Cambridge International School, Mohal, Kullu

Class-XI , Subject – Physics, 2020-21

Subject Code (042)

	TOPIC	LEARNING OBJECTIVES	Month	ASSESMENT/ASSIGNMENT
1)	Physical World and Measurements	To be able to understand the Scope and excitement; nature of physical laws; Physics, technology and society. *Need for measurement*: Units of measurement; systems of units; SI units, fundamental and derivedunits. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures. Dimensions of physical quantities, dimensional analysis and its applications.	**APRIL**	Knowledge based questions Conceptual questions HOTS **SKLLS** Analytical skills Reasoning skills Numerical solving skills
2)	Kinematics	To be able to understand the concept of Frame of reference, Motion in a straight line: Position-time graph, speed and velocity. Uniform and non-uniform motion, average speed and instantaneous velocity. Uniformly accelerated motion, velocity-time and position-time graphs, relations for uniformly accelerated motion (graphical treatment). Elementary concepts of differentiation and integration for describing motion. *Scalar and vectorquantities*: Position and displacement vectors, general vectors and notation, equality of vectors, multiplicationof vectors by a real number; addition and subtraction of vectors. Relative velocity. Unit vectors. Resolution of a vector in a plane – rectangular components. Scalar and Vector products of Vectors. Motion in a plane. Cases of uniform velocity and uniform acceleration – projectile motion. Uniform circular motion.	**MAY-JUNE**	Group discussion Conceptual questions Pen paper test Solving Numerical **Skills** Numerical solving skills Practical skills
3)	Laws of Motion	To be able to understand the cause of Intuitive concept of force. Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion. Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces. Static and kinetic friction, laws of friction, rolling friction, lubrication. *Dynamics of uniform circular motion*: Centripetal force, examples of circular motion (vehicle onlevel circular road, vehicle on banked road).		Knowledge based questions HOTS Numerical solving skills Conceptual understanding of the subject matter
4)	Work Energy and Power	To be able to understand the concept of Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power. Notion of potential energy, potential energy of a spring, conservative forces; conservation of mechanical energy (kinetic and potential energies); non-conservative forces; motion in a vertical circle, elastic and inelastic collisions in one and two dimensions.	**JUNE**	Assignment on numerical Numerical solving skills Analytical skills Practical skills

5) Motion of System of Particles and Rigid Body	To be able to understand the concept of Centre of mass of a two- particle system, momentum conservation and Centre of mass motion. Centre of mass of a rigid body; centre of mass of uniform rod. Moment of a force, torque, angular momentum, conservation of angular momentum with some examples.Equilibrium of rigid bodies, rigid body rotation and equation of rotational motion, comparison of linear and rotational motions; moment of inertia, radius of gyration. Values of M.I. for simple geometrical objects (no derivation). Statement of parallel and perpendicular axes theorems and their applications.	**JULY**	MCQ's test of various concepts f theory and numerical Conceptual understanding
6) Gravitation	To be able to understand the concept ofKepler's laws of planetary motion. The universal law of gravitation. Acceleration due to gravity and its variation with altitude and depth. Gravitational potential energy; gravitational potential. Escape velocity, orbital velocity of a satellite. Geostationary satellites.	**AUGUST**	Knowledge based questions MCQ's test of numericals **Skill** Reasoning and understanding
7) Properties of Bulk Matter	To be able to understand the concept of Elastic behaviour, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear, modulus of rigidity, poisson's ratio; elastic energy. 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, Reynold's number, streamline and turbulent flow. Critical velocity, Bernoulli's theorem and its applications. Surface energy and surface tension, angle of contact, excess of pressure, application of surface tension ideas to drops, bubbles and capillary rise. Heat, temperature, thermal expansion; thermal expansion of solids, liquids, and gases. Anomalous expansion. Specific heat capacity: C_p, C_v – calorimetry; change of state – latent heat. Heat transfer – conduction and thermal conductivity, convection and radiation. Qualitative ideas of Black Body Radiation, Wein's displacement law, and Green House effect. Newton's law of cooling and Stefan's law.	**SEPTEMBER**	Pen paper test of theory Assignment on numerical will be analyzed **Skill** **Understanding and knowledge**.

8) Thermodynamics	To be able to understand the concept of Thermal equilibrium and definition of temperature (zeroth law of Thermodynamics). Heat, work and internal energy. First law of thermodynamics. Isothermal and adiabatic processes. x *Second law of thermodynamics*: Reversible and irreversible processes. Heat engines and refrigerators.	**OCTOBER**	Knowledge based questions HOTS Numerical solving skills Conceptual understanding of the subject matter
9) Behaviour of perfect gas and kinetic theory	To be able to understand the concept of Equation of state of a perfect gas, work done on compressing a gas. *Kinetic theory of gases*: Assumptions, concept of pressure. Kinetic energy and temperature; *rms* speed of gas molecules; degrees of freedom, law of equipartition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.	**NOVEMBER**	Group discussion **Skills** Critical thinking skill
10) Oscillation and wave	To be able to understand the concept of Periodic motion – period, frequency, displacement as a function of time. Periodic functions. Simple harmonic motion (SHM) and its equation; phase; oscillations of a spring – restoring force and force constant; energy in SHM – kinetic and potential energies; simple pendulum – derivation of expression for its time period; free, forced and damped oscillations (qualitative ideas only), resonance. Wave motion. Longitudinal and transverse waves, speed of wave motion. Displacement relation for a progressive wave. Principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, fundamental mode and harmonics. Beats. Doppler effect.		Knowledge based questions MCQ's test of numericals **Skill** Reasoning and understanding

PRACTICALS
Section A

April-June

1. To measure diameter of a small spherical/cylindrical body using Vernier callipers.
2. To measure internal diameter and depth of a given beaker/calorimeter using Vernier callipers and hence find its volume.
3. To measure diameter of a given wire using screw gauge.
4. To measure thickness of a given sheet using screw gauge.
5. To determine volume of an irregular lamina using screw gauge

6. To determine radius of curvature of a given spherical surface by a spherometer.
7. Using a simple pendulum, plot L-T and L-T^2 graphs. Hence find the effective length of a second's pendulum using appropriate graph.

Section B

August-November

1. To determine the coefficient of viscosity of a given viscous liquid by measuring the terminal velocity of a given spherical body.
2. To study the relationship between the temperature of a hot body and time by plotting a cooling curve.
3. To find the force constant of a helical spring by plotting a graph between load and extension.

4. 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

Evaluation scheme for Practical Examination:

- Two experiments one from each section — 8+8 Marks
- Practical record — 6 Marks
- Project — 3 Marks
- Viva on experiments and project — 5 Marks