Cambridge INTERNATIONAL SCHOOL KULLU

Curriculum
Subject: Physics (042)
Class XI
Session: 2024-25

EVALUATION SCHEME		
Theory		
Units	**Title**	**Marks**
I	**Physical World and Measurement**	**23**
	Chapter–2: Units and Measurements	
II	**Kinematics**	
	Chapter–3: Motion in a Straight Line	
	Chapter–4: Motion in a Plane	
III	**Laws of Motion**	
	Chapter–5: Laws of Motion	
IV	**Work, Energy and Power**	
	Chapter–6: Work, Energy and Power	**17**
V	**Motion of System of Particles and Rigid Body**	
	Chapter–7: System of Particles and Rotational Motion	
VI	**Gravitation**	
	Chapter–8: Gravitation	
VII	**Properties of Bulk Matter**	
	Chapter–9: Mechanical Properties of Solids	**20**
	Chapter–10: Mechanical Properties of Fluids	
	Chapter–11: Thermal Properties of Matter	
VIII	**Thermodynamics**	
	Chapter–12: Thermodynamics	
IX	**Behavior of Perfect Gases and Kinetic Theory of Gases**	
	Chapter–13: Kinetic Theory	
X	**Oscillations and Waves**	
	Chapter–14: Oscillations	**10**
	Chapter–15: Waves	
Total		**70**

Unit / Month	Name of the Chapter	Practical and Competency Skill Based Activities/ Experiential Learning	Skills	Assessments
Unit I (April)	**Chapter 2-Units and Measurements** Students will be able to: ● Understand: Need for measurement: Units of measurement. ● Analyze: Systems of units; SI units, fundamental and derived units. Significant figures. ● Explain: Dimensions of physical quantities, dimensional analysis and its applications.	● To measure diameter of a small spherical/cylindrical body and to measure internal diameter and depth of a given beaker/calorimeter using Vernier Calipers and hence find its volume. ●To measure diameter of a given wire and thickness of a given sheet using screw gauge. ●To determine volume of an irregular lamina using screw gauge ●To determine radius of curvature of a given spherical surface by a Spherometer ● To determine the mass of two different objects using a beam balance.	Knowledge, Understanding, Application, Analysis and Evaluation	Oral Test/ Class test/ Quizzes / Lab activity
Unit II (May)	**Chapter 3-Motion in a Straight Line** Students will be able to: ● Explain: Frame of reference, Motion in a straight line, Elementary concepts of differentiation and integration for describing motion. ● Differentiate: Uniform and non- uniform motion, and instantaneous velocity, uniformly accelerated motion, velocity - time and position-time graphs. ● Understand: Relations for uniformly accelerated motion (graphical treatment). **Chapter–4: Motion in a Plane** Students will be able to: ● Explain: Scalar and vector quantities; position and displacement vectors, general vectors and their notations. ● Understand: Equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors, Unit vector. ● Analyze: Resolution of a vector in a plane, rectangular components, Scalar and Vector product of vectors. ● Define: Motion in a plane, cases of uniform velocity and uniform acceleration projectile motion, uniform circular motion.	●To find the weight of a given body using parallelogram law of vectors ●Using a simple pendulum, plot its L-T2 graph and use it to find the effective length of second's pendulum. ●To study variation of time period of a simple pendulum of a given length by taking bobs of same size but different masses and interpret the result. ● Measurement of distance and displacement in the ground.	Knowledge, Understanding, Application, Analysis and Evaluation	Oral Test/ Class test/ Quizzes / Lab activity
Unit III (May-June)	**Chapter 5- Laws of Motion** Students will be able to: ● Explain: Intuitive concept of force, Inertia, Newton's first law of motion; momentum. ● Understand: Newton's second law of motion; impulse; Newton's third law of motion. ● Analyze: Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces, sratic and kinetic friction. Laws of friction, rolling friction, lubrication. ● Define: Dynamics of uniform circular motion: Centripetal force, Examples of circular motion(vehicle on a level circular road, vehicle on a banked road).	● To study variation of time period of a simple pendulum of a given length by taking bobs of same size but different masses and interpret the result. ● To find the downward force, along an inclined plane, acting on a roller due to the gravitational pull of the earth and study its relationship with the angle of inclination θ by plotting a graph between force and Sinθ.	Knowledge, Understanding, Application, Analysis and Evaluation	Oral Test/ Class test/ Quizzes / Lab Activity
Unit IV (June-July)	**Chapter 6-Work, Energy and Power** Students will be able to: ● Explain: Work done by a constant force and a variable force; kinetic energy. ● Understand: Work energy theorem, power. Notion of potential energy, potential energy of a spring, conservative forces: non- conservative forces, motion in a vertical circle. ● Differentiate: Elastic and inelastic collisions in one and two dimensions.	**Visit to Fermenta**	Knowledge, Understanding, Application, Analysis and Evaluation	Oral Test/ Class test/ Quizzes / Lab activity

