

Curriculum
Subject: Physics (042)
Session: 2022-23
Class: XII

| EVALUATION SCHEME | | |
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| 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 | |
| | Chapter - 8 : Electromagnetic Wave | |
| Unit - VI | Optics | 18 |
| | Chapter - 9 : Ray Optics and Optical Instruments | |
| | Chapter - 10 : Wave Optics | |
| Unit - VII | Dual Nature of Radiation and Matter | |
| | Chapter - 11 : Dual Nature of Radiation and Matter | |
| Unit - VIII | Atoms and Nuclei | 12 |
| | Chapter - 12 : Atoms | |
| | Chapter - 13 : Nuclei | |
| Unit - IX | Electronic Devices | 7 |
| | Chapter - 14 : Semiconductor - Electronics: Materials, Devices and Simple Circuits | |
| | Total | 70 |

| Unit / Month | Chapter Number and Name | Practical and Competency Skill Based Activities/ Experiential Learning | Skills | Assessments |
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| Unit 1 (Feb-March) | Chapter 1-Electrostatics Students will be able to: <ul style="list-style-type: none"> ● Explain: Electric charges, conservation of charge ● Define Coulomb's law-force between two point charges and force between multiple charges ● Explain: Electric field,electric field due to a point charge, electric field lines; electric 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. | 1. To determine the resistance per cm of a given wire by plotting a graph between voltage and current. | Knowledge, Understanding, Application, Analysis and Evaluation | Oral Test/ Class test/ Quizzes / lab activity |
| | Chapter 2-Electrostatic Potential and Capacitance Students will be able to: <ul style="list-style-type: none"> ● 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 | | Knowledge, Understanding, Application, Analysis and Evaluation. | Oral Test/ Class test/ Quizzes / lab activity |
| Unit 2 (April) | Chapter 3-Current electricity Students will be able to: <ul style="list-style-type: none"> ● 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. Electric energy and power. Electric resistivity and conductivity . Carbon resistor . Color code for carbon resistor. Series and parallel combination of resistor. 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. ● Understand: Kirchhoff laws and simple applications. Wheatstone bridge, meter bridge. Potentiometer-principle and applications to measure potential difference , and for comparing e.m.f of two cells. | 2. To find the resistance of a given wire / standard resistor using a meter bridge. Or To verify the laws of combination (Series/Parallel) of resistance using meter bridge 3. To compare the e.m.f of two given primary cells using a potentiometer. Or To determine the internal resistance of given primary cell using potentiometer | Knowledge, Understanding, Application, Analysis and Evaluation | Oral Test/ Class test/ Quizzes / lab activity |
| Unit 3/ (April- May) | Chapter 4-Moving charge and Magnetism Students will be able to: <ul style="list-style-type: none"> ● Explain: Magnetic field. Oersted's experiment. Magnetic field. Lorentz force. Magnetic force on a current carrying conductor placed in a uniform magnetic field.charged particle moving a uniform electric and magnetic field. ● Understand: Biot-Savart's law and its application to current carry a circular loop. Ampere's straight wire, straight and toroidal solenoids. ● 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 | 4 . To find the deflection of the galvanometer by half deflection method. 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 | Knowledge, Understanding, Application, Analysis and Evaluation | Oral Test/ Class test/ Quizzes / lab Activity |

