Board of Intermediate Education, Andhra Pradesh.

Intermediate – II Year Syllabus w.e.f. 2013 – 14

Subject : PHYSICS - II

S. No.		Topics	Page No.
1.	WAV	ES	
	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	
2.	RAY	OPTICS AND OPTICAL INSTRUMENTS	
	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	
3.	WAV	E 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	
	3.7	Polarisation	
4.		TRIC 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	•	
	4.14	-	
	4.15	Application of Gauss's Law	
	1.13	Application of dauss's Law	

5.	ELEC.	TROSTATIC 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	·	
	5.15	'	
	5.16	Van de Graaff Generator	
6.		RENT ELECTRICITY	
	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	
7.	MOV	ING CHARGES AND MAGNETISM	
	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	
8.		NETISM AND MATTER	
	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	
9.		TROMAGNETICINDUCTION	
	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	
10.	ALTE	RNATING CURRENT	
	10.1		
	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		
	10.9	Transformers	
11.	_	TROMAGNETIC WAVES	
	11.1	INTRODUCTION	
	11.2	Displacement Current	
	11.3	Electromagnetic Waves	
	11.4	Electromagnetic Spectrum	
12.	_	L NATURE OF RADIATION ANDMATTER	
	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	
13.	ATON		
	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	
	13.5	DE Broglie's Explanation of Bohr's Second Postulate of Quantisation	
14.	NUCL		
14.	14.1	INTRODUCTION	
	14.2 14.3	·	
	14.3	Size of the Nucleus	

