

	LEVEL			
	A	B1	B2	B3
1.2 Algebra				
(a) Evaluating simple algebraic expressions, addition, subtraction, multiplication and division, use of brackets, simple algebraic fractions;	1	2	2	2
(b) Linear equations and their solutions; Indices and powers, negative and fractional indices; Binary and other applicable numbering systems; Simultaneous equations and second degree equations with one unknown; Logarithms.	—	1	1	1
1.3 Geometry				
(a) Simple geometrical constructions;	—	1	1	1
(b) Graphical representation; nature and uses of graphs, graphs of equations/functions;	2	2	2	2
(c) Simple trigonometry; trigonometrical relationships, use of tables and rectangular and polar coordinates.	—	2	2	2

MODULE 2. PHYSICS

	LEVEL			
	A	B1	B2	B3
2.1 Matter	1	1	1	1
Nature of matter: the chemical elements, structure of atoms, molecules; Chemical compounds; States: solid, liquid and gaseous; Changes between states.				
2.2 Mechanics				
2.2.1 Statics	1	2	1	1
Forces, moments and couples, representation as vectors; Centre of gravity; Elements of theory of stress, strain and elasticity: tension, compression, shear and torsion; Nature and properties of solid, fluid and gas; Pressure and buoyancy in liquids (barometers).				
2.2.2 Kinetics	1	2	1	1
Linear movement: uniform motion in a straight line, motion under constant acceleration (motion under gravity); Rotational movement: uniform circular motion (centrifugal/centripetal forces); Periodic motion: pendular movement;				

	LEVEL			
	A	B1	B2	B3
Simple theory of vibration, harmonics and resonance;				
Velocity ratio, mechanical advantage and efficiency.				
2.2.3 Dynamics				
(a) Mass; Force, inertia, work, power, energy (potential, kinetic and total energy), heat, efficiency;	1	2	1	1
(b) Momentum, conservation of momentum; Impulse; Gyroscopic principles; Friction: nature and effects, coefficient of friction (rolling resistance).	1	2	2	1
2.2.4 Fluid dynamics				
(a) Specific gravity and density;	2	2	2	2
(b) Viscosity, fluid resistance, effects of streamlining; Effects of compressibility on fluids; Static, dynamic and total pressure: Bernoulli's Theorem, venturi.	1	2	1	1
2.3 Thermodynamics				
(a) Temperature: thermometers and temperature scales: Celsius, Fahrenheit and Kelvin; Heat definition;	2	2	2	2
(b) Heat capacity, specific heat; Heat transfer: convection, radiation and conduction; Volumetric expansion; First and second law of thermodynamics; Gases: ideal gases laws; specific heat at constant volume and constant pressure, work done by expanding gas; Isothermal, adiabatic expansion and compression, engine cycles, constant volume and constant pressure, refrigerators and heat pumps; Latent heats of fusion and evaporation, thermal energy, heat of combustion.	—	2	2	1
2.4 Optics (Light)	—	2	2	—
Nature of light; speed of light;				
Laws of reflection and refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses;				
Fibre optics.				

	LEVEL			
	A	B1	B2	B3
2.5 Wave Motion and Sound	—	2	2	—
Wave motion: mechanical waves, sinusoidal wave motion, interference phenomena, standing waves;				
Sound: speed of sound, production of sound, intensity, pitch and quality, Doppler effect.				

MODULE 3. ELECTRICAL FUNDAMENTALS

	LEVEL			
	A	B1	B2	B3
3.1 Electron Theory	1	1	1	1
Structure and distribution of electrical charges within: atoms, molecules, ions, compounds;				
Molecular structure of conductors, semiconductors and insulators.				
3.2 Static Electricity and Conduction	1	2	2	1
Static electricity and distribution of electrostatic charges;				
Electrostatic laws of attraction and repulsion;				
Units of charge, Coulomb's Law;				
Conduction of electricity in solids, liquids, gases and a vacuum.				
3.3 Electrical Terminology	1	2	2	1
The following terms, their units and factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow.				
3.4 Generation of Electricity	1	1	1	1
Production of electricity by the following methods: light, heat, friction, pressure, chemical action, magnetism and motion.				
3.5 DC Sources of Electricity	1	2	2	2
Construction and basic chemical action of: primary cells, secondary cells, lead acid cells, nickel cadmium cells, other alkaline cells;				
Cells connected in series and parallel;				
Internal resistance and its effect on a battery;				
Construction, materials and operation of thermocouples;				
Operation of photo-cells.				
3.6 DC Circuits	—	2	2	1
Ohms Law, Kirchoff's Voltage and Current Laws;				