SCIENCE - PHYSICS - STD X - UNIT -1 - MECHANICS AND PROPERTIES OF MATTER - 12 PERIODS

Expected specific outcomes of learning	Content in Terms of Concepts	Curriculum Transactional Strategies	Illustrations	Evaluation	No.of Periods allotted
1	2	3	4	5	6
Understands free fall and projectile motion	1.1 Free Fall and projectile motion with initial horizontal velocity	Analyses of free fall and projectile motion	Compares the motion of a freely falling body and a horizontally thrown projectile	Why a stone released from a moving train follows a parabolic path?	2
Understands circular motion and identifies centripetal and centrifugal forces.	1.2 Uniform circular motion, application of centrifugal force.	Explains forces in circular motion Demonstrates circular motion by whirling a stone tied to a string. Demonstrates the centrifugal force by rapidly rotating bucket with water.	Lists out application of centrifugal reactions - Watt Governor, drying machine, centrifuge, banking of curves	Why high way road curves are banked?	2
Understands the gravitational force	1.3 Gravitation - Kepler's laws of plantery motion - Newton's law of gravitation.	Explains the Kelper's laws of planetary motion and deduces Newton's law of gravitation.	Lists out the planets with the distances from the sun and their orbital periods and velocities	At what positions in their orbit around the sun, velocity of planet be a maximum and minimum?	2

Expected specific outcomes of learning	Content in Terms of Concepts	Curriculum Transactional Strategies	Illustrations	Evaluation	No.of Periods allotted
1	2	3	4	5	6
Understands surface tension and appreciates its application	1.4 Surface tension - capillary rise	Defines and explains surface tension on the basis of molecular theory. Illustrates surface tension with experiments.	Lists out the applications of surface tension in everyday life.	Explain the cleaning action of detergents. Explain the action of blotting paper, oil wick and pen nib. Explain how water raises up inplants.	2
Understands viscosity of fluids and their applications	1.5 Viscosity - flow of liquid through a pipe importance of viscosity	Explains the application of viscous fluids in daily life.	Explains the role of viscosity in circulation of blood through arteries and veins of human body.	Identify where the velocity of water flow is maximum and minimum in a pipe/river	2
Understands the Bernoulli's theorem and its applications	1.6 Bernoull's theorem and its applications.	Explains and demonstrates Bernoull's - theorem with (i) paper strip, (ii) polythene tube and thermocole balls (iii) funnel and ping-pong ball.	Demonstrates the reduction in pressure by blowing air over one end of manometer.	Explain how does aeroplanes fly. Explain the working of Bunsen burner.	2

SCIENCE - PHYSICS - STD X - UNIT 2 - HEAT - 12 PERIODS

1	2	3	4	5	6
Understands specific heat capacities of substances.	2.1 Heat - Specific heat capacity	Demonstrates that heat capacities are different for different substances	Lists out specific heat capacities of common substances	Define specific heat capacity of a substance.	1
Applies the method of mixtures to find specific heat capacities of solids and liquids	2.2 Computes heat lost or gained by method of mixtures	Explains the method of mixtures	Computes the specific heats of solids and liquids using method of mixtures	Water is preferred as a coolant. Why?	2
Relates mechanical energy to heat energy	2.4 Mechanical equivalent of Heat	Explains mechanical equivalent of heat - Joule's apparatus	Computes heat energy produced when a weight of 0.5kg is dropped 1.5m to the floor.	Why do substances expand on heating?	1
Understands linear and volume expansion of solids	2.4 Thermal expansion - co-efficient of linear and volume expansion	Defines coefficient of linear and volume expansion. Demonstrates working of bimetallic strip and thermostat	Lists out advantages and disadvantages of linear expansion of solids in everyday life. Makes simple circuit using bimetallic strip as a switch.	Why gaps are left in bridges, railway lines and concrete highways? Give examples for thermal expansion and contraction in daily life.	2
Appreciates role of heat in change of state	2.5 Change of state latent heat-cooling due to evaporation - principle of	Demonstrates change of states with ice and wax and comments on results.	Represents graphically the change of states of ice and wax	List out melting and boiling points of some common substances. Which produces more	2

1	2	3	4	5	6
	refrigerators			severe burns - boiling water or steam? Explain	
Appreciates latent heat of fusion and vaporization	2.6 Latent heats of fusion and vaporization	Explains how latent heats of fusion and vapourization are determined	Lists out latent heats of fusion and vaporization of some common materials.	Why is ice at 0?C more effective in cooling than water at 0?C?	2
Appreciates variation of boiling and melting points with pressure and impurities	2.7 Variation of boiling and melting points with pressure - freezing mixture.	Demonstrates increase of boiling point under increased pressure. Demonstrates lowering of melting point under increased pressure (regelation experiment)	Explains the principle of pressure cooker. Explains the principle of ice skating, sledge and snow dolls.	Why cooking takes longer time in hill stations?	1
Appreciates the humidity and relative humidity of the atmosphere	2.8 Humidity and relative humidity	Defines humidity and relative humidity	Tabulates how the mass of water in 1 cubic meter of air changes with temperature	Why do we feel sultry in rainy days and in coastal areas?	1

