Curriculum
Subject – Physics (042)
Class XII
Session: 2026-27

EVALUATION SCHEME		
Theory		
		Marks
Unit - I	**Electrostatics**	**16**
	Chapter - 1 : Electric Charges and Fields	
	Chapter - 2 : Electrostatic Potential and Capacitance	
Unit - II	**Current Electricity**	
	Chapter - 3 : Current Electricity	
Unit - III	**Magnetic Effects of Current and Magnetism**	**17**
	Chapter - 4 : Moving Charges and Magnetism	
	Chapter - 5 : Magnetism and Matter	
Unit - IV	**Electromagnetic Induction and Alternating Currents**	
	Chapter - 6 : Electromagnetic Induction	
	Chapter - 7 : Alternating Currents	
Unit - V	**Electromagnetic Wave**	**18**
	Chapter - 8 : Electromagnetic Wave	
Unit - VI	**Optics**	
	Chapter - 9 : Ray Optics and Optical Instruments	
	Chapter - 10 : Wave Optics	
Unit - VII	**Dual Nature of Radiation and Matter**	**12**
	Chapter - 11 : Dual Nature of Radiation and Matter	
Unit - VIII	**Atoms and Nuclei**	
	Chapter - 12 : Atoms	
	Chapter - 13 : Nuclei	
Unit - IX	**Electronic Devices**	**7**
	Chapter - 14 : Semiconductor - Electronics: Materials, Devices and Simple Circuits	
	Total	**70**

Evaluation Scheme

Unit / Month	Chapters/ Learning Outcomes	Practical and Competency Skill Based Activities/ Experiential Learning	Skills	Assessments
Unit I (April)	**Chapter 1- Electrostatics** Students will be able to: ● Explain: Electric charges, conservation of charge ● Define Coulomb's law-force between two point charges and force between multiple charges. Superposition principle and continuous charge distribution. ● Explain: Electric field, electric field due to a point charge, electric field lines; electric dipole, electric field due to a dipole, torque on a dipole in a uniform electric field. ● Define: electric flux, statement of Gauss' theorem and its applications to find field due to infinitely long straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell (field inside and outside)	1. To determine the resistivity of two/three wires by plotting a graph between voltage and current.	Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Practical and technical skills: Experimentation, use of tools Communication skills: Scientific communication, interpretation Emotional and social development: Curiosity and exploration Academic and career readiness: Scientific literacy	Oral Test/ Class test/ Quizzes / lab activity
	Chapter 2- Electrostatic Potential and Capacitance: Students will be able to: ● Define: Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges ● Explain: Equipotential surfaces, electrical potential energy of a system of two point charges and electric dipoles in a electrostatic Field. ● Explain: Conductors and insulators, free charges and bound charges inside a conductor. Dielectric and electric polarization, ● Discuss: capacitor and capacitance. Combination of capacitor in series and parallel. Capacitance of parallel plate capacitor with and without dielectric medium between the plates. Energy stored in the capacitor (No derivation, formulae only).		Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Communication skills: Scientific communication, listening and interpretation Emotional and social development: Curiosity and exploration Academic and career readiness: Scientific literacy, interdisciplinary learning	Oral Test/ Class test/ Quizzes / lab activity

Unit 2 (May)	**Chapter 3- Current electricity** Students will be able to: ● Define: Electric current, flow of electric charges in a metallic conductor, drift velocity and mobility and their relation with electric current ● Explain: Ohm's law, V-I characteristics (linear and non linear) Electric energy and power. Electric resistivity and conductivity, Temperature dependence of resistance. ● Describe: Internal resistance of a cell, potential difference and e.m.f of a cell, combination of cells in series and in parallel. ● Discuss: Kirchhoff laws , Wheatstone bridge	2. To find the resistance of a given wire / standard resistor using a meter bridge. 3. To verify the laws of combination (Series) of resistance using meter bridge or To verify the laws of combination (Parallel) of resistance using meter bridge	Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Practical and technical skills: Experimentation, use of tools and technology, recording data Communication skills: Scientific communication Emotional and social development: Curiosity and exploration Academic and career readiness: Scientific literacy, interdisciplinary learning	Oral Test/ Class test/ Quizzes / Lab Activity
Unit3 (May - June)	**Chapter 4-Moving charge and Magnetism** Students will be able to: ● Explain: Magnetic field. Oersted's experiment. ● Describe: Biot-Savart's law and its application to current carry a circular loop. Ampere's law and its applications to infinitely long straight wire, Straight solenoid (only qualitative treatment) ● Define: force on a moving charge in uniform magnetic and electric fields. ● Describe: force On a current-carrying conductor in a uniform magnetic field. Force between two parallel plates current carrying conductor, definition of ampere. Torque experienced by a current loop in a uniform magnetic field. Current loop as a magnetic dipole and its magnetic dipole moment, moving coil galvanometer its current sensitivity and conversion to ammeter and voltmeter.	4. To determine resistance of a galvanometer by half deflection method and to find its figure of merits. 5. To convert the given galvanometer (of known resistance and figure of merit) into a voltmeter of desired range and to verify the same. **or** To convert the given galvanometer (of known resistance and figure of merit) into an ammeter of desired range and to verify the same.	Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Practical and technical skills: Experimentation, use of tools Communication skills: Scientific communication Emotional and social development: Curiosity and exploration Academic and career readiness: Scientific literacy	Oral Test/ Class test/ Quizzes / lab activity

