

Revised Syllabus For the Academic Year 2020 -2021

Subject : Physics

Class : XII

Theory Component

Max. Marks: 70

Sr. No.	Chapter	Marks
1	Electric Charges and Fields	05
2	Electrostatic Potential and Capacitance	05
3	Current Electricity	08
4	Moving Charges and Magnetism	06
5	Magnetism and Matter	04
6	Electromagnetic Induction	04
7	Alternating Current	05
8	Electromagnetic Waves	03
9	Ray Optics and Optical Instruments	08
10	Wave Optics	05
11	Dual Nature of Matter and Radiation	03
12	Atoms	04
13	Nuclei	03
14	Semiconductor Electronics : Materials, Devices and simple circuits	07
		70

Practical Component

Max. Marks: 20

1. At least **8** experiments to be performed (**four** from each section)
2. At least **6** activities to be demonstrated by the teacher (**three** from each section)
3. No investigatory Project

Revised Theory portion

(Sections are according to the new print 2020-21 of NCERT books)

CHAPTER ONE :- ELECTRIC CHARGES AND FIELDS		
Section		Remarks
1.1	Introduction	Reading
1.2	ELECTRIC CHARGE	No questions on historical importance
1.3	CONDUCTORS AND INSULATORS	Qualitative ideas only
1.4	CHARGING BY INDUCTION	Qualitative ideas only
1.5	BASIC PROPERTIES OF ELECTRIC CHARGE	
1.6	COULOMB'S LAW	Vector treatment not necessary
1.7	FORCES BETWEEN MULTIPLE CHARGES	
1.8	ELECTRIC FIELD	Qualitative ideas only
1.9	ELECTRIC FIELD LINES	
1.10	ELECTRIC FLUX	
1.11	ELECTRIC DIPOLE	
1.12	DIPOLE IN A UNIFORM EXTERNAL FIELD	
1.13	CONTINUOUS CHARGE DISTRIBUTION	Qualitative ideas only
1.14	GAUSS'S LAW	
1.15	APPLICATIONS OF GAUSS'S LAW	1.15.3 - Deleted :- uniformly charged thin spherical shell (field inside and outside).
CHAPTER TWO ELECTROSTATIC POTENTIAL AND CAPACITANCE		
2.1	Introduction	Qualitative ideas only
2.2	ELECTROSTATIC POTENTIAL	
2.3	POTENTIAL DUE TO A POINT CHARGE	
2.4	POTENTIAL DUE TO AN ELECTRIC DIPOLE	Derivation not for evaluation but formulas are included for numerical problems
2.5	POTENTIAL DUE TO A SYSTEM OF CHARGES	
2.6	EQUIPOTENTIAL SURFACES	
2.7	POTENTIAL ENERGY OF A SYSTEM OF CHARGES	
2.8	POTENTIAL ENERGY IN AN EXTERNAL FIELD	
2.9	ELECTROSTATICS OF CONDUCTORS	
2.10	DIELECTRICS AND POLARISATION	
2.11	CAPACITORS AND CAPACITANCE	
2.12	THE PARALLEL PLATE CAPACITOR	
2.13	EFFECT OF DIELECTRIC ON	