SCIENCE - PHYSICS - STD X - UNIT 3 - LIGHT - 12 PERIODS

1	2	3	4	5	6
Understands the laws of refraction of light.	3.1 Refraction of light- laws of refraction, refraction through a glass slab and a prism determination of R.I Raising effect of refraction.	Explains the laws of refraction of light. Defines refractive index in terms of angle of incidence and angle of refraction -Snell's law Demonstrates how objects appear raised due to refraction of light using a glass slab/bowel of water.	Draws the path of light ray inside a glass slab/prism using pin method and hence finds R.I.	Define refractive index of a material. The apparent depth of an object seen through a glass slab of R.I. 1.5 is 4 cm. Calculate the actual depth.	4
Appreciates the critical angle and total internal reflection.	Critical angle and total internal refection - totally reflecting prism	Explains critical angle for a ray of light entering rarer medium from a denser medium.	Estimates the critical angle and R.I. of common substances	Calculate the critical angle for glass (RI = 1.5) and water (RI = 1.33).	

1	2	3	4	5	6
Appreciates bending of light by spherical lenses. Understands the relation between u,v and f and forms images for various positions of objects. Applies knowledge of refraction to explain some optical phenomena and the working of optical instruments.	3.2 Refraction of light-image formation by convex and concave lenses, lens formula, sign convention, power of a lens-twinkling of stars, mirage. 3.3 Optical instruments construction and working of a compound microscope and astronomical telescope	Graphically constructs images formed by convex and concave lenses for various positions of objects. Measures linear magnification and power of lenses. Explains mirage, twinkling of stars and the working of compound microscope and astronomical telescope	Lists out the position and nature of image in camera and cinema projector. Tabulates the nature of images produced by convex and concave lenses for various positions of objects. Makes a compound microscope and an astronomical telescope and explores their features.	Name the unit of power of a lens Obtain the relation between u,v and f for a lens. What is the difference between a real and a virtual image? What is the nature of images produced by a compound microscope and an astronomical telescope?	4
Appreciates dispersion of white light by glass prism. Understands the composition of white light and colours of objects. Identifies the primary colours of light and pigments and effects of superposition of	3.4 Dispersion of light dispersion of white light by glass prism - composition of white light - colours of objects and pigments - primary colours of light and pigments, superposition of light of primary colours.	Demonstrates dispersion of white light by glass prism. Explains the composition of white light and colours of objects and pigments. Tabulates the colours produced by superposition of light of primary colours	Explores the colours produced by mixing pigments of primary colours. A ball is seen through a piece of red glass. What will be the actual colour of the ball?	Which colour of light gets deviated the most by a glass prism? Explain how a rainbow is produced? What are colours seen in a rainbow?	4

1	2	3	4	5	6
light of primary colours.					

SCIENCE - PHYSICS - STD X - UNIT - 4 ELECTRICITY AND ITS EFFECTS - 14 PERIODS

1	2	3	4	5	6
Recognizes electric field, potential difference and current.	4.1 Electric field-potential and potential difference - electric current.	Explains electric lines of force and electric field.	Distinguishes between potential and potential differences.	Define potential and current What are their units?	1
Understands Ohm's law	4.2 Ohm's law - combination of resistances	Explains current and electrical resistance	Verifies Ohm's law using simple circuits.	Calculate the resistance of a device when a current of 0.5A flow through a bulb operating at 220V	1
Computes the effective resistance. Appreciates heating effects of current Computes the electrical power consumption.	4.3 Heating effects - Heating effects of current - applications. Power - commercial unit of electrical energy.	Calculates the effective resistance of resistors in series and parallel. Tabulates devices using heating effects of electricity - electric heater, electric iron, filament bulb, safety fuse. Explains electrical power and energy	Lists out devices using the heating effects of current in daily life. Tabulates the power consumed by common house-hold appliances Makes simple calculation of electrical power used in houses.	Explain the working of an electric bulb and electric heater, What is the function of safety fuse in electrical circuits? A 2 kW stove is switched on for 6 hours. Calculate electrical power consumed.	2
Understands electrolysis and laws of electrolysis. Appreciates the applications of electrolysis- electroplating, purifying metals and manufacture of chemicals.	4.4 Chemical effects - Electrolysis- Faraday's laws -electroplating - electrochemical cells - drycells	Demonstrates electrolysis and explains the laws of electrolysis. Explains electroplating of metals - copper, silver and gold plating. Passes dc through copper sulphates solution with copper plates.	Tabulates the plates and electrolytes used for gold and silver plating of metals.	Explain the terms: anode and cathode Give an experiment to illustrate the chemical effect of electricity.	2

