SUBJECT: PHYSICS

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| **MONTH** | **CHAPTER** | **DETAIL CONCEPTS TO BE COVERED** | **PRACTICALS** |
| JUNE | Basic differentiation, Basic Integration  Motion in straight line | Formulae and examples problems  Introduction,distnce-displacement,spped - velocity,acceleration and its types, equations of motion, x-t,v-t , a-t graphs,derivation of equations of motion by graphical and calculus method,uniform circular motion  uniform circular motion |  |
| JULY | Motion in a plane  Measurement | 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. Relative velocity. Unit vector; Resolution of a vector in a plane - rectangular components. Scalar and Vector product of vectors.  Motion in a plane, cases of uniform velocity and uniform acceleration-projectile motion. Uniform circular motion.  Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures. | 1. Vernier calliperse 2. Screw gauge |
| AUGUST | Measurement  Laws of motion  Work power energy  Systems of particles  Gravitation | Dimensions of physical quantities, dimensional analysis and its applications  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 on a level circular road, vehicle on banked road |  |
| SEPTEMBER | 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. |  |
| 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, laws 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 object statement of parallel and perpendicular axes theorems and their applications. Keplar's laws of planetary motion. The 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. Geo-stationary satellites. | 1. Spherometer 2. Sipmle   pendulum |
| OCTOBER  NOVEMBER | Oscillations  Mechanical properties of solids  Mechanical properties of fluids | Periodic motion - time period, frequency, displacement as a function of time. Periodic functions.  Simple harmonic motion (S.H.M) and its equation; phase; oscillations of a spring-restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum derivation of expression for its time period  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, streamline and turbulent flow, critical velocity. Bernoulli’s theorem and its applications |  |
| Mechanical properties of fluids  Thermal properties of matter  Thermodynamics | . Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; Cp, Cv - 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, Green house effect.  Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; Cp, Cv - 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, Green house effect.  Reflection of light, spherical mirrors, mirror formula  Refraction of light, total internal reflection and its applications, optical fibres, | 1. Hooke’s law 2. Boyle’s law |