	CAPACITANCE	
2.14	COMBINATION OF CAPACITORS	
2.15	ENERGY STORED IN A CAPACITOR	
CHAPTER THREE CURRENT ELECTRICITY		
3.1	Introduction	Qualitative ideas only
3.2	ELECTRIC CURRENT	
3.3	ELECTRIC CURRENTS IN CONDUCTORS	
3.4	OHM'S LAW	
3.5	DRIFT OF ELECTRONS AND THE ORIGIN OF RESISTIVITY	Derivation not for evaluation and formulas included for numerical problems
3.6	LIMITATIONS OF OHM'S LAW	
3.7	RESISTIVITY OF VARIOUS MATERIALS	Deleted:- Carbon resistors, colour code for carbon resistors
3.8	TEMPERATURE DEPENDENCE OF RESISTIVITY	
3.9	ELECTRICAL ENERGY, POWER	
3.10	COMBINATION OF RESISTORS – SERIES AND PARALLEL	Deleted:- series and parallel combinations of resistors
3.11	CELLS, EMF, INTERNAL RESISTANCE	
3.12	CELLS IN SERIES AND IN PARALLEL	
3.13	KIRCHHOFF'S RULES	Simple applications and limited to two variable numerical problems
3.14	WHEATSTONE BRIDGE	
3.15	METER BRIDGE	
3.16	POTENTIOMETER	
CHAPTER FOUR MOVING CHARGES AND MAGNETISM		
4.1	Introduction	Qualitative ideas only
4.2	MAGNETIC FORCE	
4.3	MOTION IN A MAGNETIC FIELD	
4.4	MOTION IN COMBINED ELECTRIC AND MAGNETIC FIELD	4.4.1 - Vector treatment not necessary and Flemings LH Rule can be used 4.4.2 - DELETED:- Cyclotron
4.5	MAGNETIC FIELD DUE TO A CURRENT ELEMENT, BIOT-SAVART LAW	
4.6	MAGNETIC FIELD ON THE AXIS OF A CIRCULAR CURRENT LOOP	
4.7	AMPERE'S CIRCUITAL LAW	

4.8	THE SOLENOID AND THE TOROID	Derivation not for evaluation and formulas included for numerical problems
4.9	FORCE BETWEEN TWO PARALLEL CURRENTS, THE AMPER	
4.10	TORQUE ON CURRENT LOOP, MAGNETIC DIPOLE	4.10.2- Qualitative ideas only 4.10.3 – Derivation not for evaluation but formulas are included for numerical problems
4.11	THE MOVING COIL GALVANOMETER	Derivations of conversion of galvanometer into ammeter and voltmeter are not included for evaluation but formulas are included for numerical problems
Chapter FIVE MAGNETISM AND MATTER		
5.1	INTRODUCTION	No questions on historical importance and Qualitative ideas only
5.2	THE BAR MAGNET	5.2.1 - Qualitative ideas only 5.2.2 & 5.2.4 –Deleted:- magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis 5.2.3 -Deleted:- torque on a magnetic dipole (bar magnet) in a uniform magnetic field
5.3	MAGNETISM AND GAUSS'S LAW	
5.4	THE EARTH'S MAGNETISM	No question on angle between axis of the earths (hypothetical) magnetic dipole and the axis of rotation of the earth.
5.5	MAGNETISATION AND MAGNETIC INTENSITY	Derivation not for evaluation and formulas are included for numerical problems
5.6	MAGNETIC PROPERTIES OF MATERIALS	Deleted:- Para-, dia- and ferro - magnetic substances, with examples
5.7	PERMANENT MAGNETS AND ELECTROMAGNETS	Deleted:- Electromagnets and factors affecting their strengths, permanent magnets.
CHAPTER SIX ELECTROMAGNETIC INDUCTION		
Section		Remarks
6.1	Introduction	No questions on historical importance
6.2	The Experiments of Faraday and Henry	
6.3	Magnetic Flux	
6.4	Faraday's Law of Induction	
6.5	Lenz's Law and Conservation of Energy	
6.6	Motional Electromotive Force	
6.7	Energy Consideration: A Quantitative Study	Derivation not for evaluation but formulas are included for numerical problems
6.8	Eddy Currents	
6.9	Inductance (Self & Mutual)	Derivation not for evaluation but formulas are included for numerical problems
6.10	AC Generator	