1	2	3	4	5	6
Appreciates the magnetic field associated with current carrying conductors	4.5 Magnetic effects - Magnetic field due to current carrying conductors - straight, coil and solenoid	Demonstrates magnetic fields around a straight wire, a coil and a solenoid. Explains Ampere's swimming rule and Maxwell's corkscrew rule.	Observes the magnetic field due to current in a wire using cardboard and iron filings	State Ampere's swimming rule	1
Understands the working of microphone and loud speaker	4.6 Electromagnets - microphone, loud speaker	Explains the working of a microphone and a loud speaker	Observes the working of microphone and loud speaker	Name some common devices in which electromagnets are used	1
Understands the mechanical force on a current carrying conductor in a magnetic field.	4.7 Mechanical force on a current carrying conductor placed in a magnetic field- Fleming's left hand rule-moving coil meter	Demonstrates the mechanical force on a current carrying wire in a magnetic field-Barlow's Wheel	Recognizes the directions of force on a current carrying conductor in a magnetic field with Fleming's left hand rule	State Fleming's left hand rule and give its applications	2

1	2	3	4	5	6
Understands induced emf, Faraday's law, Lenz's law and Fleming's right hand rule	4.8 Electromagnetic induction - Faraday's laws-Lenz's law - Fleming's right hand rule	Demonstrates Faraday's and Lenz's laws with a magnet and a coil Explains electromagnetic induction with a coil of wire and magnet. Explains the working of a cycle dynamo	Demonstrates electromagnetic induction by moving a magnet inside a coil of wire connected to a galvanometer. Observes the change in direction of current when the poles and direction of movement of magnet are changed	When is Fleming's right-hand rule used? When is Fleming's left-hand rule used?	1
Appreciates the working of AC and DC generators and transformer	4.9 AC Generator - DC Generator - Step - up and step-down transformer.	Explains Fleming's right hand rule and motor, AC and DC generators. Demonstrates step-up and step-down transformers. Relates the voltages and number of turns in the primary and secondary coils.	Makes a simple transformer and observes its features. Explains the importance of transformer in electric power distribution.	What are the uses of transformers? Why AC is the preferred for power distribution? Explain the principle and working of a dynamo	2
Appreciates domestic electric circuits and safety measures	4.10 Domestic electric circuits - Safety measures in handling electricity - fuse and	Demonstrates the domestic electric circuits and safety measures.	Demonstrates the functioning of electrical fuse.	What is the function of a fuse in an electric circuit?	1

1	2	3	4	5	6
	earthing - electrocution.	Explains the need for earthing and fuses.		Why earthing is essential for electrical appliances having metal cases?	

SCIENCE - PHYSICS - STD X - UNIT 5 - ATOMIC AND NUCLEAR PHYSICS - 10 PERIODS

1	2	3	4	5	6
Understands the features of electro magnetic spectrum Appreciates the production and application as X-rays, Infrared, microwaves and radiowaves	5.1 Electromagnetic radiation - electromagnetic spectrum X-rays-production properties and uses. Application of infrared, microwaves and radiowaves	Explains and classifies electromagnetic radiation in terms of wavelength, frequency and energy using charts. Lists out the properties of electromagnetic radiation. Illustrates the application of microwaves and radiowaves for radio and TV	Lists out different types of electromagnetic radiation with their properties and uses. Lists out the industrial, medical and scientific applications X-rays and infrared. Explains the uses of microwaves and radiowaves for radio and TV	What is the wavelength range as visible region of electromagnetic spectrum? What is the wave length of X-rays ? How are infrared radiation produced ? Name one important source of all types of electromagnetic radiations.	3
Recognises radioactive material and Understands different types of radioactive radiations.	5.2 Radioactivity - ? ß ? rays - properties - radio isotopes and their applications	Lists out radioactive materials, radio isotopes and their applications.	Tabulates the properties of ? ß, ? rays	How are ? ß ? rays detected ? Of ? , ß, ? radiations which one ? a) travels at greater speed? b) carries negative charge? c) is not deflected by electric of magnetic fields? d) is similar in nature of	3

1	2	3	4	5	6
				x-rays?	
Appreciates production of nuclear energy	5.3 Nuclear fission and nuclear fusion - chain reaction - Nuclear reactors	Explains fission, fusion and controlled chain reaction.	Illustrates different parts of nuclear reactor and their functions.	What is chain reaction? Why moderator and control rods are used in a nuclear reactor?	2
Recognises the importance of nuclear energy and safety measures.	5.4 Advantages and hazards of nuclear energy - safety measures.	Tabulates the advantages and hazards of nuclear energy Gives an account of Indian nuclear energy programme	Lists out the precautionary measures to be adopted by people living near nuclear plants	Why workers in nuclear power station wear badges with photographic plates?	2