

D.A.V. Public School
Sector – 3 Dhurwa Ranchi – 4

Class XI

PHYSICS Syllabus (2019-2020)

Prescribed Books:

- **Physics For Class XI (NCERT)**
- **Laboratory Manual Physics Class – Class XI**

Months	Unit / Chapters	Sub Topics	Exam / Tests Portion
June	<u>Unit I: Physical World and Measurement</u>	Physics - scope and excitement; nature of physical laws; Physics, technology and society. 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 measurements, significant figures. Dimensions of physical quantities, dimensional analysis and its applications.	
		Monthly Test – Unit I (30 Marks)	
July	<u>Unit II: Kinematics</u>	Frame of reference. Motion in a straight line: Position-time graph, speed and velocity. Uniform and non-uniform motion, speed and velocity - average and instantaneous Uniformly accelerated motion, velocity-time graph and position-time graph, equations for uniformly accelerated motion (graphical treatment only). Simple introduction to elementary concepts of differentiation and integration for describing motion. Scalar and vector quantities: vectors, notation, equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors. Position and displacement 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.	
		Monthly Test – Unit II (30 Marks)	

August	<p><u>Unit III: Laws of Motion</u></p> <p><u>Unit IV: Work, Energy and Power</u></p>	<p>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. Uniform circular motion. Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on level circular road, vehicle on banked road).</p> <p>Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power.</p>	
		Monthly Test – Unit III & Unit IV Some Portion(30 Marks)	
September	<p><u>Unit IV: Work, Energy and Power</u></p>	<p>Notion 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 collisions and elementary idea of inelastic collisions (in one and twodimensions)</p> <p>Revision for PT I</p>	<p><u>Half Yearly Exam Portion</u></p> <p>PT I Portion</p>
		Monthly Test – Unit IV(30 Marks)	
October	<p><u>Term- II</u></p> <p><u>Unit V: Motion of System of Particles and Rigid Body</u></p>	<p>Centre of mass of a two-particle system, Centre of mass of rigid body. Centre of mass of uniform rod. Momentum conservation and centre of mass motion. Vector product of vectors; moment of a force, torque, angular momentum, conservation of angular momentum with some examples. Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion (cont.)</p>	
		Monthly Test – Some portion Unit V (30 Marks)	
November	<p><u>Unit V: Motion of System of Particles and Rigid Body</u></p> <p><u>Unit VI: Gravitation:</u></p>	<p>comparison of linear and rotational motions; Moment of inertia, radius of gyration, values of moments of inertia for simple geometrical objects (no derivation). Statement of parallel and perpendicular axes theorem and their applications.</p> <p>Keplar's Laws of planetary motion. The universal law of gravitation; Acceleration due to gravity and its variation</p>	

		with altitude and depth. Gravitational potential energy; gravitational potential; Escape velocity, orbital velocity of a satellite, Geostationary satellites.	
		Monthly Test – Unit VI (30 Marks)	
December	<p><u>Unit VII: Properties of Bulk Matter :</u></p> <p><u>Unit – VIII: Thermodynamics</u></p>	<p>Elastic behaviour, stress-strain relationship, Hooke’s law, Young’s modulus, bulk modulus, shear modulus of rigidity. Poisson’s ratio, elastic energy.</p> <p>Pressure due to fluid column, Pascal’s law and its applications (hydraulic lift and hydraulic brakes), Effects of gravity on fluid pressure, Viscosity, Stoke’s Law, Terminal Velocity, Reynold’s number, Streamline and turbulent flow, critical velocity, Bernoulli’s theorem and its applications.</p> <p>Surface energy and surface tension, angle of contact, excess of pressure, application of surface tension, ideas to drops, bubbles and Capillary rise.</p> <p>Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion, specific heat capacity; Cp & Cv, calorimetry; change of state, Latent heat capacity.</p> <p>Heat transfer : Conduction, convection and radiation; qualitative ideas of black body radiation, green house effect, thermal conductivity, Newton's law of cooling. Wein’s displacement law, Stefan’s law.</p> <p>Thermal equilibrium and definition of temperature (zeroth law of thermodynamics), Heat, work and internal energy; First law of thermodynamics, isothermal and adiabatic processes, Second Law of thermodynamics. Reversible and irreversible processes. Heat engines and refrigerators.</p> <p style="text-align: center;">Revision for PT II</p>	<u>PT II Portion</u>
		Monthly Test – Unit VII & VIII (30 Marks)	

January	<p><u>Unit- IX: Behaviour of Perfect Gas and Kinetic Theory:</u></p> <p><u>Unit- X : Oscillations and Waves:</u></p>	<p>Equation of state of a perfect gas, work done on compressing a gas.</p> <p>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 of specific heat capacities of gases, concept of mean free path. Avogadro’s number.</p> <p>Periodic motion - period & frequency, displacement as a function of time and periodic functions, Simple harmonic motion (SHM) and its equation Phase, Oscillation 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; Free and 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 string and organ pipes, fundamental mode and harmonics. Beats, Doppler effect .</p>	
		Monthly Test – Unit IX & X (30 Marks)	
February	X Ray Optics		<u>PT III Portion</u>
	Revision for PT III & Final / Annual Term		<u>Final / Annual Term Portion</u>

SYLLABAS HALF YEARLY EXAMINATION -2019

Class : XI Physics

Time: 3 Hrs.

Max. Marks : 70

I. Weightage to content/subject units:

Unit No.	Title	Marks
Unit I	Physical World & Measurement	15
Unit II	Kinematics	20
Unit III	Laws of Motion	20
Unit IV	Work, Energy & Power	15
	Total	70

Time: 3 Hrs

Max. Marks : 70

II. SYLLABAS ANNUAL EXAMINATION- 2020

Unit No.	Title	Marks
Unit I	Physical World & Measurement	15
Unit II	Kinematics	20
Unit III	Laws of Motion	20
Unit IV	Work, Energy & Power	15
	Total	70

III. Weightage to form of Questions:

S.No.	Form of Questions	Marks for each question	No. of questions	Total Marks
1.	Long Answer Type (LA)	5	03	15
2.	Value Based Question	4	01	04
3.	Short Answer (SA I)	3	12	36
4.	Short Answer (SA II)	2	05	10
5.	Very Short Answer (VSA)	1	05	05
	Total		26	70