Council of Higher Secondary Education, Odisha
PHYSICS
Class XI-XII (2023-24)

Higher Secondary stage of school education is a transition from general education to discipline-based focus on curriculum. The present updated syllabus keeps in view the rigor and depth of disciplinary approach as well as the comprehension level of learners. Due care has also been taken that the syllabus is comparable to the international standards. Salient features of the syllabus include:

- Emphasis on basic conceptual understanding of the content.
- Emphasis on use of SI units, symbols, nomenclature of physical quantities and formulations as per international standards.
- Providing logical sequencing of units of the subject matter and proper placement ofconcepts with their linkage for better learning.
- Reducing the curriculum load by eliminating overlapping of concepts/content within the discipline and other disciplines.
- Promotion of process-skills, problem-solving abilities and applications of Physics concepts.

Besides, the syllabus also attempts to

- Strengthen the concepts developed at the secondary stage to provide firm foundation for further learning in the subject.
- Expose the learners to different processes used in Physics-related industrial and technological applications.
- Develop process-skills and experimental, observational, manipulative, decision making and investigatory skills in the learners.
- Promote problem solving abilities and creative thinking in learners.
- Develop conceptual competence in the learners and make them realize and appreciatethe interface of Physics with other disciplines.

PHYSICS
COURSE STRUCTURE
Class XI – 2023-24 (Theory)

Time: 3 hrs.   **Max Marks: 70**

Unit	Topics	No. of periods	Mark
Unit–I	**Physical World and Measurement**	08	23
	Chapter–2: Units and Measurements		
Unit-II	**Kinematics**	24	
	Chapter–3: Motion in a Straight Line		
	Chapter–4: Motion in a Plane		
Unit–III	**Laws of Motion**	14	
	Chapter–5: Laws of Motion		
Unit–IV	**Work, Energy and Power**	14	17
	Chapter–6: Work, Energy and Power		
Unit–V	**Motion of System of Particles and Rigid Body**	18	
	Chapter–7: System of Particles and Rotational Motion		
Unit-VI	**Gravitation**	12	
	Chapter–8: Gravitation		
Unit–VII	**Properties of Bulk Matter**	24	20
	Chapter–9: Mechanical Properties of Solids		
	Chapter–10: Mechanical Properties of Fluids		
	Chapter–11: Thermal Properties of Matter		
Unit–VIII	**Thermodynamics**	12	
	Chapter–12: Thermodynamics		
Unit–IX	**Behaviour of Perfect Gases and Kinetic Theory of Gases**	08	
	Chapter–13: Kinetic Theory		
Unit–X	**Oscillations and Waves**	26	10
	Chapter–14: Oscillations		
	Chapter–15: Waves		
Total		**160**	**70**

Unit I: **Physical World and Measurement**   **08 Periods**
       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**   **24 Periods**
       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. Relation between associated physical quantities 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**   **14 Periods**
       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, rollingfriction, 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**   **14 Periods**
       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   18 Periods
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   12 Periods
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   24 Periods
Chapter–9: Mechanical Properties of Solids

Elasticity: Stress-strain diagram, Hooke's law, Young's modulus, bulk modulus, shear modulus of rigidity (qualitative idea only), Poisson's ratio; elastic potential 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 pressure across a curved liquid surface, application of surface tension: ideas of liquid drops, bubbles and capillary rise.

Chapter–11: Thermal Properties of Matter

Heat, Temperature, Thermal expansion: thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; C_P, C_V, calorimetry; change of state: idea & definition of latent heat.

Heat transfer: Conduction, Convection and Radiation, thermal conductivity, qualitative ideas of blackbody radiation, Wein's displacement law, Stefan's law .

Unit VIII: Thermodynamics   **12 Periods**
         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 Gases and Kinetic Theory of Gases   08 Periods
         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   **26 Periods**
         Chapter–14: Oscillations

Periodic motion: time period, frequency, displacement as a function of time, periodic functions and their applications.
Simple Harmonic Motion (SHM) and its equations of motion; phase; oscillations of a loaded spring- restoring force and force constant; energy in SHM, 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.

