Physics

BOARD OF INTERMEDIATE EDUCATION::A.P::NAMPALLY::HYDERABAD
Revised Syllabus in Physics for II Year Intermediate 2008-09

Topic and Sub - Topics	Periods	Remarks
1	2	3
CHAPTER - 1 ✳		
WAVE MOTION:		
1.1 Longitudinal and transverse waves, Equation for a progressive wave, principle of superposition of waves, reflection of waves.	02	
1.2 Formation of waves on a stretched string, laws of vibrating strings, experimental verification by Sonometer.	02	
1.3 Sound: Characteristics of sound – speed of sound in solids, liquids and gases (only formula to be given), Forced Vibrations – Free Vibrations – Resonance with examples, Standing waves in Organ Pipes - Open Pipes, Closed Pipes, Fundamental frequency, Overtones, harmonics, definition and explanation, Beats definition and their importance.	04	
1.4 Doppler Effect: Definition, derivation of relation for apparent frequency of a sound note emitted by source for the cases a) only source is moving b) only listener is moving c) both source and listener are moving. Applications and limitations of Doppler Effect.	03	
1.5 Echoes, Absorption of sound waves, Reverberation – Reverberation Time - Fundamentals of building Accoustics – Statement of Sabines Law	03	
TOTAL	**14**	
CHAPTER -2 ✳		
OPTICS:		
2.1 Nature of Light – Newton's Corpuscular Theory – Huygens' Wave Theory – Electromagnetic Waves – Electro magnetic spectrum.	01	
2.2 Huygens' explanation of Reflection and Refraction of plane waves at a plane surface.	02	
2.3 Refraction through prism – Derivation of Refractive index of material of prism for minimum deviation, critical angle, Total Internal Reflection – Relation between Critical Angle and Refractive Index, application of total internal reflection to optical fibers.	04	

2.4 Defects in Images: Spherical and Chromatic aberration and reducing these defects – Different methods (qualitative treatment)	03	
2.5 Optical Instruments: Microscope – Telescope – Formula for magnification of Microscope Astronomical and Terrestrial Telescope.	02	
2.6 Construction of Ramsden's and Huygen's eye pieces with ray diagrams.	02	
2.7 Dispersion of light – dispersive power – pure and impure spectra – condition for obtaining pure spectrum – different kinds of spectra – Emission spectra – Line, Band and continuous spectra, absorption spectra. Significance of emission and absorption spectra, Faraunhofer lines and their significance	05	
TOTAL	**19**	
CHAPTER -3 ✳		
PHYSICAL OPTICS:		
3.1 Interference - condition for Interference, Young's Double slit experiment – Derivation for Intensity and fringe width –Uses of Interference.	03	
3.2 Diffraction:		
Fresnel and Faraunhofer diffraction (Qualitative only).	02	
3.3 Polarisation:		
Concepts of Polarisation. Plane Polarisation of Light by Reflection, Refraction and Double Refraction (Polaroids)	03	
TOTAL	**08**	
CHAPTER - 4 ✳		
MAGNETISM:		
4.1 Coulomb's Inverse Square – Definition of Magnetic Field – Magnetic Lines of Force – Uniform and non-Uniform Magnetic Fields.	01	
4.2 Couple acting on a bar magnet placed in a uniform magnetic field. Definition of magnetic moment of magnet.	01	

4.3 Magnetic Induction due to a bar magnet on axial and equatorial lines.	02	
4.4 Superposition of magnetic fields - Tangent Law – Deflection Magnetometer.	02	
4.5 Comparison of Magnetic Moments in Tan A, Tan B positions by equal distance method and Null Method. Verification of Inverse Square Law	02	
4.6 Vibration Magnetometer Principle and Description: Experimental determination of M and B_H earth's horizontal component using Vibration Magnetometer.	02	
4.7 Type of magnetic materials - Para, Dia, and Ferro Magnetism – Definition and properties	02	
TOTAL	**12**	
CHAPTER 5 ✳		
ELECTROSTATICS:		
5.1 Charges - conservation of charge and additive property of charges.	01	
5.2 Coulomb's Law: Permitivity of Free Space and Permitivity of Medium – Force between two point charges.	01	
5.3 Force due to multiple charges – Principle of Supersposition with examples	01	
5.4 Electric field – Electric lines of force their properties – Electric intensity definition – Electric Intensity due to isolated charge and due to multiple charges.	02	
5.5 Electrostatic Potential – Definition of Electrostatic Potential in an electric field – Potential due to single charge – multiple charge – Electrostatic potential energy – Relation between electrostatic potential and electric intensity	03	
5.6 Electric Flux - : Gauss Law: Electric Flux Definition – Gauss Law – Statement of Gauss Law – Application of Gauss Law to find electric intensity and electrostatic Potential due to continuous charge distribution of Infinite Long wire, Infinite Plane Sheet and Spherical Shell.	03	
5.7 Capacitance – Definition of Electrical Capacity of a Conductor – Capacitance – Dielectric constant – Definition of Condenser, its uses – Parallel plate Condenser – formula for Capacitance of Parallel Plate Condenser Di-electric – Dielectric Strength – Effect of dielectric on capacitance of capacitors.	02	

