FORM THREE

	WEEKS	TOPICS	CONTENT	ATTAINMENT TARGETS
1.0 PROPERTIES OF MATTER				
FIRST SEQUENCE	WEEK 1	**1.1 Physical quantities**	• Meaning of a physical quantity • Units	a) Understand the meaning of a physical quantity and a unit. b) Show an understanding that physical quantities consist of a numerical magnitude and a unit.
	WEEK 2	**1.2 Density**	• Definition of density • Units	a) Define density and state its units. b) Use the formula $\rho = \frac{m}{V}$ in simple calculations. c) Understand the meaning of average density. d) Appreciate the use of materials of different densities in engineering works.
	WEEK 3	**1.3 measurement of density**	• Measuring the density of a solid • Measuring the density of a liquid	a) Describe experiments to measure the density of a regularly-shaped solid, an irregularly shaped solid a liquid. b) Do appropriate calculations.
	WEEK 4	**1.4 Pressure**	• Definition and units • Factors affecting pressure • Pressure in fluids	a) Define pressure and state its units. b) Use the formula $P = \frac{F}{A}$ in simple calculations. c) Understand the effects of force and area on pressure and explain some applications. d) State and explain the characteristics of fluid pressure. e) Do calculations using the relationship $\Delta P = \rho gh$ f) Appreciate the transmission of pressure in fluids
	WEEK 5	**1.5 Atmospheric pressure**	• Demonstration of atmospheric pressure • Manometer	a) State the factors affecting atmospheric pressure. b) Describe experiments to demonstrate atmospheric pressure e.g. the collapsing-can experiment. c) Understand the uses of the simple manometer and do simple calculations on it. d) Appreciate the relationship between pressure and weather. e) Understand the units of measuring atmospheric pressure. f) List and explain hazards of high altitude and deep sea diving.

	WEEK 6	**Revision**		- Revise and write first sequence evaluation
SECOND SEQUENCE	WEEK 7	**1.6 Hooke's Law**	• Statement of the law • Applications	a) Identify elastic materials and define elasticity. b) State Hooke's law c) Define elastic limit. d) Give examples of materials that obey Hooke's law. e) Sketch force-extension graphs within elastic limit. f) Do simple calculations on Hooke's law. g) Describe situations in which Hooke's law applies.
	2.0 ENERGY			
	WEEK 8	**2.1 Work and energy**	• Meaning of work. • Meaning of energy • Forms of energy • Principle of conservation of energy	a) Appreciate that work is done when a force moves its point of application through a distance in its direction. b) State the units of work. c) Do simple calculations involving force and displacement (in the same direction only) d) Define energy and state its SI units. e) State the relationship between work and energy. f) Name and explain the different forms of energy. g) State the law of conservation of energy and describe some energy conversions.
	WEEK 9	**2.2 Work and energy**	• Potential energy and kinetic energy • Power	a) Calculate gravitational potential energy using the formula *p.e.* = *mgh* and kinetic energy using the formula k.e. = $\frac{1}{2}mv^2$. b) Describe energy conversions in stretching of springs, rubber bands and threads. c) Define power and state its units. d) Estimate the average power developed by e.g. a person running upstairs, a person repeatedly lifting weights, etc. e) Appreciate the power ratings of devices e.g. light bulbs, motors etc. f) Do appropriate calculations.

	WEEK 10	**2.3 Work and energy**	• Sources of energy	a) Name different sources of energy and describe how functional energy is obtained from each. b) Distinguish between renewable and non-renewable sources of energy.
	WEEK 11	**2.4 Machines**	• Related terminology	a) Define a machine and state the advantages of using machines. b) Define M.A., V.R., and efficiency as used in machines. c) Explain why a machine is never 100% efficient.
	WEEK 12	Revision		Revise and compose second sequence evaluation.
THIRD SEQUENCE	WEEK 13	**2.5 Some simple machines**	• Lever • Pulley • Inclined plane	a) Describe simple experiments using each machine. b) Do appropriate calculations. c) Describe the use of various machines at a building site.
	3.0 LIGHT			
	WEEK 14	**3.1 Reflection of light**	• Types of reflection • Laws of reflection	a) Represent the paths of narrow beams of light travelling in uniform media by rays. b) Appreciate that an object is seen because light from it enters the eye. c) Distinguish between regular and irregular reflection. d) State the laws of reflection with appropriate ray diagrams.
	WEEK 15	**3.2 Mirrors**	• Plane mirrors • Curved mirrors	a) Describe three types of mirrors b) Construct ray diagrams to show the formation of images by plane mirrors. c) State the characteristics of the image formed by a plane mirror. d) State particular applications of a concave mirror, a convex mirror and a plane mirror.