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| | <p>parallel plates current carrying conductor. Torque experienced by a current loop in a uniform magnetic field. Moving coil galvanometer its current sensitive and conversion to ammeter and voltmeter.</p> <p>Chapter 5-Magnetism and matter Students will be able to: Define : Current loop as a magnetic dipole and it magnetic dipole moment, magnetic dipole moment of a revolving electron</p> <ul style="list-style-type: none"> ● Explain: Bar magnet as an equivalent solenoid, magnetic field lines ● Understand: Earth magnetic field and magnetic elements. <p>Chapter 6-Electromagnetic induction and alternating Current Students will be able to:</p> <ul style="list-style-type: none"> ● Define: Electromagnetic induction; Faraday's law, induced e.m.f and current; Lenz's law, Eddy currents. Self and mutual inductance | desired range and to verify the same. | Knowledge, Understanding, Application, Analysis and Evaluation | Oral Test/ Class test/ Quizzes / lab activity |
| Unit 4 (May- June) | <p>Chapter 7-Alternating Current Students will be able to:</p> <ul style="list-style-type: none"> ● Understand: Alternating current, peak and RMS value of alternating current/ voltage , reactance and impedance LC oscillation. LCR circuit, resonance ● Explain: power in ac Circuit, power factor, wattless current. Ac generator and transformer. | 6.To find the frequency of AC mains using sonometer | Knowledge, Understanding, Application, Analysis and Evaluation | Oral Test/ Class test/ Quizzes / lab activity |
| Unit 5 July | <p>Chapter 8-Electromagnetic waves students will be able to:</p> <ul style="list-style-type: none"> ● Define :Electromagnetic waves and their characteristics (qualitative ideas only).Electromagnetic spectrum(Radio waves,Microwaves,Infrared, visible, ultraviolet,X-rays, Gamma rays) including elementary facts about their uses. | | Knowledge, Understanding, Application, Analysis and Evaluation | Oral Test/ Class test/ Quizzes / lab activity |
| Unit 6 (July- August) | <p>Chapter 9- Ray optics and optical instruments students will be able to:</p> <ul style="list-style-type: none"> ● understand:Refraction of light ● Define: Total internal reflection and applications, optical fibers, refraction at spherical surfaces, lenses, thin lens formula, lens-maker's formula. Scattering of light- blue color of sky and reddish appearance of the sun at sunrise and sunset. Optical instrument: microscope and astronomical telescope. ● Explain: Magnification, power of a lens and combination of thin lenses in contact, combination of lens and mirror. ● Describe: refraction and dispersion of light through a prism. | <p>7. To find the focal length of convex lens by plotting graph between u and v. Or between $1/u$ and $1/v$</p> <p>8. To find the focal length of convex mirror , using a convex lens</p> <p style="text-align: center;">or</p> <p>To find the focal length of a concave lens ,using a convex lens.</p> <p>9. To determine the angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation.</p> <p>10. To determine the refractive index of a glass slab using a traveling microscope.</p> | Knowledge, Understanding, Application, Analysis and Evaluation | Oral Test/ Class test/ Quizzes / lab activity |

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| | Chapter 10-Wave Optics Students will be able to: <ul style="list-style-type: none"> ● Explain :Wave optics,Wavefront and Huygens' principle, reflection and refraction of plane waves at a plane surface using wave fronts. Give Proof of laws of reflection and refraction using Huygens principle. Interference, young's double slit experiment and expression for fringe width.diffraction due to single slit, width of central maximum. | 11. To find the refractive index of liquid by using a convex lens and a plane mirror. | Knowledge, Understanding, Application, Analysis and Evaluation | Oral Test/ Class test/ Quizzes / lab activity |
| Unit 7 (September) | Chapter 11-Dual matter of radiation students will be able to: <ul style="list-style-type: none"> ● Explain : The Dual nature of radiation. Photoelectric effect, Hertz observation.State Einstein's photoelectric equation- particle nature of light. ● Describe: Matter waves-wave nature of particles, de Broglie relation. | | Knowledge, Understanding, Application, Analysis and Evaluation | Oral Test/ Class test/ Quizzes / lab activity |
| Unit 8 (October) | Chapter 12-Atoms Students will be able to: <ul style="list-style-type: none"> ● Define: Alpha particles scattering experiment , Rutherford model of atom ,bohr model , energy levels, hydrogen spectrum Chapter - 13- Nuclei Students will be able to: <ul style="list-style-type: none"> ● Explain: Composition and size of nucleus, Radioactivity, alpha beta and gamma particle and their properties, radioactive decay law, mass energy relation, mass defect, binding energy per nucleon and its variation with mass number, nuclear fission and nuclear fusion | | Knowledge, Understanding, Application, Analysis and Evaluation | Oral Test/ Class test/ Quizzes / lab activity |
| Unit 9 (november) | Chapter 14-Electronic devices Students will be able to: <ul style="list-style-type: none"> ● Describe: energy bands in solids (qualitative) conductors, insulators and semiconductors; semiconductor diode I-V characteristics in forward and reverse bias, diode as a rectifier. ● Define :junction transistor, transistor action, characteristics of a transistor. | 12. To draw the I-V characteristics curve for a p-n junction diode in forward bias and reverse bias. | Knowledge, Understanding, Application, Analysis and Evaluation | Oral Test/ Class test/ Quizzes / lab activity |

Evaluation Scheme

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| 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 |