SYLLABUS – 2024- 2025

CLASS – **XI**

SUBJECT – **PHYSICS**

Total Marks – 70 **Practical - 30**

COURSE STRUCTURE

Time: 3 hrs. Maximum Marks: 70

UNIT	TOPICS	MARKS
Unit-I	**Physical World and Measurement**	23
	Chapter-2: Units and Measurements	
Unit-II	**Kinematics**	
	Chapter-3: Motion in a Straight Line	
	Chapter-4: Motion in a Plane	
Unit-III	**Laws of Motion**	
	Chapter-5: Laws of Motion	
Unit-IV	**Work, Energy and Power**	17
	Chapter-6: Work, Energy and Power	
Unit-V	**Motion of System of Particles and Rigid Body**	
	Chapter-7: System of Particles and Rotational Motion	
Unit-VI	**Gravitation**	
	Chapter-8: Gravitation	
Unit-VII	**Properties of Bulk Matter**	20
	Chapter-9: Mechanical Properties of Solids	
	Chapter-10: Mechanical Properties of Fluids	
	Chapter-11: Thermal Properties of Matter	
Unit-VIII	**Thermodynamics**	
	Chapter-12: Thermodynamics	
Unit-IX	**Behaviour of Perfect Gases and Kinetic Theory of Gases**	
	Chapter-13: Kinetic Theory	
Unit-X	**Oscillations and Waves**	10
	Chapter-14: Oscillations	
	Chapter-15: Waves	
Total		**70**

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UNIT- I	**PHYSICAL WORLD AND MEASUREMENT**
	Chapter-2: 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.
UNIT- II	**KINEMATICS**
	Chapter-3: Motion in a Straight Line Frame of reference, Motion in a straight line, Elementary concepts of differentiation and integration for describing motion, uniform and non- uniform motion, and instantaneous velocity, uniformly accelerated motion, velocity - time and position-time graphs. Relations for uniformly accelerated motion (graphical treatment).
	Chapter-4: 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. Motion in a plane, cases of uniform velocity and uniform acceleration- projectile motion, uniform circular motion.
UNIT- III	**LAWS OF MOTION**
	Chapter-5: Laws of Motion 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 a banked road).
UNIT- IV	**WORK, ENERGY AND POWER**
	Chapter-6: 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.

UNIT- V	**MOTION OF SYSTEM OF PARTICLES AND RIGID BODY**
	Chapter-7: 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).
UNIT- VI	**GRAVITATION**
	Chapter-8: 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 speed, orbital velocity of a satellite.
UNIT- VII	**PROPERTIES OF BULK MATTER**
	Chapter- 9: Mechanical Properties of Solid Elasticity, Stress-strain relationship, Hooke's law, Young's modules, bulk modules, shear modulus of rigidity (qualitative idea only), Poisson's ratio; elastic energy.
	Chapter-10: 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.
	Chapter-11: Thermal Properties of Matter Heat, temperature, thermal expansion, thermal expansion of solid, 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.
UNIT- VIII	**THERMODYNAMICS**
	Chapter-12: 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.

UNIT- IX	**BEHAVIOR OF PERFECT GATES AND KINETIC THEORY OF CASES**
	Chapter-13: 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.
UNIT- X	**OSCILLATIONS AND WAVES**
	Chapter-14: Oscillations Periodic motion- time period, frequency, displacement as a function of time, periodic functions and their application. Simple harmonic mention (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.
	Chapter-15: 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 organ pipes, fundamental mode and harmonics, Beats.

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SUB- PHYSICS

HALF-YEARLY EXAMINATION: 2024-2025

Time: 3 hrs. Maximum Marks- 70

UNIT	TOPICS	MARKS
Unit-I	**Physical World and Measurement**	40
	Chapter-2: Units and Measurements	
Unit-II	**Kinematics**	
	Chapter-3: Motion in a Straight Line	
	Chapter-4: Motion in a Plane	
Unit-III	**Laws of Motion**	
	Chapter-5: Laws of Motion	
Unit-IV	**Work, Energy and Power**	30
	Chapter-6: Work, Energy and Power	
Unit-V	**Motion of System of Particles and Rigid Body**	
	Chapter-7: System of Particles and Rotational Motion	
Unit-VI	**Gravitation**	
	Chapter-8: Gravitation	
Total		**70**

ANNUAL EXAMINATION: 2024-2025

Time: 3 hrs. Maximum Marks- 70

UNIT	TOPICS	MARKS
Unit-VII	**Properties of Bulk Matter**	24
	Chapter-9: Mechanical Properties of Solids	
	Chapter-10: Mechanical Properties of Fluids	
	Chapter-11: Thermal Properties of Matter	
Unit-VIII	**Thermodynamics**	22
	Chapter-12: Thermodynamics	
Unit-IX	**Behaviour of Perfect Gases and Kinetic Theory of Gases**	
	Chapter-13: Kinetic Theory	
Unit-X	**Oscillations and Waves**	24
	Chapter-14: Oscillations	
	Chapter-15: Waves	
Total		**70**

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HALF-YEARLY EXAMINATION: 2024-2025
BLUE-PRINT OF DISTRIBUTION OF MARKS