	WEEK 16	**3.3 Refraction of light**	• Definition of refraction at a plane surface • Laws of refraction • Refractive index	a) Define refraction and identify refraction phenomena in everyday life. b) Draw ray diagrams illustrating refraction c) State the laws of refraction d) Define refractive index and use the formula Refractive index, $n = \frac{\sin i}{\sin r} = \frac{c}{v} = \frac{\text{real depth}}{\text{apparent depth}}$ in simple calculations. e) Describe an experiment to verify Snell's law and determine the refractive index of glass using a glass block.
	WEEK 17	**3.4 Refraction of light**	• Effects of refraction	a) Be familiar with the refraction of light in everyday phenomena e.g. the apparent depth of a swimming pool, the bending of a stick partially immersed in water, etc. b) Describe an experiment to measure the refractive index of a liquid.
	WEEK 18	Revision		- Revise and compose for third sequence evaluation
FOURTH SEQUENCE	WEEK 19	**3.5 Total internal reflection**	• Meaning of total internal reflection • Applications	a) Draw, with the aid of ray diagrams, what total internal reflection means. b) Define critical angle. c) Appreciate the conditions for total internal reflection to occur. d) Appreciate the bending of light and total internal reflection in prisms. a) Use the formula $\sin C = \frac{1}{n}$.
	WEEK 20	**3.6 Dispersion**	• Meaning of dispersion • Pure and impure spectrum	b) Define the term 'dispersion' and explain why it occurs. c) Describe the formation of a pure spectrum and an impure spectrum. d) Name and explain natural phenomena due to the dispersion of light.

	WEEK 21	**3.7 Lenses**	• Types of lenses • Definition of related terms	a) Identify types of lenses b) Define the terms i. Principal axis ii. Optical centre iii. Principal focus and iv. Focal length, as used in lenses (with the help of ray diagrams) c) Regard a lens as being made up of a number of part prisms.
	WEEK 22	**3.8 Image formed by lenses**	• Formation of images • applications	a) Explain how a lens forms images. b) Draw ray diagrams to illustrate the formation of images by a lens with the image placed at different positions in front of the lens. c) Give the characteristics of the image at each position and some practical applications.
	WEEK 23	**3.9 Image formed by lenses**	• Lens formula • Linear magnification • The simple lens camera • The human eye	a) Define linear magnification. b) State and use the lens formula. c) Describe the structure of a simple lens camera and the human eye and compare their optical properties.
	WEEK 24	Revision		- Revise and compose for fourth sequence evaluation

FIFTH SEQUENCE	WEEK 25	**3.10 Experiments with lenses**	• Measurement of focal length	a) Describe experiments relating object and image distances to object and image sizes for converging lenses. b) Describe how to measure the focal length of a converging lens using a distant-object method and an auxiliary plane mirror method.
	4.0 HEAT			
	WEEK 26	**4.1 Concept of heat and temperature**	• Concept of heat • Temperature	a) Explain the concept of heat in terms of internal energy of a body. b) State the S.I. units of heat. c) Define temperature and state its units. d) Relate heat and temperature. e) Apply different temperature scales (Celsius and Kelvin) f) Convert temperature from Celsius to Kelvin and vice-versa.
	WEEK 27	**4.2 Calibrating a thermometer**	• Thermometric substance • Thermometric property • Fixed points	a) Define a thermometric substance and a thermometric property. b) State the properties of a good thermometric property and a good thermometric substance. c) Give the thermometric property and substance of some thermometers. d) Define fixed points and read off the numerical values of fixed points in the Celsius scale of temperature.
	WEEK 28	**4.3 Thermometers**	• Construction and use of liquid-in-glass thermometers	a) Appreciate the need for calibrated thermometers to measure temperature. b) Calibrate a liquid-in-glass thermometer using fixed points. c) Calculate an unknown temperature from the length of the liquid column. d) Appreciate the characteristics of a good thermometric fluid. e) Appreciate the differences between a clinical and a normal
	WEEK 29	Revision		Revise and prepare for fifth sequence evaluation
	WEEK 30	Revision		

