

SYLLABUS 2020-2021

CLASS: 12

SUBJECT: PHYSICS

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2. Current Electricity	<ul style="list-style-type: none">2.1 Electric Current<ul style="list-style-type: none">2.1.1 Conventional Current2.1.2 Drift Velocity2.1.3 Microscopic model of current2.2 Ohm's Law<ul style="list-style-type: none">2.2.1 Resistivity2.2.2 Resistors in Series and Parallel2.2.3 Colour code for carbon resistors2.2.4 Temperature dependence of resistivity2.3 Energy and power in electrical circuits<ul style="list-style-type: none">2.4.1 Electromotive force and internal resistance2.4.2 Determination of internal resistance2.4.3 Cells in series2.4.4 Cells in Parallel2.5.1 Kirchhoff's First rule2.5.2 Kirchhoff's Second rule2.5.3 Wheatstone's bridge2.5.4 Metre bridge2.5.7 Measurement of internal resistance of cell by Potentiometer2.7 Thermo electric current<ul style="list-style-type: none">2.7.1 Seebeck effect2.7.2 Peltier Effect2.7.3 Thomson effect
3. Magnetism and magnetic effects of electric current	<ul style="list-style-type: none">3.1 Introduction<ul style="list-style-type: none">3.1.2 Basic properties of magnets3.2 Coulomb's inverse square law of magnetism3.8 Biot - Savart law<ul style="list-style-type: none">3.8.1 Definition and explanation of Biot - Savart law3.8.2 Magnetic field due to long straight conductor carrying current3.8.3 Magnetic field produced along the axis of the current carrying circular coil3.8.5 Current loop as a magnetic dipole3.9 Ampere Circuital law<ul style="list-style-type: none">3.9.1 Ampere's circuital law3.9.2 Magnetic field due to the current carrying wire of infinite length using Ampere's law

	<ul style="list-style-type: none">3.9.3 Magnetic field due to a long current carrying solenoid3.10 Lorentz force3.10.1 Force on a moving charge in a magnetic field3.10.2 Motion of a charged particle in a uniform magnetic field3.10.3 Motion of a charged particle under crossed electric and magnetic field (velocity selector)3.10.5 Force on a current carrying conductor placed in a magnetic field3.10.6 Force between two long parallel current carrying conductors3.11.2 Moving coil galvanometer
4. Electromagnetic Induction and Alternating current	<ul style="list-style-type: none">4.1 Electromagnetic Induction4.1.1 Introduction4.1.2 Magnetic Flux (Φ_B)4.1.5 Fleming's right hand rule4.1.6 Motional emf from Lorentz force4.3 Self-Induction4.3.1 Introduction4.3.2 Self-inductance of a long solenoid4.3.3 Mutual Induction4.3.4 Mutual Inductance between two long co-axial solenoids4.4 Methods of producing induced emf4.4.1 Introduction4.4.2 Production of induced emf by changing the magnetic field4.4.3 Production of induced emf by changing the area of the coil4.4.4 Production of induced emf by changing relative orientation of the coil with the magnetic field4.6 Transformer4.6.1 Construction and working of transformer4.6.2 Energy losses in Transformer4.6.3 Advantages of AC in long distance power transmission.4.7 Alternating Current4.7.1 Introduction

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7. Wave optics	<ul style="list-style-type: none">7.1 Theories on light<ul style="list-style-type: none">7.1.1 Corpuscular theory7.1.2 Wave theory7.1.3 Electromagnetic wave theory7.1.4 Quantum theory7.2 Wave nature of light<ul style="list-style-type: none">7.2.1 wave optics7.2.2 Huygens' principle

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	7.2.4	Proof for laws of refraction using Huygens principle
	7.3	Interference
	7.3.1	Phase difference and path difference
	7.3.2	Coherent Sources
	7.3.3	Double slit as coherent source
	7.3.4	Young's double slit experiment
	7.3.5	Interference in white light (polychromatic light)
	7.3.6	Interference in thin films
	7.4	Diffraction
	7.4.2	Diffraction in single slit
	7.4.4	Fresnel's distance
	7.4.5	Difference between interference and diffraction
	7.4.9	Resolution
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	7.5.3.2	Plane and partially polarised light
	7.5.3.3	Malus law
	7.5.3.4	Uses of polaroids
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	7.5.4.1	Brewster's law
	7.5.4.2	Pile of plates
	7.6	Optical instruments
	7.6.1	Simple microscope
	7.6.1.1	Near Point focusing
	7.6.1.2	Normal focusing
	7.6.1.3	Resolving Power of Microscope
	7.6.1.4	Resolving Power of telescope
	7.6.2	Compound microscope
	7.6.3	Astronomical telescope
	7.6.3.1	Magnification in astronomical telescope
	7.6.5	Reflecting telescope
	7.6.7.3	Astigmatism