Unit	Chapter/ Contents	MCQ (1 Mark)	VSA (1 Mark)	SA (2 Marks)	LA (3 Marks)	VLA (5 Marks)	Total Marks
Unit-I	**Physical World and Measurement** Chapter-2: Units and Measurements	1x1	1x2	2x1	3x1	-	**40**
Unit-II	**Kinematics** Chapter-3: Motion in a Straight Line Chapter-4: Motion in a Plane	1x2	1x3	2x2	3x2	5x1	
Unit-III	**Laws of Motion** Chapter-5: Laws of Motion	1x3	1x2	2x2	3x1		
Unit-IV	**Work, Energy and Power** Chapter-6: Work, Energy and Power	1x2	1x1	2x1	3x1	-	**30**
Unit-V	**Motion of System of Particles and Rigid Body** Chapter-7: System of Particles and Rotational Motion	1x1	1x1	-	3x1	5x1	
Unit-VI	**Gravitation** Chapter-8: Gravitation	1x1	1x1	2x1	3x1	5x1	
Total Question Nos./ Marks		**10/10**	**10/10**	**7/14**	**7/21**	**3/15**	**37/70**

Note:-

1. The above template is only a sample. Suitable internal variation may be made for generating similar templates keeping the overall weightage to different form of questions and typology of question same.
2. 02 (Two) nos. 'Assertion reasoning' type objective questions of weightage 1 Mark may be set.
3. 01 (One) no. 'Comprehension' type question of weightage 3 Marks may be set.

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SUB- PHYSICS

ANNUAL EXAMINATION: 2024-2025
BLUE-PRINT OF DISTRIBUTION OF MARKS

Unit	Chapter/ Contents	MCQ (1 Mark)	VSA (1 Mark)	SA (2 Marks)	LA (3 Marks)	VLA (5 Marks)	Total Marks
Unit- VII	**Properties of Bulk Matter** Chapter-9: Mechanical Properties of Solids Chapter-10: Mechanical Properties of Fluids Chapter-11: Thermal Properties of Matter	1x6	1x6	2x2	3x2	5x1	**46**
Unit- VIII	**Thermodynamics** Chapter-12: Thermodynamics	1x1	1x1	2x1	3x1	5x1	
Unit- IX	**Behaviour of Perfect Gases and Kinetic Theory of Gases** Chapter-13: Kinetic Theory	1x1	1x1	2x1	3x1		
Unit- X	**Oscillations and Waves** Chapter-14: Oscillations Chapter-15: Waves	1x2	1x2	2x3	3x3	5x1	**24**
Total Question Nos./ Marks		**10/10**	**10/10**	**7/14**	**7/21**	**3/15**	**37/70**

Note:-

1. The above template is only a sample. Suitable internal variation may be made for generating similar templates keeping the overall weightage to different form of questions and typology of question same.
2. 02 (Two) nos. 'Assertion reasoning' type objective questions of weightage 1 Mark may be set.
3. 01 (One) no. 'Comprehension' type question of weightage 3 Marks may be set.

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WEIGHTAGE TO TYPE OF QUESTIONS

Type of Questions	Marks (70)	Percentage
1. Multiple Choice Questions (MCQ) (1x10) (Inclusive of Assertion, Reason, Differentiation & Stem)	**10**	**14.29**
2. Very Short Answer Type Questions (VSA) (1x10) (Inclusive of Assertion, Reason, Differentiation & Stem)	**10**	**14.29**
3. Short Answer Type Questions (SA) (2x7) (Knowledge, Understanding, Application, Analysis, Evaluation, Synthesis & Create)	**14**	**20**
4. Long Answer Type Questions (LA) (3x7) (Knowledge, Understanding, Application, Analysis, Evaluation, Synthesis & Create)	**21**	**30**
5. Very Long Answer Type Questions (VLA) (5x3) (Knowledge, Understanding, Application, Analysis, Evaluation, Synthesis & Create)	**15**	**21.43**
	70	**100**

NOTE:-

i) Typology of questions:- MCQ, VSA, Assertion- Reasoning type questions; SA-I, SA-II, LA-I, LA-II, LA- III.

In LA- type questions source-based/ case- study based/ passage based questions may be included.

ii) Approximately 33 % internal choice would be given.

CLASS- XI
SUB- PHYSICS

PRACTICAL

The record, to be submitted by the students, at the time of their Annual Examination, has to include:

- Record of at least 6 Experiments [with 3 from each section], to be performed by the students.
- Record of at least 4 Activities [with 2 each from Section A and Section B], to be performed by the students.
- Report of at least two Projects (given by teacher) carried out by the students.

EVALUATION SCHEME

Time: 3 hours **Maximum Marks: 30**

Topic	Marks
Two experiments one from each section	10+10
Practical Record	3
Attendance	5
Viva on Experiment	2
Total	**30**

SECTION-A

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 and thickness of a given sheet using screw gauge.
3. To determine volume of an irregular lamina using screw gauge.
4. To determine radius of curvature of a given spherical surface by a Spherometer.
5. Using a simple pendulum, plot its L-T^2 graph and use it to find the effective length of second's pendulum.
6. To study variation of time period of simple pendulum of a given length by taking bobs of same size but different masses and interpret the result.

SECTION-B

EXPERIMENTS:

1. To determine Young's modulus of elasticity of the material of a given wire.
2. To determine the surface tension of water by capillary rise method.
3. To determine the coefficient of viscosity of a given viscous liquid by measuring terminal velocity of a given spherical body.
4. To study the relation between frequency and length of a given wire under constant tension using sonometer.

5. To study the relation between the length of a given wire and tension for constant frequency using sonometer.
6. To find the speed of sound in air at room temperature using resonance tube by two resonance positions.

PRESCRIBED BOOKS:

1. Physics Part-1. Textbook for Class XI, Published by NCERT/ SCERT.
2. Physics Part-II, Textbook for Class XI Published by NCERT SCERT.
3. Laboratory Manual of Physics, Class XI Published by NCERT.
4. The list of other related books and manuals brought out by NCERT (consider multimedia also).