SIXTH SEQUENCE	WEEK 31	Revision		Write fifth sequence evaluation.
	WEEK 32	Revision		
	WEEK 33	Revision		
	WEEK 34	Revision		
	WEEK 35	Revision		
	WEEK 36	Revision		

FORM FOUR

	WEEKS	TOPICS	CONTENT	ATTAINMENT TARGETS
			1.0 HEAT	
FIRST SEQUENCE	WEEK 1	**1.1 Heat capacity and specific heat capacity**	• Heat capacity • Specific heat capacity • Experiments to measure specific heat capacity	c) Distinguish between heat capacity and specific heat capacity d) State units of each e) Appreciate use of materials with high and low heat capacities. f) Do calculations using the formula $Q = mc\Delta\theta$ g) Describe experiments to measure the specific heat capacity of a liquid and a solid.
	WEEK 2	**1.2 Latent heat and specific latent heat**	• Latent heat • Specific latent heat (qualitative treatment only)	e) Define latent heat and specific latent heat f) State the units of each. g) Distinguish between specific latent and latent heat. h) Explain why there is no temperature during change of state. i) Compare the energy content of specific latent heat and that of specific heat capacity of the same material. j) Explain why the specific latent heat of vaporization of a material is always greater than the specific latent heat of fusion of the same material.
	WEEK 3	**1.3 Heat transfer**	• Conduction • Convection	c) Define conduction and convection. d) Describe an experiment to compare the conductivity of different. e) Appreciate that some materials are good thermal conductors while others are poor thermal conductors. f) Give some uses of good thermal conductors and poor thermal conductors. g) Appreciate the bulk movement of particles of the fluid in convection. h) Identify and explain phenomena which result from convection. E.g. land and sea breezes.

	WEEK 4	**1.4 Heat transfer**	• Radiation • Thermal expansion	g) Define thermal radiation h) Appreciate the effects of surface area, surface nature and temperature on the rate of radiation. i) Identify and explain some applications of thermal radiation. E.g. thermal imaging. j) Name devices which convert radiant energy into other forms. k) Define thermal expansion. l) Identify problems associated with solid expansion and ways to solve them. m) Explain the principle of the bimetallic strip.
	2.0 WAVES			
	WEEK 5	**2.1 Nature of waves**	• Meaning and production • Associated terminology • Wave types • The wave equation	g) Describe wave motion in ropes, strings and springs. h) Show an understanding of how waves are produced. i) Display an understanding of waves as a form of energy. j) Describe the form of a wave k) Be familiar with wave pulses and continuous waves produced on springs/slinkies and in ripple tanks with their energy transfer characteristics. l) Explain the behaviour of particles in a medium where a wave passes. m) Distinguish between waves that are transverse and those that are longitudinal and give suitable examples. n) Distinguish between waves that are mechanical and those that are electromagnetic and give suitable examples. o) Interpret graphs of displacement against time for both wave pulses and sinusoidal continuous waves. p) Interpret graphs of displacement against distance for both wave pulses and sinusoidal continuous waves. q) Define speed, wavelength, frequency, period and amplitude of a wave. r) Recall and use the relationship $c = f\lambda$ for both mechanical and electromagnetic waves.