Unit V (July-August)	**Chapter 7-System of Particles and Rotational Motion** students will be able to: ● Explain: Centre of mass of a two-particle system, momentum conservation and Centre of mass motion. ● Understand: Centre of mass of a rigid body; centre of mass of a uniform rod. Moment of a force, torque, angular momentum. ● Define: Law of conservation of angular momentum and its applications. Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions. ● Differentiate: Moment of inertia, radius of gyration, values of moments of inertia for simple geometrical objects (no derivation).	● Application of rotational motion on circular objects	Knowledge, Understanding, Application, Analysis and Evaluation	Oral Test/ Class test/ Quizzes / Lab activity
Unit VI (August)	**Chapter 8- Gravitation** students will be able to: ● Explain: Kepler's laws of planetary motion, universal law of gravitation. ● Understand: Acceleration due to gravity and its variation with altitude and depth. ● Differentiate: Gravitational potential energy and gravitational potential, escape speed, orbital velocity of a satellite.	● Activity based upon gravitation in the ground	Knowledge, Understanding, Application, Analysis and Evaluation	Oral Test/ Class test/ Quizzes / Lab activity
Unit VII (Sep)	**Chapter 9 -Mechanical Properties of Solids** Students will be able to**:** ● Explain: Elasticity, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus. ● Understand: shear modulus of rigidity (qualitative idea only), Poisson's ratio; elastic energy. **Chapter 10:Mechanical Properties of Fluids** Students will be able to: ● Explain: Pressure due to a fluid column; Pascal's law and its applications (hydraulic lift and hydraulic brakes), effect of gravity on fluid pressure. Viscosity, Stokes' law, terminal velocity. ● Differentiate: Streamline and turbulent flow, critical velocity, Bernoulli's theorem and its simple applications. ● Understand: Surface energy and surface tension, angle of contact, excess of pressure across a curved surface, application of surface tension ideas to drops, bubbles and capillary rise. **Chapter 11:Thermal Properties of Matter** Students will be able to: ● Explain: Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gasses, anomalous expansion of water; specific heat capacity; Cp, Cv - calorimetry. ● Understand: Change of state - latent heat capacity. Heat transfer-conduction, convection and radiation. ● Analyze: thermal conductivity, qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law.	● To determine Young's modulus of elasticity of the material of a given wire. ● To find the force constant of a helical spring by plotting a graph between load and extension. ● To study the variation in volume with pressure for a sample of air at constant temperature by plotting graphs between P and V, and between P and 1/V. ● To determine the coefficient of viscosity of a given viscous liquid by measuring terminal velocity of a given spherical body. **Field trip to Hydroelectric Project**	Knowledge, Understanding, Application, Analysis and Evaluation Knowledge, Understanding, Application, Analysis and Evaluation Knowledge, Understanding, Application, Analysis and Evaluation	Oral Test/ Class test/ Quizzes / Lab activity Oral Test/ Class test/ Quizzes / Lab activity Oral Test/ Class test/ Quizzes / Lab activity
Unit VIII (Sep-Oct)	**Chapter 12-Thermodynamics** Students will be able to: ● Define: Thermal equilibrium and definition of temperature zeroth law of thermodynamics. ● Explain: heat, work and internal energy. First law of thermodynamics. ● Understand: Second law of thermodynamics: gaseous state of matter, change of condition of gaseous state - isothermal, adiabatic, reversible, irreversible, and cyclic processes.	● To study the relationship between the temperature of a hot body and time by plotting a cooling curve. ● To determine specific heat capacity of a given solid by method of mixtures.	Knowledge, Understanding, Application, Analysis and Evaluation	Oral Test/ Class test/ Quizzes / Lab activity

Unit IX (Oct-Nov)	**Chapter 13-Kinetic Theory** Students will be able to: ● Describe: Equation of state of a perfect gas, work done in compressing a gas. Kinetic theory of gases - assumptions. ● Explain: concept of pressure. Kinetic interpretation of temperature; rms speed of gas molecules; ● Understand: Degrees of freedom, law of equi-partition of energy (statement only) and application to specific heat capacities of gases. ● Define: Concept of mean free path, Avogadro's number.	● Application of Charles law and Boyle's law by different examples.	Knowledge, Understanding, Application, Analysis and Evaluation	Oral Test/ Class test/ Quizzes / Lab activity
Unit X (November-December)	**Chapter 14: Oscillations** Students will be able to: ● Understand: Periodic motion - time period, frequency, displacement as a function of time, periodic functions and their application. ● Explain: Simple harmonic motion (S.H.M) and its equations of motion; phase. ● Analyze: Oscillations of a loaded spring- restoring force and force constant; energy in S.H.M. Kinetic and potential energies. ● Define: Simple pendulum derivation of expression for its time period. **Chapter–15: Waves** Students will be able to: ● Explain: Wave motion: Transverse and longitudinal waves. ● Understand: Speed of traveling wave, displacement relation for a progressive wave, principle of superposition of waves, reflection of waves. ● Define: Standing waves in strings and organ pipes, fundamental mode and harmonics, Beats.	• 17.To study the relation between frequency and length of a given wire under constant tension using sonometer • .To study the relation between the length of a given wire and tension for constant frequency using sonometer • To find the speed of sound in air at room temperature using a resonance tube by two resonance positions.	Knowledge, Understanding, Application, Analysis and Evaluation Knowledge, Understanding, Application, Analysis and Evaluation	Oral Test/ Class test/ Quizzes / Lab activity Oral Test/ Class test/ Quizzes / Lab activity

PRACTICAL

Sr. No.	Evaluation Scheme	Marks
1	Two experiments one from each section	7 +7
2	Practical record [experiments and activities]	5
3	One activity from any section	3
4	Investigatory Project	3
5	Viva on experiments, and activities	5
	Total	**30**

Sr. No.	Books	Publisher
1	Physics Part - I	NCERT
2	Physics Part - II	NCERT
3	Lab Manual	Evergreen