PRACTICALS

Total Periods: 60

The fair practical records are to be submitted by the students at the time of their annual examination. At least 08 experiments are required to be performed by each student.

EVALUATION SCHEME

Time: 3 hours   **Max. Marks: 30**

Topic	Marks
One experiment from the list of experiments outlined below **Theory (2 marks) , Observation/Graph/Circuit diagram/Ray diagram (10 marks) , Calculation & Conclusion (3 marks)**	15 (02+10+03)
Practical record	04
Experiment based conceptual question	05
Viva on experiments	06
Total	**30 marks**

Experiments

1. To measure the diameter of a small spherical / cylindrical body and to measure internaldiameter and depth of a given beaker / calorimeter using Vernier Callipers and hence to find their volumes.

2. To measure the diameter of a given wire and thickness of a given sheet using Screw gauge.

3. To determine the volume of an irregular lamina by using a screw gauge.

4. To determine the radius of curvature of a given spherical surface by a spherometer.

5. To determine the mass of two different objects by using a beam balance.

6. To find the weight of a given body by using parallelogram law of addition of vectors.

7. Using a simple pendulum, plot $L \sim T^2$ graph and use it to find the effective length of second's pendulum.

8. To study the variation of time period of a simple pendulum of a given length by taking bobs of same size but different masses and interpret the result.

9. 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.

10. To find the downward force, along an inclined plane, acting on a roller due to gravitational pull of the earth and study its relationship with the angle of inclination θ by plotting graph between force and sinθ.

11. To determine Young's modulus of elasticity of the material of a given wire.

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

13. To determine the surface tension of water by capillary rise method.

14. To study the relationship between the temperature of a hot body and time by plotting a cooling curve.

15. To determine specific heat capacity of a given solid by method of mixtures.

16. To study the relation between frequency and length of a given wire under constant tension by using a sonometer.

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

18. To find the speed of sound in air at room temperature by using a resonance tube at two resonance positions.

Practical Examination for Visually Impaired students
Class XI

Note: Same Evaluation scheme and general guidelines for visually impaired students as given for Class XII may be followed.

A. **Items for Identification/Familiarity of the apparatus for assessment in practical's (all experiments)**

Spherical ball, Cylindrical objects, vernier calipers, beaker, calorimeter, Screw gauge, wire, Beam balance, spring balance, weight box, gram and milligram weights, forceps, Parallelogram law of vectors apparatus, pulleys and pans used in the same 'weights' used, Bob and string used in a simple pendulum, meter scale, split cork, suspension arrangement, stop clock/stop watch, Helical spring, suspension arrangement used, weights, arrangement used for measuring extension, Sonometer, Wedges, pan and pulley used in it, 'weights' Tuning Fork, Meter scale, Beam balance, Weight box, gram and milligram weights, forceps, Resonance Tube, Tuning Fork, Meter scale, Flask/Beaker used for adding water.

B. **List of Practicals**

1. To measure diameter of a small spherical/cylindrical body using a vernier calipers.

2. To measure the internal diameter and depth of a given beaker/calorimeter using a vernier calipers and hence find its volume.

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

4. To measure thickness of a given sheet using a screw gauge.

5. To determine the mass of a given object using a beam balance.

6. Using a simple pendulum plot $L \sim T^2$ graph; hence find the effective length of second's pendulum using appropriate length values.

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

8. To find the force constant of given helical spring by plotting a graph betweenload and extension.

9 (i) To study the relation between frequency and length of a given wire under constant tension using a sonometer.

   (ii) To study the relation between the length of a given wire and tension, for constant frequency by using a sonometer.

10. To find the speed of sound in air, at room temperature, using a resonance tube, by observing two resonance positions.

Note: Above practicals may be performed in an experiential manner rather than recording the observations.

Prescribed Books:

1. Physics Part-I, Textbook for Class XI, Published by NCERT

2. Physics Part-II, Textbook for Class XI, Published by NCERT

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).

