

**PHYSICS XI (Code No. 042) COURSE STRUCTURE**  
**Class XI (Theory) Term 1**

Time: one and half hours.

Max Marks: 35

		No. of Periods	Marks
<b>Unit-I</b>	<b>Physical World and Measurement</b>	<b>6</b>	<b>20</b>
	Chapter-1: Physical World		
	Chapter-2: Units and Measurements		
<b>Unit-II</b>	<b>Kinematics</b>	<b>16</b>	
	Chapter-3: Motion in a Straight Line		
	Chapter-4: Motion in a Plane		
<b>Unit-III</b>	<b>Laws of Motion</b>	<b>10</b>	
	Chapter-5: Laws of Motion		
<b>Unit-IV</b>	<b>Work, Energy and Power</b>	<b>12</b>	<b>15</b>
	Chapter-6: Work, Energy and Power		
<b>Unit-V</b>	<b>Motion of System of Particles and Rigid Body</b>	<b>16</b>	
	Chapter-7: System of Particles and Rotational Motion		
<b>Unit-VI</b>	<b>Gravitation</b>	<b>8</b>	
	Chapter-8: Gravitation		
<b>Total</b>		<b>68</b>	<b>35</b>

**Syllabus assigned for first term**

**Unit I: Physical World and Measurement**

**6 Periods**

**Chapter-1: Physical World**

Physics-scope and excitement; nature of physical laws; Physics, technology and society. (To be discussed as a part of Introduction and integrated with other topics)

**Chapter-2: Units and Measurements**

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 measurement; significant figures.

Dimensions of physical quantities, dimensional analysis and its applications.

**Unit II: Kinematics**

**16 Periods**

**Chapter-3: Motion in a Straight Line**

Elementary concepts of differentiation and integration for describing motion, uniform and non-uniform motion, average speed 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,

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.

**Unit III: Laws of Motion**

**10 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. (Recapitulation only)*

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**

**12 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: conservation of mechanical energy (kinetic and potential energies); 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**

**16 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**

**8 Periods**

**Chapter–8: Gravitation**

Universal law of gravitation. Acceleration due to gravity (recapitulation only) and its variation with altitude and depth.

Gravitational potential energy and gravitational potential, escape velocity, orbital velocity of a satellite, Geo-stationary satellites.

## Class XI (Theory) Term II

Time: 2hrs

Max Marks: 35

Unit		Periods	Marks
<b>Unit-VII</b>	<b>Properties of Bulk Matter</b>	<b>22</b>	<b>23</b>
	Chapter-9: Mechanical Properties of Solids		
	Chapter-10: Mechanical Properties of Fluids		
	Chapter-11: Thermal Properties of Matter		
<b>Unit-VIII</b>	<b>Thermodynamics</b>	<b>10</b>	
	Chapter-12: Thermodynamics		
<b>Unit-IX</b>	<b>Behaviour of Perfect Gases and Kinetic Theory of Gases</b>	<b>08</b>	
	Chapter-13: Kinetic Theory		
<b>Unit-X</b>	<b>Oscillations and Waves</b>	<b>23</b>	<b>12</b>
	Chapter-14: Oscillations		
	Chapter-15: Waves		
	Total Marks	<b>63</b>	<b>35</b>

### Syllabus assigned for Term II

**Unit VII: Properties of Bulk Matter**

**22 Periods**

#### **Chapter-9: Mechanical Properties of Solids**

Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus

#### **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 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, (recapitulation only)* thermal expansion; thermal expansion of solids, 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 (recapitulation only), thermal conductivity, qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law, Greenhouse effect.

**Unit VIII: Thermodynamics****10 Periods****Chapter–12: Thermodynamics**

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

**Unit IX: Behaviour 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****23 Periods****Chapter–14: Oscillations**

Periodic motion - time period, frequency, displacement as a function of time, periodic functions.

Simple harmonic motion (S.H.M) and its equation; 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. Free, forced and damped oscillations (qualitative ideas only), resonance.

**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, Beats

## PRACTICALS

### Syllabus for TERM I

Total Periods: 16

The record, to be submitted by the students, at the time of their First term examination, has to include:

Record of at least 4 Experiments, to be performed by the students

Record of at least 3 Activities [with 3 each from section A and section B], to be demonstrated by teacher.

Time Allowed: One and half hours

Max. Marks: 30

Two experiments one from each section	8Marks
Practical record (experiment and activities)	2Marks
Viva on experiments, and activities	5 Marks
<b>Total</b>	<b>15 Marks</b>

### Syllabus assigned for Practical Term I

#### 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.

**OR**

To determine volume of an irregular lamina using screw gauge.