	WEEK 6	**Revision**		- Revise and write first sequence evaluation
SECOND SEQUENCE	WEEK 7	**2.2 Properties of waves**	• Reflection • Refraction • Diffraction • Interference	h) Describe wave motion in a ripple tank. i) Define the phenomena of reflection, refraction, diffraction and interference and bring out some of their effects in daily life. j) Use water waves to show reflection at a plane surface, refraction due to change in speed and diffraction produced by wide and narrow gaps. k) Appreciate the characteristics of a wave that change when a wave undergoes reflection, refraction and diffraction.
	WEEK 8	**2.3 Electromagnetic waves**	• General properties • The electromagnetic spectrum	h) State the general characteristics of electromagnetic waves. i) Be familiar with the relative positions of radiations on the electromagnetic spectrum, in terms of frequency and wavelength. j) For each region of the electromagnetic spectrum, state: – Its sources – Detector – Distinguishing properties – Uses and applications k) Be familiar with health hazards caused by high dosage of electromagnetic waves.
	WEEK 9	**2.4 Sound waves**	• Nature and production • Properties	g) Describe the longitudinal nature of sound waves and explain how sound is produced. h) Show an understanding that a medium is required in order to transmit a sound wave. i) Describe reflection, refraction, diffraction and interference in sound waves.

	WEEK 10	**2.5 Characteristics of sound**	• Loudness • Pitch • Quality • Speed of sound	c) Explain the factors which determine the loudness of a sound note. d) Draw displacement-time graph for loud and soft sound. e) Relate the pitch of a sound note to the frequency. f) State the approximate range of audible frequency. g) Draw displacement-time graphs for high-pitched and low-pitched sound notes. h) Define quality of a sound note. i) Distinguish between a fundamental note and overtones. j) Explain the origin of overtones. k) Draw displacement-time graphs for pure and impure notes. l) State the order of magnitude of the speed of sound in air, liquid and solid. m) Describe an experiment to measure the speed of sound in air. n) State and explain the factors which affect the speed of sound.
	WEEK 11	**2.6 Vibrating systems**	• Stationary waves • Vibrating strings • Resonance	d) Distinguish between overtones and harmonics. e) Know the meaning of a stationary wave and describe its production in vibrating strings and air columns. f) Be familiar with the relationship between inter-node distance and wavelength. g) State and explain the factors affecting the frequency of vibration of a stretched string. h) Construct a simple musical instrument e.g. a flute or a guitar. i) Understand and appreciate the meaning of resonance.
	WEEK 12	Revision		Revise and compose second sequence evaluation.

	3.0 MODERN PHYSICS			
THIRD SEQUENCE	WEEK 13	**3.1 The atom**	• Structure of the atom • Isotopes • Notations	d) Appreciate the Bohr model of the atom. e) Recall the relative size of an atom and its nucleus. f) Recall the relative masses and charges of the electrons and the nucleons. g) Appreciate that the nucleus is made up of protons and neutrons. h) Be familiar with the nucleon number/proton number notation of an atom/subatomic particle. E.g. ${}^{A}_{Z}X$ i) Define isotopes and identify isotopes of an element by its ${}^{A}_{Z}X$ notation. j) State and use the relation $A = Z + N$.
	WEEK 14	**3.2 Radioactivity**	• Meaning of radioactivity • Radioactive radiations • Background radiations	e) Understand that some nuclei emit particles such as alpha, beta and gamma. f) Recall the nature of alpha particles, beta particles and gamma radiations. g) Identify α, β and γ radiations from their penetration, ionizing ability and deflection in electric and magnetic fields. h) Understand the use of GM tubes to detect radioactive radiations. (Structure of GM tube will not be tested) i) Understand the use of diffusion cloud chambers to detect radioactive radiations. (The structure of the cloud chamber will not be tested) j) Appreciate the concept of background radiations.

	WEEK 15	**3.3 Radioactive decay**	• Nuclear equations • Activity • Half-life • Decay curves	e) Make calculations involving the changes in the nucleon number and proton number resulting from the emission of given radioactive particles. f) Explain why transmutation always accompanies alpha and beta decays. g) Appreciate the random nature of radioactive decay. h) Explain the meaning of half-life. i) Use decay curves to find half-life and other quantities. j) Allow for background radiation in handling count rates.
	WEEK 16	**3.3 Stability of the nucleus**	• N/Z ratio • Nuclear energy • Principles of fission and fusion	f) Appreciate the neutron/proton ratio as a guide to the stability of the nucleus. g) Explain the origin of the energy released during nuclear decays. h) Differentiate between nuclear fission and nuclear fusion. i) Interpret nuclear reactions.
	WEEK 17	**3.4 Radioactivity in practice**	• Uses of radioactivity • Dangers of exposure to ionising radiations • Safety precautions	c) Describe the uses of radioisotopes in medical imaging, medical therapy, food preservation, agriculture, carbon dating, smoke detectors, etc, and appreciate how these uses relate to their properties. d) Appreciate the general health hazards involved in the use of ionising radiations, e.g. X-rays, nuclear radiations, etc. e) Appreciate that the effect of ionising radiations on humans depends on the type of radiation, the activity of the source, and the type of tissue irradiated. f) Be aware of safety precautions concerned with the handling of radioactive materials, including half-life of radioactive materials.
	WEEK 18	Revision		- Revise and compose for third sequence evaluation