5. Bureau's Higher Secondary (+2) Physics , Published by Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar

CLASS XII (2023-24)
PHYSICS (THEORY)

Time: 3 hrs.   Max Marks: 70

Unit	Topics	No. of periods	Mark
Unit–I	**Electrostatics**	26	16
	Chapter–1: Electric Charges and Fields		
	Chapter–2: Electrostatic Potential and Capacitance		
Unit-II	**Current Electricity**	18	
	Chapter–3: Current Electricity		
Unit-III	**Magnetic Effects of Current and Magnetism**	25	17
	Chapter–4: Moving Charges and Magnetism		
	Chapter–5: Magnetism and Matter		
Unit-IV	**Electromagnetic Induction and Alternating Currents**	24	
	Chapter–6: Electromagnetic Induction		
	Chapter–7: Alternating Current		
Unit–V	**Electromagnetic Waves**	04	18
	Chapter–8: Electromagnetic Waves		
Unit–VI	**Optics**	30	
	Chapter–9: Ray Optics and Optical Instruments		
	Chapter–10: Wave Optics		
Unit–VII	**Dual Nature of Radiation and Matter**	8	12
	Chapter–11: Dual Nature of Radiation and Matter		
Unit–VIII	**Atoms and Nuclei**	15	
	Chapter–12: Atoms		
	Chapter–13: Nuclei		
Unit–IX	**Electronic Devices**	10	7
	Chapter–14: Semiconductor Electronics: Materials, Devices and Simple Circuits		
Total		**160**	**70**

Unit I: **Electrostatics**   **26 Periods**
Chapter–1: Electric Charges and Fields

Electric charges, Conservation of charge, Coulomb's law: electrostatic force between two point charges, forces between multiple charges; superposition principleand continuous charge distribution.

Electric field: electric field intensity, electric field (intensity) due to a point charge, electric field lines, electric dipole, electric field due to a dipole, torque on a dipole placed in a uniform electric field.

Electric flux, statement of Gauss's theorem and its application to find out electric field due to an infinitely long & uniformly charged straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell (field inside and outside).

Chapter–2: Electrostatic Potential and Capacitance

Electric potential, potential difference, electric potential due to a point charge, a dipole and a system of point charges; equi-potential surfaces, electric potential energy of a system of two-point charges and of electric dipole inan electric field.

Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarization, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor (no derivation, formulae only).

Unit II: **Current Electricity**   **18 Periods**
Chapter–3: Current Electricity

Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, V-I characteristics (linear and non-linear), electrical energy and power, electrical resistivity and conductivity, temperature dependence of resistance, internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel, Kirchhoff's rules, Wheatstone bridge.

Unit III: **Magnetic Effects of Current and Magnetism**   **25 Periods**
Chapter–4: Moving Charges and Magnetism

Concept of magnetic field, Oersted's experiment. Biot - Savart law and its application to find the magnetic field near a current carrying circular loop. Ampere's law and its applications to to find the magnetic field near an infinitely long straight wire carrying current. Straight solenoid (only

qualitative treatment).

Force on a moving charge in uniform magnetic and electric fields. Force on a current-carrying conductor in a uniform magnetic field, force between two parallel current-carrying conductors: definition of ampere. Torque experienced by a current loop in uniform magnetic field; Current loopas a magnetic dipole and its magnetic dipole moment.

Moving coil galvanometer: its current sensitivity and conversion to ammeter and voltmeter.

Chapter–5: Magnetism and Matter

Bar magnet: bar magnet as an equivalent solenoid (qualitative treatment only), magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis (qualitative treatment only), torque on a magnetic dipole (bar magnet) in a uniform magnetic field (qualitative treatment only), magnetic field lines.

Magnetic properties of materials- dia- para- and ferro - magnetic materials with examples, Magnetization of materials,effect of temperature on magnetic properties.

Unit IV: Electromagnetic Induction and Alternating Currents   24 Periods
Chapter–6: Electromagnetic Induction

Electromagnetic induction: Faraday's laws; induced emf and current; Lenz's Law, self and mutual induction.

Chapter–7: Alternating Current

Alternating currents, peak and rms value of alternating current / voltage; reactance and impedance; series LCR circuit (phasors only), resonance, power in AC circuits, power factor, watt-less current.
AC generator, Transformer.

