PHYSICS

BREAK -UP OF SYLLABUS

[2022 -2023]

CLASS: XI

S.No./Unit	Chapter/Date	Topic	Periods	Total no. of Periods
1	Units and Measurements **August 2022**	A. Need for measurement: Units of measurement; systems of units; B. SI units, fundamental and derived units. C. Dimensions of physical quantities, dimensional analysis and its applications D. Significant figures.	**01** **01** **03** **01**	**06**
2	Motion in a Straight Line **Till 15/Sep/22**	A. Elementary concepts of differentiation and integration for describing motion, B. Frame of reference, C. Motion in a straight line uniform and non- uniform motion, and instantaneous velocity, D. Uniformly accelerated motion, velocity - time and position-time graphs. E. Relations for uniformly accelerated motion (graphical treatment).	**02** **01** **02** **03** **02**	**10**
3	Motion in a Plane **Sep / Oct 2022**	A. Scalar and vector quantities; position and displacement vectors, B. General vectors and their notations; equality of vectors, C. Multiplication of vectors by a real number; addition and subtraction of vectors, Unit vector; D. Resolution of a vector in a plane, rectangular components, E. Scalar and Vector product of vectors. F. Motion in a plane, cases of uniform velocity and uniform acceleration G. Projectile motion, H. Uniform circular motion.	**01** **01** **02** **02** **02** **01** **03** **01**	**12**
Chapter 1,Chapter 2 and Chapter 3 (till Article C) will be included in the Written test I.				
4	Laws of Motion **Oct 2022**	A. Intuitive concept of force, B. Inertia, Newton's first law of motion; C. Momentum and Newton's second law of motion; impulse; Newton's third law of motion. D. Law of conservation of linear momentum and its applications. E. Equilibrium of concurrent forces, F. Static and kinetic friction, laws of friction, rolling friction, lubrication. G. Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on a level circular road, vehicle on a banked road).	**01** **01** **01** **01** **01** **02** **03**	**10**
5	Work, Energy and Power	A. Work done by a constant force and a variable force; B. Kinetic energy, work- energy theorem, power.	**01**	

	Oct/Nov 2022	C. Notion of potential energy, potential energy of a spring, D. Conservative forces: non- conservative forces, E. Motion in a vertical circle; F. Elastic and inelastic collisions in one and two dimensions.	**02** **01** **01** **01** **03**	**09**
6	System of Particles and Rotational Motion **Nov 2022**	A. Centre of mass of a two-particle system, B. Momentum conservation and Centre of mass motion. C. Centre of mass of a rigid body; Centre of mass of a uniform rod. D. Moment of a force, torque, angular momentum, law of conservation of angular momentum and its applications. E. Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions. F. Moment of inertia, radius of gyration, values of moments of inertia for simple geometrical objects (no derivation).	**01** **01** **01** **03** **02** **02**	**10**
7	Gravitation **Nov/ Dec 2022**	A. Kepler's laws of planetary motion, universal law of gravitation. B. Acceleration due to gravity and its variation with altitude and depth. C. Gravitational potential energy and gravitational potential, escape velocity, D. Orbital velocity of a satellite	**01** **02** **03** **02**	**08**
Chapter 1 to Chapter 7 included in Half Yearly Examination				
8	Mechanical Properties of Solids **Jan 2022**	**A.** Elasticity, Stress-strain relationship, Hooke's law, **B.** Young's modulus, bulk modulus, shear modulus of rigidity (qualitative idea only), **C.** Poisson's ratio; elastic energy.	**01** **02** **01**	**04**
	Mechanical Properties of Fluids **Jan 2022**	A. Pressure due to a fluid column; Pascal's law and its applications (hydraulic lift and hydraulic brakes), effect of gravity on fluid pressure. B. Viscosity, Stokes' law, terminal velocity, streamline and turbulent flow, critical velocity, C. Bernoulli's theorem and its simple applications. **D.** 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.	**03** **03** **03** **03**	**12**
	Thermal Properties of Matter **Jan 2022**	A. Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, B. Anomalous expansion of water; specific heat capacity; C. Cp, Cv - calorimetry; change of state - latent heat capacity. **D.** Heat transfer-conduction, convection and radiation, thermal conductivity,	**02** **01** **01** **02**	**07**

		E. Qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law .	**01**	
9	Thermodynamics **Feb 2022**	A. Thermal equilibrium and definition of temperature zeroth law of thermodynamics, heat, work and internal energy. First law of thermodynamics, B. Second law of thermodynamics: gaseous state of matter, C. change of condition of gaseous state -isothermal, adiabatic, reversible, irreversible, and cyclic processes.	**02** **02** **02**	**06**
10	Kinetic Theory **Feb 2022**	A. Equation of state of a perfect gas, work done in compressing a gas. **B.** Kinetic theory of gases - assumptions, concept of pressure. **C.** Kinetic interpretation of temperature; rms speed of gas molecules; degrees of freedom, law of equi-partition of energy (statement only) and **D.** Application to specific heat capacities of gases; concept of mean free path, Avogadro's number.	**02** **02** **01** **01**	**06**
11.	Oscillations **Jan 2022**	A. Periodic motion - time period, frequency, displacement as a function of time, periodic functions and their application. **B.** Simple harmonic motion (S.H.M) and its equations of motion; phase; **C.** Oscillations of a loaded spring- restoring force and force constant; energy in S.H.M. Kinetic and potential energies; **D.** Simple pendulum derivation of expression for its time period.	**02** **01** **02** **02**	**07**
	Waves **Jan 2022**	A. Wave motion: Transverse and longitudinal waves, B. Speed of travelling wave, displacement relation for a progressive wave, C. Principle of superposition of waves, reflection of waves, D. Standing waves in strings and organ pipes, E. Fundamental mode and harmonics, F. Beats.	**01** **02** **01** **02** **02** **01**	**09**
Chapter 1 to Chapter 11 to be included in the Annual Examination.				

- **EXTRA CLASSES WILL BE REQUIRED.**

PRACTICALS

Experiments

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.

2. To measure diameter of a given wire using screw gauge.

3. To find the weight of a given body using parallelogram law of vectors.

4. To study the relationship between force of limiting friction and normal reaction and to find the co-efficient of friction between a block and a horizontal surface.

5. To find the force constant of a helical spring by plotting a graph between load and extension.

6. To study the relation between the length of a given wire and tension for constant frequency using sonometer.