	14.4 Mass-Energy and Nuclear Binding Energy	
	14.5 Nuclear Force	
	14.6 Radioactivity	
	14.7 Nuclear Energy	
15.	SEMICONDUCTORELECTRONICS:	
	MATERIALS, DEVICES AND SIMPLE CIRCUITS	
	15.1 INTRODUCTION	
	15.2 Classification of Metals, Conductors and Semiconductors	
	15.3 Intrinsic Semiconductor	
	15.4 Extrinsic Semiconductor	
	15.5 p-n Junction	
	15.6 Semiconductor diode	
	15.7 Application of Junction Diode as a Rectifier	
	15.8 Special Purpose p-n Junction Diodes	
	15.9 Junction Transistor	
	15.10 Digital Electronics and Logic Gates	
	15.11 Integrated Circuits	
16.	COMMUNICATION SYSTEMS	
	16.1 INTRODUCTION	
	16.2 Elements of a Communication System	
	16.3 Basic Terminology Used in Electronic Communication Systems	
	16.4 Bandwidth of Signals	
	16.5 Bandwidth of Transmission Medium	
	10 C Duana action of Floatwane and in May 100	
	16.6 Propagation of Electromagnetic Waves	
	16.7 Modulation and its Necessity	
	16.7 Modulation and its Necessity 16.8 Amplitude Modulation	
	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave	
	16.7 Modulation and its Necessity 16.8 Amplitude Modulation	
	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave	
	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under	
	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave	•
1.	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under	9 24 - 26
	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations	24 - 26
1.	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical	24 - 26 40 - 45,
	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical mirrors, the mirror equation. Scattering of light reddish appearance of the	24 - 26
	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical	24 - 26 40 - 45,
	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical mirrors, the mirror equation. Scattering of light reddish appearance of the	24 - 26 40 – 45, 63 - 65
2.	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical mirrors, the mirror equation. Scattering of light reddish appearance of the sun at sunrise and sunset and blue colors of sky.	24 - 26 40 – 45, 63 - 65
2.	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical mirrors, the mirror equation. Scattering of light reddish appearance of the sun at sunrise and sunset and blue colors of sky. Wave Optics —	24 - 26 40 – 45, 63 - 65
2.	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical mirrors, the mirror equation. Scattering of light reddish appearance of the sun at sunrise and sunset and blue colors of sky. Wave Optics — Diffraction: Resolving power of optical instruments (microscope and	24 - 26 40 - 45, 63 - 65
2.	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical mirrors, the mirror equation. Scattering of light reddish appearance of the sun at sunrise and sunset and blue colors of sky. Wave Optics — Diffraction: Resolving power of optical instruments (microscope and astronomical telescope)	24 - 26 40 – 45, 63 - 65
2.	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical mirrors, the mirror equation. Scattering of light reddish appearance of the sun at sunrise and sunset and blue colors of sky. Wave Optics — Diffraction: Resolving power of optical instruments (microscope and astronomical telescope) Polarisation: Polarisation of reflection (Brewster's law) plane polarized light	24 - 26 40 - 45, 63 - 65 99 - 114
3.	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical mirrors, the mirror equation. Scattering of light reddish appearance of the sun at sunrise and sunset and blue colors of sky. Wave Optics — Diffraction: Resolving power of optical instruments (microscope and astronomical telescope) Polarisation: Polarisation of reflection (Brewster's law) plane polarized light (uses) polaroids, polarization by scattering.	24 - 26 40 - 45,
2. 3.	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical mirrors, the mirror equation. Scattering of light reddish appearance of the sun at sunrise and sunset and blue colors of sky. Wave Optics — Diffraction: Resolving power of optical instruments (microscope and astronomical telescope) Polarisation: Polarisation of reflection (Brewster's law) plane polarized light (uses) polaroids, polarization by scattering. Electric Charges and Fields - Application of Gauss's law: Field due to uniformly charged thin spherical shell (field inside and outside)	24 - 26 40 - 45, 63 - 65 99 - 114
3.	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical mirrors, the mirror equation. Scattering of light reddish appearance of the sun at sunrise and sunset and blue colors of sky. Wave Optics — Diffraction: Resolving power of optical instruments (microscope and astronomical telescope) Polarisation: Polarisation of reflection (Brewster's law) plane polarized light (uses) polaroids, polarization by scattering. Electric Charges and Fields - Application of Gauss's law: Field due to uniformly charged thin spherical shell (field inside and outside) Current Electricity - Colour code for carbon resistors, series and parallel	24 - 26 40 - 45, 63 - 65 99 - 114
2. 3.	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical mirrors, the mirror equation. Scattering of light reddish appearance of the sun at sunrise and sunset and blue colors of sky. Wave Optics — Diffraction: Resolving power of optical instruments (microscope and astronomical telescope) Polarisation: Polarisation of reflection (Brewster's law) plane polarized light (uses) polaroids, polarization by scattering. Electric Charges and Fields - Application of Gauss's law: Field due to uniformly charged thin spherical shell (field inside and outside)	24 - 26 40 - 45, 63 - 65 99 - 114
2. 3.	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical mirrors, the mirror equation. Scattering of light reddish appearance of the sun at sunrise and sunset and blue colors of sky. Wave Optics — Diffraction: Resolving power of optical instruments (microscope and astronomical telescope) Polarisation: Polarisation of reflection (Brewster's law) plane polarized light (uses) polaroids, polarization by scattering. Electric Charges and Fields - Application of Gauss's law: Field due to uniformly charged thin spherical shell (field inside and outside) Current Electricity - Colour code for carbon resistors, series and parallel	24 - 26 40 - 45, 63 - 65 99 - 114 155 - 163 229 - 331
 3. 4. 6. 	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical mirrors, the mirror equation. Scattering of light reddish appearance of the sun at sunrise and sunset and blue colors of sky. Wave Optics — Diffraction: Resolving power of optical instruments (microscope and astronomical telescope) Polarisation: Polarisation of reflection (Brewster's law) plane polarized light (uses) polaroids, polarization by scattering. Electric Charges and Fields - Application of Gauss's law: Field due to uniformly charged thin spherical shell (field inside and outside) Current Electricity - Colour code for carbon resistors, series and parallel Combinations of resistors	24 - 26 40 - 45, 63 - 65 99 - 114
 3. 4. 7. 	16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave Topics deleted under 30% reduction of Syllabus due to COVID-19 Waves - Doppler effected and its two situations Ray Optics and Optical Instruments - Reflection of light by spherical mirrors, the mirror equation. Scattering of light reddish appearance of the sun at sunrise and sunset and blue colors of sky. Wave Optics — Diffraction: Resolving power of optical instruments (microscope and astronomical telescope) Polarisation: Polarisation of reflection (Brewster's law) plane polarized light (uses) polaroids, polarization by scattering. Electric Charges and Fields - Application of Gauss's law: Field due to uniformly charged thin spherical shell (field inside and outside) Current Electricity - Colour code for carbon resistors, series and parallel Combinations of resistors Moving charges and magnetism - Cyclofron	24 - 26 40 - 45, 63 - 65 99 - 114 155 - 163 229 - 331 266 - 268

	properties of materials (Para, dia and ferro) and its examples, permanent magnets and electromagnets.	
10.	Alternating Current-Power in AC circuit—The power factor, wattles current	392
11.	Electromagnetic waves - Displacement current	412
12.	Dual natural of Radiation and matter - Davisson and Germer experiment	449-450
14.	Nuclei - Radio activity (alpha, beta and gamma particles and their properties) Law of radio active decay, half life and mean life of a Radioactive material, Binding energy per nucleon and its variation with mass number.	496
15.	Semi conductor electronics: materials, devices and simple circuits Purpose of P-N junction diode 1. Zener diode and their characteristics 2. Zener diode as a voltage regulators.	530 – 538