents in Conductors
- 6.4 Ohm's law
- 6.5 Drift of Electrons and the Origin of Resistivity
- 6.6 Limitations of Ohm's Law
- 6.7 Resistivity of various Materials
- 6.8 Temperature Dependence of Resistivity
- 6.9 Electrical Energy, Power
- 6.10 Combination of Resistors — Series and Parallel
- 6.11 Cells, emf, Internal Resistance
- 6.12 Cells in Series and in Parallel
- 6.13 Kirchhoff's Laws
- 6.14 Wheatstone Bridge
- 6.15 Meter Bridge
- 6.16 Potentiometer

## CHAPTER SEVEN

### MOVING CHARGES AND MAGNETISM

12

- 7.1 Introduction
- 7.2 Magnetic Force
- 7.3 Motion in a Magnetic Field
- 7.4 Motion in Combined Electric and Magnetic Fields
- 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
- 7.10 Torque on Current Loop, Magnetic Dipole
- 7.11 The Moving Coil Galvanometer



## CHAPTER EIGHT

### MAGNETISM AND MATTER

08

- 8.1 Introduction
- 8.2 The Bar Magnet
- 8.3 Magnetism and Gauss's Law
- 8.4 The Earth's Magnetism
- 8.5 Magnetisation and Magnetic Intensity
- 8.6 Magnetic Properties of Materials
- 8.7 Permanent Magnets and Electromagnets

## CHAPTER NINE

### ELECTROMAGNETIC INDUCTION

16

- 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 TEN

### ALTERNATING CURRENT

08

- 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
- 10.7 Power in AC Circuit: The Power Factor
- 10.8 LC Oscillations
- 10.9 Transformers



**CHAPTER ELEVEN**  
**ELECTROMAGNETIC WAVES**

08

- 11.1 Introduction
- 11.2 Displacement Current
- 11.3 Electromagnetic Waves
- 11.4 Electromagnetic Spectrum

14  
14  
14  
14

CH  
SEN

**CHAPTER TWELVE**  
**DUAL NATURE OF RADIATION AND MATTER**

08

- 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
- 12.9 Davisson and Germer Experiment

15  
15  
15  
15  
15  
15  
15  
15  
15

**CHAPTER THIRTEEN**  
**ATOMS**

08

- 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 Quantisation

CH  
CON  
16.  
16.  
16.  
16.  
16.  
16.  
16.  
16.  
16.  
16.  
16.

**CHAPTER FOURTEEN**  
**NUCLEI**

08

- 14.1 Introduction
- 14.2 Atomic Masses and Composition of Nucleus
- 14.3 Size of the Nucleus

16.