Unit V: Electromagnetic waves   04 Periods
Chapter–8: Electromagnetic Waves

Basic idea of displacement current, Electromagnetic waves, their characteristics, transverse nature of e m waves (qualitative idea only). Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.

Unit VI: Optics   30 Periods
Chapter–9: Ray Optics and Optical Instruments

Ray Optics: Reflection of light, spherical mirrors, mirror formula, refraction of light, total internal reflection and optical fibers, refraction at

spherical surfaces, lenses, thin lens formula, lens maker's formula, magnification, power of a lens, combination of thin lenses in contact, refraction of light through a prism.

Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.

Chapter–10: Wave Optics

Wave optics: Wave front and Huygen's principle, reflection and refraction of plane wave at a plane surface using wave fronts. Proof of laws of reflection and refraction using Huygen's principle.

Interference: Young's double slit experiment and expression for fringe width (No derivation; final expression only), coherent sources and sustained interference of light, diffraction due to a single slit, width of central maxima (qualitative treatmentonly).

Unit VII: Dual Nature of Radiation and Matter   **08 Periods**
Chapter–11: Dual Nature of Radiation and Matter

Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation; particle nature of light.
Experimental study of photoelectric effect
Matter waves-wave nature of particles, de-Broglie relation.

Unit VIII: Atoms and Nuclei   **15 Periods**
Chapter–12: Atoms

Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model of hydrogen atom, Expression for radius of nth stationary orbit, velocity and energy of electron in n^{th} orbit, hydrogen line spectra (qualitative treatment only).

Chapter–13: Nuclei

Composition and size of nucleus, nuclear force, Mass-energy relation, mass defect; binding energy per nucleon and itsvariation with mass number; nuclear fission, nuclear fusion.

Unit IX: Electronic Devices   **10 Periods**
Chapter–14: Semiconductor Electronics: Materials, Devices and Simple Circuits

Energy bands in conductors, semiconductors and insulators (qualitative ideas only) Intrinsic and extrinsic semiconductors: p- and n- type, p-n junction
Semiconductor diode: I~V characteristics in forward and reverse bias, application of junction diode: diode as a rectifier.

PRACTICALS

Total Periods 60

The fair practical records are to be submitted by the students at the time of their annual examination. At least 08 experiments are required to be performed by each student.

Evaluation Scheme

Time: 3 hours   **Max. Mark: 30**

Topic	Marks
One experiment from the list of experiments **Theory (2 marks) , Observation/Graph/Circuit diagram/Ray diagram (10 marks) , Calculation& Conclusion(3 marks)**	15 (02+10+03)
Practical record	04
Experiment based conceptual question	05
Viva on experiments	06
Total	**30 marks**

Experiments

1. To determine resistance per unit length of (two / three) given wires by plotting a graph for potentialdifference versus current.

2. To find resistance of a given wire / standard resistor by metre bridge method

3. To verify the laws of combination (series/ parallel) of resistances using a metre bridge.

4. To determine resistance of a galvanometer by half-deflection method and to find its figure of merit.

5. To convert the given galvanometer (of known resistance and figure of merit) into a voltmeter of desired range and to verify the same.

OR

To convert the given galvanometer (of known resistance and figure of merit) into an ammeter of desired range and to verify the same.

6. To find the frequency of AC mains by using a sonometer.

7. To find the value of v for different values of u in case of a concave mirror and to find its focal length.

8. To find the focal length of a convex mirror, by using a convex lens.

9. To find the focal length of a convex lens by plotting graphs between *u* and *v*

   or between *1/u* and *1/v*.

10. To find the focal length of a concave lens, using a convex lens.

11. To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation.

12. To determine refractive index of a glass slab by using a travelling microscope.

13. To draw the reverse characteristic curve for a Zener diode and to determine its breakdown voltage

14. To draw an I~V characteristic curve of a p-n junction diode in forward and reverse biased conditions.

Practical Examination for Visually Impaired students
Class XII
Evaluation Scheme

Time 2 hours   **Max. Marks: 30**

Identification/Familiarity with the apparatus	05 marks
Written test (based on given/prescribed practicals)	10 marks
Practical Record	05 marks
Viva	10 marks
Total	**30 marks**

General Guidelines

I   The practical examination will be of two-hour duration.