5.8 Capacitors in series and in parallel – derivation of the equivalent capacitance for the above cases	01	
5.9 Energy stored in a Condenser – Effect of dielectric on Energy of Condenser – Types of capacitors – their uses.	03	
TOTAL	**17**	
CHAPTER - 6 ✳		
CURRENT ELECTRICITY:		
6.1 Electric current – Flow of Electric charges in a metallic conductor – Drift velocity and mobility – Relation between electric current and drift velocity.	02	
6.2 Ohm's Law: Statement – Ohmic and Non Ohmic elements with examples – Conductance – Specific resistance – Variation of resistivity with temperature – Variation of Resistance with temperature. Thermistor	03	
6.3 E.M.F. of Cell – Internal resistance and back E.M.F. – Difference between EMF of a Cell and potential difference.	01	
6.4 Electrical energy – Power definition of KWhr.	01	
6.5 Kirchoff's laws: Statement of Kirchoff's voltage law – Krichoff's current law – Application to wheatstone bridge – condition for balancing – Meter Bridge – Determination of resistance of a conductor using meter bridge	03	
6.6 Principle of Potentiometer determination of internal resistance and E.M.F. of a cell using potentiometer.	02	
6.7 Series and parallel combination of cells - Derivation of equivalent E.M.F. for the above cases	01	
TOTAL	**13**	
CHAPTER - 7 ✳		
THERMO-ELECTRICITY		
Introduction, Seebeck effect, Peltier and Thomson effects and their coefficients, variation of thermo e.m.f with temperatures – Neutral and Inversion Temperatures – Applications of Thermo Couple.	06	
TOTAL	**06**	

CHAPTER - 8 ✳ **ELECTRO MAGNETICS:**		
8.1 Oersted's Experiment – Biot-Savart Law – Amperes Law – Magnetic field near a long straight wire and magnetic field at the Center of a circular coil carrying current (with derivations). Field on the axis of circular coil carrying current (expression only).	03	
8.2 Tangent Galvanometer Principle and Working – Definition of Reduction Factor	01	
8.3 Force on a moving charge in a magnetic field – Force on a current carrying conductor placed in a magnetic field. Force between two long straight parallel conductors carrying current – Definition of Ampere. Flemmings Left Hand Rule	02	
8.4 Current loop as a magnetic dipole, Force and Torque on Current loop in an uniform magnetic field, magnetic dipole moment of a revolving electron.	02	
8.5 Principle, Construction and working of Moving Coil Galvanometer – Converting moving coil galvanometer into ammeter and voltmeter – comparison of M.C.G. with T.G.	03	
8.6 Electro magnetic induction – magnetic Flux – Induced E.M.F. – Faraday's and Lenz's Law.	02	
8.7 Flemings Right Hand Rule – Self Inductance – Mutual Inductance - Principle of Transformer.	03	
8.8 GROWTH & DECAY OF CURRENT IN L-R CIRCUIT: Growth and decay of charge in R.C. Circuit connected to D.C. source – Equations for charge on condenser – Current in inductor. Time constant – Definition and its significance.	02	
8.9 ALTERNATING CURRENTS (A.C): Introduction – Instantaneous, maximum and RMS value of A.C. current.	01	
8.10 Alternating Voltage applied to a pure resistor, pure inductor – pure capacitor	02	
8.11 C- R, L–R and L–C–R series circuits	02	
TOTAL	**23**	

CHAPTER - 9 ✳ **ATOMIC PHYSICS:**	
9.1 Discovery of electron – e/m of electron by Thomson's method – Charge of electron by Millikan's Oil Drop Method (Principle only).	03
9.2 Photo Electric Effect: Definition – laws of Photoelectric Emission – Einstein's explanation of photoelectric effect. Einstein's photoelectric equation and its experimental verification by Milikan's method. Photo Electric Cells - working and uses.	03
9.3 X-Rays: Production of X Rays – Coolridge tube - XRays Spectrum – Continuous X Ray Spectra – Characteristic X Ray Spectra Moseley's Law – Its importance	03
9.4 Compton effect (Statement only) – Dual nature of matter deBroglie's hypothesis (concept only)	02
TOTAL	**11**
CHAPTER – 10 ✳ **NUCLEAR PHYSICS:**	
10.1 Composition and *size* of nucleus, mass defect and binding energy and their relation. (Explanation with examples) Natural radio activity – alpha, beta and gamma radiation and their properties, radio active decay law, half life and average life of a radio active substance, Nuclear forces – Their Properties – Artificial transmutation of elements – Discovery of Neutron – Radio Isotopes and their uses.	05
10.2 Nuclear Fission – Chain Reaction – Principle and Working of a Nuclear Reactor – Nuclear Radiation hazards – Protective Shielding, Types of reactors – Breeder Reactor, Power Reactor and their uses.	03
10.3 Nuclear Fusion – Energy of sun and stars – Carbon – Nitrogen cycle and proton – proton cycle – Elementary particles	03
TOTAL	**11**

CHAPTER – 11 ✳		
SEMI CONDUCTOR DEVICES:		
11.1 Introduction, Intrinsic and Extrinsic semi conductors (n and p type).	02	
11.2 Junction diode – p – n junction, depletion layer and barrier potential, Forward and Reverse bias – Current voltage characteristics of junction diode – p–n Diode as half wave and full wave rectifier (only qualitative treatment), Zener Diode as a voltage regulator	04	
11.3 Transistor Function of Emitter, Base and Collector, p-n-p and n-p-n Transistors – Biasing of Transistors, Current - Voltage Characteristics of Transistor in CE configuration – Transistor as common emitter amplifier (qualitative treatment).	03	
12.1 Logic Gates (OR, AND, NOT, NOR, NAND)	02	
TOTAL	**11**	
CHAPTER – 12 ✳		
COMMUNICATION SYSTEMS:		
12.1 Elements of communication systems (block diagrams only) Bandwidth of signals (speech TV and digital data) bandwidth of Transmission medium – Propagation of electro magnetic waves in the atmosphere sky and space wave propagation. Modulation – Need for modulation	03	
TOTAL	**03**	
TOTAL PERIODS	**148**	