	4.0 ELECTRICITY			
FOURTH SEQUENCE	WEEK 19	**4.1 Electric charge**	• Types of electric charge • Electrical conductors and insulators • Force between charged materials • Electrostatic induction	e) Recall that two types of charge (positive and negative) exist. f) Define the coulomb. g) Understand that some materials allow electric charge to pass through them easily while others do not. h) Explain the charging of objects in terms of the properties of negatively charged electrons which move and bound positively charged particles i) Appreciate that tow charged particles which repel each other are similarly charged but that a charged object attracts objects which carry zero net charge as well as those which carry an opposite charge. j) Understand that the force between charged particles is stronger when the charged objects are close and when the quantity of charge on them is large. (Qualitative treatment of Coulomb's law) k) Describe how equal and opposite charges can be induced on a conducting body. l) Understand what eathing or grounding means.
	WEEK 20	**4.2 Methods of charging a material**	• By friction • By electrostatic induction • By contact	a) Understand that electric charges are separated when certain materials are rubbed against one another. b) Explain that polythene becomes negatively charged when rubbed with cloth. c) Recall that Perspex/cellulose acetate becomes positively charged when rubbed with cloth. d) With the aid of diagrams, write out the steps of charging by induction (positively or negatively) of an isolated conductor or a pair of conductors. e) Explain how to charge a conductor by contact. f) Explain everyday observations of static electricity, e.g. dust on television screens, static charges on dry cloths. g) Explain industrial hazards due to static electricity, such as fuelling aircrafts; in flour mills, electric sparks and prevention of such hazards. h) Understand the role charge plays in lightning and their prevention.

	WEEK 21	**4.3 The leaf electroscope**	• Structure • Uses	d) Describe the structure of the leaf electroscope. e) Describe experimentally how to distinguish between positively charged, negatively charged and uncharged bodies. f) Appreciate the uses of a charged leaf electroscope in identification of the types of charge, presence of charged objects and distribution of charge and potential on a conductor. (Method of charging an electroscope not required) g) Compare the relative conductive or insulative properties of a wide range of material.
	WEEK 22	**4.4 Electric current**	• Electric potential and potential difference • Electric current • Conduction in metals	d) Define electric potential and potential difference and state the units. e) Understand how potential difference leads to electron flow. f) Define electric current. g) Recall that a current in a metal wire consists of the flow of electrons in one direction and this happens when a potential difference is applied across its ends. h) Associate a current of 1 A with a flow of charge of 1 coulomb per second. i) Recall and use the relationship $Q = It$ in simple calculations. j) Understand that the volt is a joule per coulomb. k) Know the measuring instruments of electric current and potential difference and how they are connected in a circuit.

	WEEK 23	**4.5 Electrical resistance**	• Meaning of electrical resistance • Ohm's law • Factors affecting resistance • E.m.f.	d) Define resistance and state its S.I. units. e) State and use Ohm's law in simple calculations. f) Translate data about the properties of circuit components to graph and vice versa. g) Distinguish between an ohmic and a non-ohmic conductor. h) Appreciate the effects of length and cross-sectional area on the resistance of a given conductor. i) Understand that resistance may vary with temperature. j) Understand what electromotive force (e.m.f.) is. k) Recall sources of e.m.f. like mains, simple cells, dry batteries, lead-acid accumulators, car batteries, thermocouples, etc. l) Understand what terminal potential difference is. m) Distinguish between the transfer of chemical or mechanical energy per unit charge to electrical energy in cells and generators (their e.m.f.) and the transfer of electrical energy per unit charge to internal energy or other forms of energy (potential difference).
	WEEK 24	Revision		- Revise and compose for fourth sequence evaluation