II.   A separate list of 8 experiments should be included here.

III.   The written examination in practical for these students will be conducted at the timeof practical examination of all other students.

IV.   The written test will be of 30 minutes duration.

V.   The question paper given to the students should be legibly typed. It should contain   a total of 15 practical skill based very short answer type questions. A student would be required to answer any 10 questions.

VI.   A writer may be allowed to such students as per CHSE examination rules.

VII.   All questions included in the question papers should be related to the listed practicals.Every question should require about two minutes to be answered.

VIII.   These students are also required to maintain a practical file. A student is expected torecord at least five of the listed experiments as per the specific instructions for each subject. These practical should be duly checked and signed by the internal examiner.

IX.   The format of writing any experiment in the practical file should include aim, apparatus required, simple theory, procedure, related practical skills,

precautions etc.

X. Questions may be generated jointly by the external/internal examiners and used for assessment.

XI. The viva questions may include questions based on basic theory/principle/concept, apparatus/ materials/chemicals required procedure, precautions, sources of error etc.

Class XII

A. Items for Identification/ familiarity with the apparatus for assessment in practical (All experiments)

Meter scale, general shape of the voltmeter/ammeter, battery/power supply, connecting wires, standard resistances, connecting wires, voltmeter/ammeter, meter bridge, screw gauge, jockey Galvanometer, Resistance Box, standard Resistance, connecting wires, Potentiometer, jockey, Galvanometer, Lechlanche cell, Daniel cell [simple distinction between the two vis-à-vis their outer (glass and copper) containers], rheostat connecting wires, Galvanometer, resistance box, Plug-in and tapping keys, connecting wires battery/power supply, Diode, Resistor (Wire-wound or carbon ones with two wires connected to two ends), capacitors (one or two types), Inductors, Simple electric/electronic bell, battery/power supply, Plug- in and tapping keys, Convex lens, concave lens, convex mirror, concave mirror, Core/hollow wooden cylinder, insulated wire, ferromagnetic rod, Transformer core, insulated wire.

B. List of Practicals

1. To determine the resistance per cm of a given wire by plotting a graph betweenvoltage and current.

2. To verify the laws of combination (series/parallel combination) of resistances by Ohm's law.

3. To find the resistance of a given wire / standard resistor using a meter bridge.

4. To determine the resistance of a galvanometer by half deflection method.

5. To identify a resistor, capacitor, inductor and diode from a mixed collection of such items.

6. To observe the difference between
   (i) a convex lens and a concave lens
   (ii) a convex mirror and a concave mirror and to estimate the likely difference between the power of two given convex /concave lenses.

7. To design an inductor coil and to know the effect of
   (i) change in the number of turns
   (ii) Introduction of ferromagnetic material as its core material on theinductance of the coil.

8. To design a (i) step up (ii) step down transformer on a given core and know the relation between its input and output voltages.

Note: The above practicals may be carried out in an experiential manner rather than recording observations.

Prescribed Books:

1. Physics, Class XI, Part -I and II, Published by NCERT.
2. Physics, Class XII, Part -I and II, Published by NCERT.
3. Laboratory Manual of Physics for class XII Published by NCERT.
4. The list of other related books and manuals brought out byNCERT (consider multimedia also).
5. Bureau's Higher Secondary (+2) Physics , Published by Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar

QUESTION PAPER DESIGN
Theory (Class: XI/XII)

Maximum Marks: 70   **Duration: 3 hrs.**

S No.	Typology of Questions	Total Marks	Approximate Percentage
1	**Remembering**: Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. **Understanding**: Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas	27	38 %
2	**Applying**: Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	22	32%
3	**Analysing :** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations **Evaluating:** Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. **Creating**: Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.	21	30%
	Total Marks	70	
	Practical	30	
	Gross Total	100	100%

Note: *The above template is only a sample. Suitable internal variations may be made for generating similar templates keeping the overall weightage to different form of questions and typology of questions.*

For more details kindly refer to Sample Question Paper of class XII for the year 2023- 24 to be published by CHSE at its website.