S.B.P.D.A.V CENTENARY PUBLIC SCHOOL, FATEHABAD
CLASS-XI
SUBJECT-PHYSICS
Session: 2023-24

Month	Chapter	Content	LAB Activities And Experiments	Assignment
April	**Units and Measurements**	Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. significant figures. Dimensions of physical quantities, dimensional analysis, and its applications.	**Experiment 1:** 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.	Practice of questions and numerical
	Motion in a Straight Line	Elementary concepts of differentiation Elementary concepts of integration for describing motion. Frame of reference, Motion in a straight line, uniform and non- uniform motion, and instantaneous velocity, uniformly accelerated motion, velocity - time and position-time graphs. Relations for uniformly accelerated motion (graphical treatment).	**Experiment 2:** To measure diameter of a given wire and thickness of a given sheet using screw gauge.	
	Motion in a Plane	Scalar and vector quantities; position and displacement vectors, general vectors, and their notations; equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors, Unit vector; resolution of a vector in a plane, rectangular components, Scalar and Vector product of vectors.		
May	**Motion in a Plane**	Motion in a plane, cases of uniform velocity and uniform acceleration- projectile motion, uniform circular motion.	**Activity1:** To make a paper scale of given least count, e.g., 0.2cm, 0.5 cm.	Practice of questions and numerical
	Laws of Motion	Intuitive concept of force, Inertia, Newton's first law of motion;		

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		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 on a level circular road, vehicle on a banked road).	**Activity2:** To plot a graph for a given set of data, with proper choice of scales and error bars.	
	Work, Energy and Power	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: non-conservative forces, motion in a vertical circle; elastic and inelastic collisions in one and two dimensions.		
June				Practice of questions and numerical
July	**System of Particles and Rotational Motion**	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 a uniform rod. Moment of a force, torque, angular momentum, 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. Moment of inertia, radius of gyration, values of moments of inertia for simple geometrical objects (no derivation).	**Experiment 3:** To determine volume of an irregular lamina using screw gauge. **Experiment 4:** To determine radius of curvature of a given spherical surface by a spherometer.	Practice of questions and numerical

	Gravitation	Kepler's laws of planetary motion, universal law of gravitation. Acceleration due to gravity and its variation with altitude and depth. Gravitational potential energy and gravitational potential, escape velocity, orbital velocity of a satellite.		
August	**Mechanical Properties of Solids**	Elasticity, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear modulus of rigidity (qualitative idea only), Poisson's ratio; elastic energy.	**Activity 3:** To study the variation in range of a projectile with angle of projection. **Activity 4:** To observe and explain the effect of heating on a bi-metallic strip.	Practice of questions and numerical.
September	**Revision and Half Yearly Exams**			
October	**Mechanical Properties of Fluids**	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, streamline and turbulent flow, critical velocity, Bernoulli's theorem and its simple applications. 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.	**Experiment 5.** To determine Young's modulus of elasticity of the material of a given wire. **Experiment 6:** To study the relationship between the temperature of a hot body and time by plotting a cooling curve. **Activity 5:** To study the factors affecting the rate of loss of heat of a liquid.	Practice of questions and numerical
	Thermal Properties of Matter	Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; C_p, C_v - calorimetry; change of state - latent heat capacity. Heat transfer-conduction, convection and radiation, thermal conductivity, qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law.		

	Thermodynamics	Thermal equilibrium and definition of temperature zeroth law of thermodynamics, heat, work and internal energy. First law of thermodynamics, Second law of thermodynamics: gaseous state of matter, change of condition of gaseous state -isothermal, adiabatic, reversible, irreversible, and cyclic processes.		
November	**Kinetic Theory**	Equation of state of a perfect gas, work done in compressing a gas. Kinetic theory of gases - assumptions, concept of pressure. Kinetic interpretation of temperature; rms speed of gas molecules; degrees of freedom, law of equi-partition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.	**Experiment 7:** 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 $1/V$.	Practice of questions and numerical
	Oscillations	Periodic motion - time period, frequency, displacement as a function of time, periodic functions and their application. Simple harmonic motion (S.H.M) and its equations of motion; phase; oscillations of a loaded spring- restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum derivation of expression for its time period.	**Experiment 8:** To find the force constant of a helical spring by plotting a graph between load and extension.

Activity 6: To note the change in level of liquid in a container on heating and interpret the observations. | |
| **December** | **Waves** | Wave motion: Transverse and longitudinal waves, speed of travelling wave, displacement relation for a progressive wave, principle of superposition of waves, reflection of waves, standing waves in strings and | | Practice of questions and numerical |

		organ pipes, fundamental mode and harmonics, Beats.		
January		**Revision and Pre-Board**		
February				
March				