FIFTH SEQUENCE	WEEK 25	**4.6 Resistors in circuit**	• Resistors in series • Resistors in parallel • Ammeters and voltmeters in circuit.	c) Be familiar with series and parallel arrangement of resistors. d) Calculate combined or effective resistance of two or more resistors in series. e) Calculate combined or effective resistance of two resistors in parallel. f) Calculate the combined resistance of three or four resistors placed in series and parallel in a single circuit. g) Use values of current, potential difference and resistance in simple calculations. h) State and explain how ammeters and voltmeters are connected in a circuit.
	WEEK 26	**4.7 Electrical energy**	• Calculation of electrical energy and power • Cost of electrical energy	g) State and use the relationship $W = QV$ in energy transfer calculations involving individual devices in a closed circuit. h) Recall and use the relationship $P = IV$ in energy transfer calculations involving individual devices in a closed circuit. i) Appreciate the heating effect of an electric current. j) Calculate energy consumption in simple cases, including energies quoted in kilowatt-hours at home. k) Calculate simple cost of electrical consumption at home.

	WEEK 27	**4.8 Mains electricity**	• Circuit components in electrical house wiring • Linear circuit and ring circuit • High tension transmission	e) Identify the main components in home circuits (the live wire, the neutral wire, the earth wire, the fuse, etc) and how they are connected. f) Appreciate the need for good electrical contact in house wiring circuits. g) Appreciate the need for good earthing in house wiring circuits. h) Select fuses of appropriate values for various electrical appliances. i) Compare linear and ring circuits in house wiring (diagrams of circuits not required) j) Appreciate the need for safety precautions in electrical installations k) Explain the advantage of transmitting electrical energy at high voltage.
	WEEK 28	**4.9 A.c. and d.c., semiconductors**	• Construction and use of liquid-in-glass thermometers	f) Understand the effects of a.c. and d.c. in wires, filament lamps and non-inductive coils. g) Distinguish between a conductor, a semiconductor and an insulator in terms of charge flow. h) Distinguish between a pure (intrinsic) semiconductor and an impure (extrinsic) semiconductor. i) Distinguish an n-type from a p-type semiconductor. j) State the function of rectification using diodes e.g. in radio sets.
	WEEK 29	Revision		Revise and prepare for fifth sequence evaluation
	WEEK 30	Revision		Write fifth sequence evaluation.

SIXTH SEQUENCE	WEEK 31	Revision		
	WEEK 32	Revision		
	WEEK 33	Revision		
	WEEK 34	Revision		
	WEEK 35	Revision		
	WEEK 36	Revision		

FORM FIVE

	WEEKS	TOPICS	CONTENT	ATTAINMENT TARGETS
1.0 MAGNETISM				
FIRST SEQUENCE	WEEK 1	**1.1 Magnets**	• Types of magnets • Magnetic properties of a dipole magnet • Magnetic Induction	h) Define a magnet and name examples of common magnets. i) Appreciate that magnetic poles exist in pairs. j) State the basic law of magnetism k) Distinguish between magnetic and non-magnetic materials, with examples. l) State differences between magnetic properties of iron and steel. m) Describe experiments to identify the poles of a magnetic dipole n) Appreciate that repulsion is the only true test for polarity. o) List the uses of magnets. p) Define magnetic induction and illustrate using diagrams.
	WEEK 2	**1.2 Magnetic fields**	• Magnetic field lines • Magnetic flux pattern • Earth's magnetism	k) Understand the terms: magnetic field lines and magnetic flux pattern. l) List the properties of magnetic field lines. m) Draw magnetic flux pattern of a bar magnet, two magnetic poles placed side by side and a horse-shoe magnet and relate the spacing of the field lines to the strength of the field. n) Know how to use permanent magnets to produce desired magnetic flux pattern over a small region. o) Describe the magnetic field of the earth and understand how it is used in navigation (i.e. using magnetic compasses).
	WEEK 3	**1.3 Magnetic field of a current-carrying conductor**	• Magnetic field pattern for current-carrying conductors • Direction of the field lines • electromagnets	i) Identify and appreciate the magnetic effect of electric current in a conductor. j) Sketch and understand magnetic flux patterns for a straight wire, a flat circular coil and a solenoid, each carrying a current and describe how to determine the direction of the field. k) State and explain the factors affecting the strength of the