3. To determine radius of curvature of a given spherical surface by a spherometer.
4. To determine the mass of two different objects using a beam balance.
5. To find the weight of a given body using parallelogram law of vectors.
6. Using a simple pendulum, plot its  $L-T^2$  graph and use it to find the effective length of second's pendulum.

**OR**

To study 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.

7. 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.

**OR**

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  $\theta$  by plotting graph between

force and  $\sin \theta$ .

### Activities

1. To make a paper scale of given least count, e.g., 0.2cm, 0.5 cm.
2. To determine mass of a given body using a metre scale by principle of moments.
3. To plot a graph for a given set of data, with proper choice of scales and error bars.
4. To measure the force of limiting friction for rolling of a roller on a horizontal plane.
5. To study the variation in range of a projectile with angle of projection.
6. To study the conservation of energy of a ball rolling down on an inclined plane (using a double inclined plane).
7. To study dissipation of energy of a simple pendulum by plotting a graph between square of amplitude and time.

### Class XI Syllabus for TERM II

**Total Periods: 16**

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

Record of at least 4 Experiments, to be performed by the students

Record of at least 3 Activities [with 3 each from section A and section B], to be demonstrated by teacher.

**Time Allowed: One and half hours**

**Max. Marks: 30**

Two experiments one from each section	<b>8Marks</b>
Practical record (experiment and activities)	2Marks
Viva on experiments, and activities	<b>5 Marks</b>
<b>Total</b>	<b>15 Marks</b>

### Experiments

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

**OR**

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

2. To study the variation in volume with pressure for a sample of air at constant temperature by plotting graphs between P and V, and between P and  $1/V$ .
3. To determine the surface tension of water by capillary rise method.

**OR**

To determine the coefficient of viscosity of a given viscous liquid by measuring terminal velocity of a given spherical body.

4. To study the relationship between the temperature of a hot body and time by plotting a cooling curve.
5. To determine specific heat capacity of a given solid by method of mixtures.
6. To study the relation between frequency and length of a given wire under constant tension using sonometer.

**OR**

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

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

**Activities**

1. To observe change of state and plot a cooling curve for molten wax.
2. To observe and explain the effect of heating on a bi-metallic strip.
3. To note the change in level of liquid in a container on heating and interpret the observations.
4. To study the effect of detergent on surface tension of water by observing capillary rise.
5. To study the factors affecting the rate of loss of heat of a liquid.
6. To study the effect of load on depression of a suitably clamped metre scale loaded at (i) its end (ii) in the middle.
7. To observe the decrease in pressure with increase in velocity of a fluid.

**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 practicals (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 Practical's**

1. To measure diameter of a small spherical/cylindrical body using vernier calipers.
2. To measure the internal diameter and depth of a given beaker/calorimeter using vernier calipers and hence find its volume.
3. To measure diameter of given wire using screw gauge.
4. To measure thickness of a given sheet using screw gauge.
5. To determine the mass of a given object using a beam balance.
6. To find the weight of given body using the parallelogram law of vectors.
7. Using a simple pendulum plot L-T and L-T<sup>2</sup> graphs. Hence find the effective length of second's pendulum using appropriate length values.
8. To find the force constant of given helical spring by plotting a graph between load 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, using a sonometer.
10. To find the speed of sound in air, at room temperature, using a resonance tube, by observing the two resonance positions.

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



**Physics Class XII (Code N. 042) (2020-21)**  
**Syllabus assigned for Term I (Theory)**

**Time: 90 Minutes**

**Max Marks: 35**

		No. of Periods	Marks
<b>Unit-I</b>	<b>Electrostatics</b>	<b>23</b>	<b>17</b>
	Chapter-1: Electric Charges and Fields		
	Chapter-2: Electrostatic Potential and Capacitance		
<b>Unit-II</b>	<b>Current Electricity</b>	<b>15</b>	<b>18</b>
	Chapter-3: Current Electricity		
<b>Unit-III</b>	<b>Magnetic Effects of Current and Magnetism</b>	<b>16</b>	
	Chapter-4: Moving Charges and Magnetism		
	Chapter-5: Magnetism and Matter		
<b>Unit-IV</b>	<b>Electromagnetic Induction and Alternating Currents</b>	<b>19</b>	
	Chapter-6: Electromagnetic Induction		
	Chapter 7: Alternating currents		
<b>Total</b>		<b>73</b>	<b>35</b>

**Unit I: Electrostatics**

**23 Periods**

**Chapter-1: Electric Charges and Fields**

Electric Charges; Conservation of charge, Coulomb's law-force between two-point charges, forces between multiple charges; superposition principle and continuous charge distribution. Electric field, electric field due to a point charge, electric field lines, electric dipole, electric field due to a dipole, torque on a dipole in uniform electric field. Electric flux, statement of Gauss's theorem and its applications to find field due to infinitely long straight wire, uniformly charged infinite plane sheet

**Chapter-2: Electrostatic Potential and Capacitance**

Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges; equipotential surfaces, electrical potential energy of a system of two-point charges and of electric dipole in an electrostatic field. Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation, 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.