8. Dual nature of radiation and mater	<ul style="list-style-type: none">8.1 Introduction8.1.1 Electron Emission8.2 Photo Electric Effect<ul style="list-style-type: none">8.2.1 HERTZ, Hallwach and Lenards's Observation8.2.2 Effect of intensity of incident Light on Photo Electric current8.2.3 Effect of Potential Difference on Photo Electric current8.2.4 Effect of Frequency on Incident Light on stopping potential8.2.5 Laws of Photo Electric current8.2.6 Concept of Quantization of Energy8.2.7 Particle Nature of light - Einstein Explanation8.2.8 Photo Electric cells and their Applications8.3 Matter waves<ul style="list-style-type: none">8.3.1 Introduction wave Nature of Particles8.3.2 De - Broglie wavelength8.3.3 De Broglie wavelength of electron8.3.4 Davisson - Germer Experiment8.3.5 Electron Microscope8.4 X - ray Spectra Continuous X Ray Spectra, Characteristic X Ray Spectra
9. Atomic and nuclear physics	<ul style="list-style-type: none">9.1 Introduction9.2 Electric Discharge Through gases Properties of Cathode Rays<ul style="list-style-type: none">9.2.1 Determination of Specific Charge (e/m) of electron - Thomsons experiment9.2.2 Determination of charge of electron -Millikan's Oil Drop Experiment9.3.2 Ruther ford Model9.3.3 Bohr atom model9.3.4 Atomic Structure9.4.3 Atomic and Nuclear masses9.4.4 Size and density of Nucleus9.4.5 Mass Defects and Binding energy9.4.6 Binding Energy9.5 Nuclear Force9.6.1 Alpha decay

	<p>9.6.2 Beta Decay 9.6.3 Gamma Emission 9.6.4 Laws of Radioactivity 9.6.5 Half Life, Mean life 9.6.6 Carbon dating 9.7 Nuclear fission 9.8 Nuclear fusion</p>
<p>10. Electronics and communication systems</p>	<p>10.1 Introduction 10.1.1 Energy Band Diagram 10.1.2 Classification of materials 10.2 Types of Semi conductors 10.2.1 Intrinsic Semiconductor 10.2.2 Extrinsic Semi conductor 10.3.1 PN Junction Formation 10.3.2 PN Junction Diode 10.3.4 Rectification 10.3.5 Breakdown Mechanism 10.3.6 Zener Diode 10.4 The Bipolar Junction transistor 10.4.1 Transistor circuit Configuration 10.4.2 Transistor action in CB mode 10.4.3 Relation between α and β 10.4.4 Operating point 10.4.5 Transistor as a switch 10.5 Digital Electronics 10.5.1 Analog and digital signal 10.6 Boolean Algebra 10.7 De Morgans Theorem 10.7.1 De Morgans 1st Theorem 10.7.2 De Morgans 2nd Theorem 10.7.3 Integrated chips 10.8 Communication System 10.9 Modulation 10.9.1 Amplitude modulation 10.9.2 Frequency modulation 10.9.3 Phase modulation</p>

11. Recent developments in physics	11.1	Introduction
	11.2	Nano science and Nano technology
	11.2.1	Nano Science
	11.2.2	Interdisciplinary nature of nanotechnology
	11.2.3	Nano in nature
	11.3	Robotics
	11.3.1	What is Robotics ?
	11.3.2	Components of robotics
	11.3.3	Types of Robotics
	1.	
	2.	
	3.	
	4.	
	5.	
	6.	

PRACTICALS	
CLASS: 12	SUBJECT: PHYSICS
Sl.No	Topic
1	Determine the value of the Horizontal component of the earth magnetic field using tangent galvanometer. Take atleast four readings.
2	Compare the emf of two cells using potentiometer.
3	Adjust the grating for normal incidence using the spectrometer. Determine the wavelength of green, blue, yellow and red lines of mercury spectrum(the number of lines per metre length of the grating can be noted from the grating).
4	Voltage - current characteristics of a PN junction diode.
5	Verification of truth tables of logic gates using integrated circuits.
6	Verification of De morgan's Theorems.