				magnetic field around a current-carrying conductor. l) Describe the construction of electromagnets. m) List the advantages of electromagnets over permanent magnet. n) State the uses of electromagnets.
	WEEK 4	**1.4 Motor effect**	• Force on a current-carrying conductor in a magnetic field • Force on a charged particle moving through a magnetic field • Applications of the motor effect	n) Appreciate that a current-carrying conductor in a magnetic field experiences a force when it is not parallel to the field. o) Appreciate that a charged particle moving through a magnetic field will also experience a force when its motion is not parallel to the field. p) State the factors affecting the magnitude of the force on a current-carrying conductor in a magnetic field. q) Determine the direction of the force using Fleming's left-hand rule r) Draw magnetic flux pattern of a straight current-carrying conductor lying perpendicular to a uniform field and use it to explain the motor effect. s) State some applications of the motor effect.
	WEEK 5	**1.5 Electromagnetic induction**	• Electromagnetic induction • Faraday's law • Lenz's law	s) Define electromagnetic induction. t) Understand that a changing magnetic flux through a circuit causes an e.m.f. to be induced in the circuit and that if the circuit is closed, an induced current flows. u) State and explain the factors that affect induced current in a conductor placed in a changing magnetic field. v) Describe experiments to demonstrate that induced current increases when the rate of change of magnetic field lines increases. w) Appreciate electromagnetic induction as an energy transfer process. x) State Faraday's law and Lenz's law. y) Explain how Lenz's law is a statement of the law of conservation of energy. z) Determine the direction of induced current. aa) State some applications of electromagnetic induction

	WEEK 6	**Revision**		- Revise and write first sequence evaluation
SECOND SEQUENCE	WEEK 7	**1.6 Mutual induction**	• Meaning and definition of mutual induction. • Transformer • Self induction	l) Define and explain mutual induction m) Be familiar with the structure and functioning of the transformer. n) Relate the turn ratio of an ideal transformer to the ratio of the input and output voltages. o) Distinguish between a step-up transformer and a step-down transformer and name situations in which each is used p) Define the efficiency of a transformer and appreciate the factors which affect the efficiency of a transformer. q) Define self induction.
	WEEK 8	**1.7 Alternating current**	• Differences between a.c. and d.c. • Current/voltage -time graphs for a.c. and d.c. • Rectification	l) Distinguish between a.c. and d.c. m) Sketch current-time and voltage-time graphs for a.c. and d.c. n) Determine value for peak values and frequency of a.c. o) Describe the function of rectification using diodes e.g. in radio sets
	2.0 FORCES			
	WEEK 9	**2.1 Introduction to forces**	• Vectors and scalars • Classification of forces. • Weight	j) Distinguish between vector scalar quantities, naming examples of each. k) Understand the representation of vectors. l) Do appropriate calculations (addition, subtraction and resolution of vectors in a plane only. m) Define a force and state SI units. n) Distinguish between contact and non-contact forces and give examples of each. o) Define and calculate weight using the formula $W = mg$ and understand that it acts from the centre of gravity of an object. p) Distinguish between mass and weight. q) Explain reasons why weight varies from place to place.

	WEEK 10	**2.2 Contact forces**	• Friction • Upthrust • Drag force • Normal reaction • Tension	o) Define each of these forces and know the importance in everyday life. p) State and explain the factors affecting drag force q) Define and explain terminal velocity. r) Draw free-body diagrams.
	WEEK 11	**2.3 Moments**	• Moment of a force • Couple • Principle of moments • Conditions for equilibrium	j) Define the moment of a force and state its SI unit k) Calculate the moment of a force about a point. l) Define a couple and Name and describe everyday situations where torques and couples are used, e.g. opening a tap, handle bars on bicycles, moving coil galvanometers, simple motors. m) State the principle of moments. n) Describe simple experiments with a number of weights. o) State conditions for static and dynamic equilibrium. p) Do appropriate calculations involving co-planar parallel forces only. q) Describe an experiment to investigate the laws of equilibrium for a set of co-planar forces r) List and explain practical applications of the principle of moments.
	WEEK 12	Revision		Revise and compose second sequence evaluation.