CHAPTER SEVEN ALTERNATING CURRENT		
Section		Remarks
7.1	Introduction	No questions on historical importance
7.2	AC Voltage Applied to Resistor	
7.3	Representation of AC Current and Voltage by Rotating Vectors - Phasors	
7.4	AC Voltage Applied to Inductor	
7.5	AC Voltage Applied to Capacitor	
7.6	AC Voltage Applied to a Series LCR Circuit	Analytical solution (excluded). Sharpness for resonance (reading)
7.7	Power in AC Circuit	Deleted:- power factor, wattless current
7.8	LC Oscillations	Qualitative treatment only
7.9	Transformers	
CHAPTER EIGHT ELECTROMAGNETIC WAVES		
Section		Remarks
8.1	Introduction	No questions on historical importance
8.2	Displacement Current	Deleted:- Basic idea of displacement current.
8.3	Electromagnetic Waves	Qualitative ideas only with formulas included for numerical problems
8.4	Electromagnetic Spectrum	
CHAPTER NINE RAY OPTICS AND OPTICAL INSTRUMENTS		
Section		Remarks
9.1	Introduction	No questions on historical importance
9.2	Reflection of Light by Spherical Mirrors	Deleted:- reflection of light, spherical mirrors. Qualitative ideas of mirror formula without derivation.
9.3	Refraction	
9.4	Total Internal Reflection	
9.5	Refraction at Spherical Surfaces and by Lenses	
9.6	Refraction through a Prism	
9.7	Dispersion by a Prism	
9.8	Some Natural Phenomena due to Sunlight	Deleted:- 9.8.2 Scattering of Light – blue colour of sky and reddish appearance of the sunrise and sunset.
9.9	Optical Instruments	
CHAPTER TEN WAVE OPTICS		
Section		Remarks
10.1	Introduction	No questions on historical importance
10.2	Huygens Principle	

10.3	Refraction and Reflection of Plane Waves using Huygens Principle	
10.4	Coherent and Incoherent Addition of Waves	
10.5	Interference of Light Waves and Young's Experiment	
10.6	Diffraction	Deleted:- 10.6.3 - Resolving power of microscope and astronomical telescope
10.7	Polarisation	Deleted:- Polarisation, plane polarised light, Brewster's Law, uses of plane polarised light and Polaroids.
CHAPTER ELEVEN		
DUAL NATURE OF RADIATION AND MATTER		
Section		Remarks
11.1	Introduction	No questions on historical importance
11.2	Electron Emission	
11.3	Photoelectric Effect	11.3.1 & 11.3.2 qualitative ideas only
11.4	Experimental Study of Photoelectric Effect	
11.5	Photoelectric Effect and Wave Theory of Light	
11.6	Einstein's Photoelectric Equation: Energy Quantum of Radiation	
11.7	Particle Nature of Light: The Photon	
11.8	Wave Nature of Matter	No questions on historical importance in relation to Heisenberg's <i>uncertainty principle</i>
11.9	Davisson and Germer Experiment	Deleted:- Davisson-Germer experiment
CHAPTER TWELVE		
ATOMS		
12.1	Introduction	No questions to be asked the on historical importance
12.2	Alpha-particle Scattering and Rutherford's Nuclear Model of Atom	
12.3	Atomic Spectra	
12.4	Bohr Model of the Hydrogen Atom	
12.5	The Line Spectra of the Hydrogen Atom	
12.6	DE Broglie's Explanation of	

	Bohr's Second Postulate of Quantisation	
CHAPTER THIRTEEN NUCLEI		
13.1	Introduction	
13.2	Atomic Masses and Composition of Nucleus	No questions on historical importance of the discovery of the neutron
13.3	Size of the Nucleus	
13.4	Mass-Energy and Nuclear Binding Energy	Deleted:- Binding energy per nucleon and its variation with mass number
13.5	Nuclear Force	Qualitative ideas only
13.6	Radioactivity	Deleted:- Radioactivity, alpha, beta and gamma particles/rays and their properties; radioactivedecay law, half life and mean life
13.7	Nuclear Energy	13.7.2 -No drawing diagram of Nuclear reactor 13.7.4 - Qualitative ideas only
CHAPTER FOURTEEN SEMICONDUCTOR ELECTRONICS: MATERIALS, DEVICES AND SIMPLE CIRCUITS		
14.1	Introduction	
14.2	Classification of Metals, Conductors and Semiconductors	
14.3	Intrinsic Semiconductor	Only qualitative ideas on lattice structure shown in figure 14.3
14.4	Extrinsic Semiconductor	
14.5	p-n Junction	
14.6	Semiconductor Diode	
14.7	Application of Junction Diode as a Rectifier	
14.8	Special Purpose p-n Junction Diodes	Deleted:- 14.8.1 Zener diode and their characteristics, zener diode as a voltage regulator.
14.9	Digital Electronics and Logic Gates	