**Unit II: Current Electricity**

**15 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, electrical resistance, 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 laws and simple applications, Wheatstone bridge, metre bridge(**qualitative ideas only**). Potentiometer - principle and its applications to measure potential difference and for comparing EMF of two cells; measurement of internal resistance of a cell (**qualitative ideas only**)

### **Unit III: Magnetic Effects of Current and Magnetism**

**16 Periods**

#### **Chapter–4: Moving Charges and Magnetism**

Concept of magnetic field, Oersted's experiment. Biot - Savart law and its application to current carrying circular loop. Ampere's law and its applications to infinitely long straight wire. Straight and toroidal solenoids (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; moving coil galvanometer-its current sensitivity and conversion to ammeter and voltmeter.

#### **Chapter–5: Magnetism and Matter**

Current loop as a magnetic dipole and its magnetic dipole moment, magnetic dipole moment of a revolving electron, bar magnet as an equivalent solenoid, magnetic field lines; earth's magnetic field and magnetic elements.

### **Unit IV: Electromagnetic Induction and Alternating Currents**

**19 Periods**

#### **Chapter–6: Electromagnetic Induction**

Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Eddy currents. Self and mutual induction.

#### **Chapter–7: Alternating Current**

Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; LC oscillations (qualitative treatment only), LCR series circuit, resonance; power in AC circuits. AC generator and transformer.

## Syllabus assigned for Practical for Term I

**Total Periods:16**

First term practical examination will be organised by schools as per the directions of CBSE. The record to be submitted by the students at the time of first term examination has to include a record of at least 4 Experiments and 3 Activities to be demonstrated by teacher.

**Time Allowed: one and half hours**

**Max. Marks: 15**

Two experiments to be performed by students at time of examination	<b>8 marks</b>
Practical record [experiments and activities]	<b>2 marks</b>
Viva on experiments, <b>and</b> activities	<b>5 marks</b>
<b>Total</b>	<b>15 marks</b>

### Experiments assigned for Term I

1. To determine resistivity of two / three wires by plotting a graph between potential difference versus current.
2. To find resistance of a given wire / standard resistor using metre bridge.

**OR**

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

**OR**

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

3. To compare the EMF of two given primary cells using potentiometer.

**OR**

To determine the internal resistance of given primary cell using potentiometer.

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 with a sonometer.

### Activities assigned for Term I

1. To measure the resistance and impedance of an inductor with or without iron core.
2. To measure resistance, voltage (AC/DC), current (AC) and check continuity of a given circuit using multimeter.
3. To assemble a household circuit comprising three bulbs, three (on/off) switches, a fuse and a power source.
4. To assemble the components of a given electrical circuit.
5. To study the variation in potential drop with length of a wire for a steady current.
6. To draw the diagram of a given open circuit comprising at least a battery, resistor/rheostat, key, ammeter and voltmeter. Mark the components that are not connected in proper order and correct the circuit and also the circuit diagram.

## Class XII Syllabus assigned for Term II (Theory)

**Time: 2 Hours**

**Max Marks: 35**

		No of Periods	Marks
<b>Unit–V</b>	<b>Electromagnetic Waves</b>	<b>02</b>	<b>17</b>
	Chapter–8: Electromagnetic Waves		
<b>Unit–VI</b>	<b>Optics</b>	<b>18</b>	
	Chapter–9: Ray Optics and Optical Instruments		
	Chapter–10: Wave Optics		
<b>Unit–VII</b>	<b>Dual Nature of Radiation and Matter</b>	<b>07</b>	
	Chapter–11: Dual Nature of Radiation and Matter		
<b>Unit–VIII</b>	<b>Atoms and Nuclei</b>	<b>11</b>	
	Chapter–12: Atoms		
	Chapter–13: Nuclei		
<b>Unit–IX</b>	<b>Electronic Devices</b>	<b>07</b>	<b>7</b>
	Chapter–14: Semiconductor -Electronics: Materials, Devices and Simple Circuits		
<b>Total</b>		<b>45</b>	<b>35</b>

### **Unit V: Electromagnetic waves**

**2 Periods**

#### **Chapter–8: Electromagnetic Waves**

Electromagnetic waves, their characteristics, their Transverse nature (qualitative ideas only).

Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.

### **Unit VI: Optics**

**18Periods**

#### **Chapter–9: Ray Optics and Optical Instruments**

**Ray Optics:** Refraction of light, total internal reflection and its applications, optical fibers, refraction at spherical surfaces, lenses, thin lens formula, lensmaker'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, coherent sources and

sustained interference of light, diffraction due to a single slit, width of central maximum

**Unit VII: Dual Nature of Radiation and Matter**

**7 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**

**11Periods**

**Chapter–12: Atoms**

Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum.