THIRD SEQUENCE	WEEK 13	**2.4 Speed, velocity, acceleration**	• Introduction to motion • Distance and displacement • Speed and velocity • Acceleration • Equations of uniformly accelerated motion	k) State units of mass, length and time. l) Define distance and displacement, giving their SI units. m) Define and calculate speed, velocity and acceleration, stating the SI units of each. n) Distinguish between uniform and non-uniform motion. o) Apply knowledge of concepts in everyday situations like sports and moving objects. p) State and use the equations of uniformly accelerated motion in solving problems.
	WEEK 14	**2.5 Motion graphs**	• Displacement/distance vs time graphs • Velocity/speed vs time graphs	k) Draw displacement/distance–time graph, velocity/speed – time graph from tabulated data or word description. l) Describe the motion of a body from the shape of its motion graph. m) Obtain displacement-time graph from velocity-time graph and vice versa. n) Relate the velocity of a body to the slope of its displacement-time graph o) Obtain total displacement travelled from the area under a velocity-time graph. p) Relate the acceleration of a body to the slope of its velocity-time graph.
	WEEK 15	**2.6 Measurement of motion**	• Experiments to determine speed and acceleration	k) Describe experiments to determine displacement covered in a fixed time and the time taken to cover a fixed displacement. l) Interpret results from experiments with a ticker-tape timer and multi flash photographs and use such results to calculate speed and acceleration.
	WEEK 16	**2.7 Motion under gravity**	• Treatment of freefall as uniformly accelerated motion • Measurement of g.	j) Define free fall. k) Use equations of motion to simple calculations on motion under gravity. l) Describe experiments to measure the acceleration of free fall, g. m) Use the results from the above experiments to obtain a value for g.

	WEEK 17	Revision		Do exercises on motion
	WEEK 18	Revision		- Revise and compose for third sequence evaluation
FOURTH SEQUENCE	WEEK 19	**2.8 Linear momentum**	• Definition, calculation and units • Law of conservation of linear momentum	m) Define linear momentum and state its SI units. n) Do simple calculations using p = mv. o) State the principle of conservation of linear momentum. p) Describe experiments to demonstrate principle of conservation of linear momentum. q) Interpret results from such experiments r) Describe real-life situations where the principle applies, e.g. collisions, explosions, acceleration of space crafts, water jets, etc. s) Do appropriate calculations involving the law of conservation of linear momentum (problems involving change of mass need not be considered).
	WEEK 20	**2.9 Newton's laws of motion**	• First law • Second law • Third law	a) State Newton's laws of motion. b) Describe a demonstration of each law. c) Apply the knowledge of each law to explain real life situations, e.g. in seat belts, rocket travel, sports, air-bags, etc. d) State the conditions that must hold for a body to stay at rest or be in uniform motion in a straight line. e) Do calculations involving Newton's second law: $F = ma$, $F = \frac{m\Delta v}{t}$ f) Describe an experiment to show that $a \alpha F$ g) Describe examples of occurrences where balanced forces are in operation. E.g. terminal velocity. h) Understand that unbalanced forces cause an object to accelerate according to Newton's second law. i) Describe examples of occurrences in which unbalanced forces are in operation. j) Define the newton.

	WEEK 21	Revision		Do exercises on momentum and Newton's laws
	WEEK 22	Revision		
	WEEK 23	Revision		
	WEEK 24	Revision		
FIFTH	WEEK 25	Revision		
	WEEK 26	Revision		
	WEEK 27	Revision		
	WEEK 28	Revision		
	WEEK 29	Revision		
	WEEK 30	Revision		
SIXTH SEQUENCE	WEEK 31	Revision		
	WEEK 32	Revision		
	WEEK 33	Revision		
	WEEK 34	Revision		
	WEEK 35	Revision		
	WEEK 36	Revision		