DAV PUBLIC SCOOLS,RANCHI ZONE

SYLLABUS 2016-17

SUBJECT: PHYSICS

Prescribed Text Books

1. Physics for Class-XI (NCERT)
2. Laboratory Manual Physics - Class XI

TERM I		
Month	**Contents**	**Wt.**
JUNE	**Unit I: Physical World and Measurement** 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.	
JULY	**Unit II: Kinematics** 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-tim 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.	**23**
Aug	**Unit III: Laws of Motion** Intuitive concept of force. Inertia, Newton's first law of motion; momentum and Newton' second 19w 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).	
	Unit IV: Work, Energy and Power Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power.	
September	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 ci rcle, elastic collisions and elementary idea of inelastic collisions (in one and two dimensions)	
Revision of 1st SUMMATIVE EXAMINATION		
TERM II		
October	**Unit V: Motion of System of Particles and Rigid Body** 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.)	**17**
November	**Unit V: Motion of System of Particles and Rigid Body** comparison of linear and rotational motions; Moment ofinertia, radius of gyration, values of moments of inertia for simple geometrical objects (no Statement of parallel and perpendicular axes theorem and their applications.	
	Unit VI: Gravitation:	
	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; gravitational potential; Escape velocity, orbital velocity of a satellite, Geostationary satellites.	

December	**Unit VII: Properties of Bulk Matter:** 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 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. 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; Cp & *Cv,* calorimetry; change of state, Latent heat capacity. 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. **Unit - VIII: Thermodynamics** Thermal equilibrium and definition of temperature (zeroth law of therm?dynamics), Heat, work and internal energy; First law of thermodynamics, isothermal and adiabatic processes, Second Law of thermodynamics. Reversible and irreversible processes. Heat engines and refriqerators.	**20**
January	**Unit- IX: Behaviour of Perfect Gas and Kinetic Theory:** 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 of specific heat capacities of gases, concept of mean free path. Avogadro's number. **Unit- X : Oscillations and Waves:** 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.*	**10**
February	Reflection of *waves,* standing *waves* in string and organ pipes, fundamental mode and harmonics. Beats, Doppler effect.	
	Revision and Annual Examination	

BLUE PRINT-1^{sT} SUMMATIVE EXAMINATION
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

II. Weightage to form of Questions:

S.No.	Form of Questions		Marks for each Question	No. of questions	Total Marks
1.	t.ono 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

III. Scheme of Options:

1. There will be no overall option.
2. Internal choices in five questions have been given as follows:
   a. Anyone question in two-mark questions.
   b. Anyone question in three-mark questions.
   c. All the three questions in five-mark questions.

IV. Numericals:

Weightage of nearly 15 marks in total would be assigned to numericals.

V. Weightage to difficulty level of questions:

S.No.	Estimated difficulty level	Percentage	Marks
1.	Easy	(nearly) 15%	11
2.	Averaqe	70%	49
3.	Difficult	(nearly) 15%	10

A weightage of nearly 20% has been assigned to questions which test higher order thinking skills of students.

BLUE PRINT-2nd SUMMATIVE EXAMINATION
Class: XI
Physics

Time: 3 Hrs. Max. Marks: 70

I. Weightage to content/subject units:

S.No	Unit No.	Title	Marks
1.	Unit I	Physical World & Measurement	23
	Unit II	Kinematics	
	Unit III	Laws of Motion	
2.	Unit IV	Work Energy & Power	17
	Unit V	Motion of System of Particles and Rigid Body	
	Unit VI	Gravitation	
3.	Unit VII	Properties of Bulk Matter	20
	Unit VIII	Thermodynamics	
	Unit IX	Behaviour of Perfect qases and Kinetic Theory of Gases	
4.	Unit X	Oscillations and Waves	10
		Total	70

II. 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

III. Scheme of Options:

5. There will be no overall option.
6. Internal choices in five questions have been given as follows:
   a. Anyone question in two-mark questions.
   b. Anyone question in three-mark questions.
   c. All the three questions in five-mark questions.

IV. Numericals:

Weightage of nearly 15 marks in total would be assigned to numericals.

V. Weightage to difficulty level of questions:

S.No.	Estimated difficulty level	Percentage	Marks
1.	Easy	(nearly) 15%	11
2.	Average	70%	49
3.	Difficult	(nearly) 15%	10

A weightage of nearly 20% has been assigned to questions which test higher order thinking skills of students.