**Chapter–13: Nuclei** Composition and size of nucleus Nuclear force Mass-energy relation, mass defect, nuclear fission, nuclear fusion.

**Unit IX: Electronic Devices**

**7 Periods**

**Chapter–14: Semiconductor Electronics: Materials, Devices and Simple Circuits** Energy bands in conductors, semiconductors and insulators (qualitative ideas only) Semiconductor diode - I-V characteristics in forward and reverse bias, diode as a rectifier; Special purpose p-n junction diodes: LED, photodiode, solar cell.

**Syllabus assigned for Practical for Term II**

**Total Periods: 16**

The second term practical examination will be organised by schools as per the directions of CBSE and viva will be taken by both internal and external observers. The record to be submitted by the students at the time of second term examination has to include a record of at least 4 Experiments and 3 Activities to be demonstrated by teacher.

**Evaluation Scheme**

**Time Allowed: one and half hours**

**Max. Marks: 15**

Two experiments to be performed by students at time of examination	<b>8 marks</b>
Practical record [experiments and activities]	<b>2 marks</b>
Viva on experiments, <b>and</b> activities	<b>5 marks</b>
<b>Total</b>	<b>15 marks</b>

### Experiments assigned for Term-II

1. To find the focal length of a convex lens by plotting graphs between  $u$  and  $v$  or between  $1/u$  and  $1/v$ .
2. To find the focal length of a convex mirror, using a convex lens.

OR

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

3. To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation.
4. To determine refractive index of a glass slab using a travelling microscope.
5. To find refractive index of a liquid by using convex lens and plane mirror.
6. To draw the I-V characteristic curve for a p-n junction diode in forward bias and reverse bias.

### Activities assigned for Term-II

1. To identify a diode, an LED, a resistor and a capacitor from a mixed collection of such items.
2. Use of multimeter to see the unidirectional flow of current in case of a diode and an LED and check whether a given electronic component (e.g., diode) is in working order.
3. To study effect of intensity of light (by varying distance of the source) on an LDR.
4. To observe refraction and lateral deviation of a beam of light incident obliquely on a glass slab.
5. To observe polarization of light using two Polaroids.
6. To observe diffraction of light due to a thin slit.
7. To study the nature and size of the image formed by a (i) convex lens, (ii) concave mirror, on a screen by using a candle and a screen (for different distances of the candle from the lens/mirror).
8. To obtain a lens combination with the specified focal length by using two lenses from the given set of lenses.

### Practical Examination for Visually Impaired Students of XII Evaluation Scheme (Term I and Term II)

Time Allowed: one hour

Max. Marks:15

Identification/Familiarity with the apparatus	3 marks
Written test (based on given/prescribed practicals)	5 marks
Practical Record	2 marks
Viva	5 marks
<b>Total</b>	<b>15 marks</b>

## **General Guidelines**

- The practical examination will be of one hour duration.
- A separate list of ten experiments is included here.
- The written examination in practicals for these students will be conducted at the time of practical examination of all other students.
- The written test will be of 10 minutes duration.
- The question paper given to the students should be legibly typed. It should contain a total of 8 practical skill based very short answer type questions. A student would be required to answer any 5 questions.
- A writer may be allowed to such students as per CBSE examination rules.
- All questions included in the question papers should be related to the listed practicals. Every question should require about two minutes to be answered.
- These students are also required to maintain a practical file. A student is expected to record at least five of the listed experiments as per the specific instructions for each subject. These practicals should be duly checked and signed by the internal examiner.
- The format of writing any experiment in the practical file should include aim, apparatus required, simple theory, procedure, related practical skills, precautions etc.
- Questions may be generated jointly by the external/internal examiners and used for assessment.
- The viva questions may include questions based on basic theory/principle/concept, apparatus/ materials/chemicals required, procedure, precautions, sources of error

## **Class XII**

### **A. Items for Identification/ familiarity with the apparatus for assessment in practicals (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, Daniell 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.

### Experiments assigned for Term-I

1. To determine the resistance per cm of a given wire by plotting a graph between voltage 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 compare the e.m.f of two given primary cells using a potentiometer.
5. To determine the resistance of a galvanometer by half deflection method.

### Experiments assigned for Term-II

- 1 To identify a resistor, capacitor, inductor and diode from a mixed collection of such items.
- 2 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.
- 3 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 the inductance of the coil.
- 4 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 XII, Part -I and II, Published by NCERT.
2. Laboratory Manual of Physics for class XII Published by NCERT.
3. The list of other related books and manuals brought out by NCERT (consider multimedia also).