	Chapter 5-Magnetism and matter Students will be able to: ● Explain: Bar magnet as an equivalent solenoid(qualitative treatment only) , magnetic field intensity due to magnetic dipole (bar magnet) along its axis and perpendicular to its axis(qualitative treatment only) ● Discuss: Torque on a magnetic dipole (bar magnet) in a uniform magnetic field (qualitative treatment only), magnetic field lines. Magnetic properties of material – Para, dia and Ferro magnetic substances with examples, magnetization of material, effect of temperature on magnetic properties.		Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Communication skills: Scientific communication Emotional and social development: Curiosity and exploration Academic and career readiness: Scientific literacy, interdisciplinary learning	
Unit 4 (June-july)	**Chapter 6-Electromagnetic induction and alternating Current** Students will be able to: Define: Electromagnetic induction; Faraday's law, induced e.m.f and current; Lenz's law, Self and mutual Induction. **Chapter 7- Alternating Current** Students will be able to: ● Discuss: Alternating current, peak and RMS value of alternating current/ voltage, reactance and impedance. LCR series circuit(Phasors only) , resonance ● Explain: power in ac Circuit, power factor, and wattles current. AC generator and transformer.		Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Communication skills: Scientific communication Emotional and social development: Curiosity and exploration Academic and career readiness: Scientific literacy	Oral Test/ Class test/ Quizzes / lab activity

Unit 5 (July)	**Chapter 8- Electromagnetic waves** Students will be able to: ● Discuss: Basic idea of displacement current, Electromagnetic waves and their characteristics their transverse nature (qualitative ideas Only).Electromagnetic spectrum (Radio waves, Microwaves, Infrared, visible, ultraviolet,X-rays, Gamma rays) including elementary facts about their uses.	6. To find the frequency of AC mains using sonometer.	Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Practical and technical skills: Experimentation, use of tools and technology Communication skills: Scientific communication Emotional and social development: Curiosity and exploration Academic and career readiness: Scientific literacy	Oral Test/ Class test/ Quizzes / lab activity
Unit 6 (July-August)	**Chapter 9-Ray optics and optical instruments** Students will be able to: ● Discuss**:** Reflection of light, Spherical mirrors ,mirror formula. Refraction of light. ● Define: Total internal reflection and optical fibers, refraction at spherical surfaces, lenses, thin lens formula, lens-maker's formula. ● Explain Magnification, power of a lens and combination of thin lenses in contact. ● Describe: Refraction of light through a prism. ● Optical instrument: microscope and astronomical telescope (reflecting and refracting) and their magnifying powers.	7.To find the value of v for different values of u in case of concave mirror and to find the focal length 8. To find the focal length of convex mirror, using a convex lens. 9. To find the focal length of a convex lens by plotting graphs between u and v or between 1/u and 1/v. 10. To find the focal length of a concave lens, using a convex lens. 11. To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle	Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Practical and technical skills: Experimentation, use of tools Communication skills: Scientific communication Emotional and social development: Curiosity and exploration Academic and career readiness: Scientific literacy, interdisciplinary learning	Oral Test/ Class test/ Quizzes / lab activity Oral Test/ Class test/ Quizzes / lab activity Oral Test/ Class test/ Quizzes / lab activity

	Chapter 10-Wave Optics Students will be able to : ● Explain: Wave optics: Wave front and Huygens' Principle, reflection and refraction of plane waves at a plane surface using wave fronts. ● Discuss: Proof of laws of reflection and refraction using Huygens principle. Interference, young's double slit experiment and expression for fringe width (no derivation final expression only), coherent source and sustained interference of light. Diffraction due to single slit, width of central maximum (qualitative treatment only).		Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Communication skills: Scientific communication, listening and interpretation Emotional and social development: Curiosity and exploration Academic and career readiness: Scientific literacy	Oral Test/ Class test/ Quizzes / lab activity
Unit 7 (Sept)	**Chapter 11-Dual nature of radiation and matter** Students will be able to: ● Explain: The Dual nature of radiation. Photoelectric effect, Hertz and Lenard's observation. ● Discuss: State Einstein's photoelectric equation- particle nature of light. experimental study of photoelectric effect ● Describe: Matter waves-wave nature of particles, de Broglie relation.		Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Communication skills: Scientific communication Emotional and social development: Curiosity and exploration Academic and career readiness: Scientific literacy	Oral Test/ Class test/ Quizzes / lab activity

Unit 8 (Sep-Oct)	**Chapter 12-Atoms** Students will be able to: ● Discuss: Alpha particles scattering experiment , Rutherford model of atom , Bohr model of hydrogen atom , expression for radius of nth possible orbit ,velocity and energy of electron in nth orbital, hydrogen line spectrum (qualitative treatment only) **Chapter 13- Nuclei** Students will be able to: ● Explain: Composition and size of nucleus, Nuclear force, mass energy relation, mass defect, binding energy per nucleon and its variation with mass number, nuclear fission and nuclear fusion.		Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Communication skills: Scientific communication, interpretation Emotional and social development: Curiosity and exploration Academic and career readiness: Scientific literacy	Oral Test/ Class test/ Quizzes / lab activity Oral Test/ Class test/ Quizzes / lab activity
Unit 9 (Nov)	**Chapter 14-Electronic devices** Students will be able to: ● Describe: Energy bands in conductors, semiconductor or an insulator (qualitative idea only), intrinsic and extrinsic semiconductors, p and n type, p-n junction semiconductor diode I-V characteristics in forward and reverse bias ● Explain: application of junction diode and diode as a rectifier.	12. To draw the I-V characteristics curve for a p-n junction diode in forward bias and reverse bias.	Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Practical and technical skills: Experimentation Communication skills: Scientific communication Emotional and social development: Curiosity and exploration Academic and career readiness: Scientific literacy	

Practical Evaluation Scheme

Two experiments one from each section	**7 +7 marks**
Practical record [experiments and activities]	**5 marks**
One activity from any section	**3 marks**
Investigatory Project	**3 marks**
Viva on experiments, and activities	**5 marks**
Total	**30 marks**