

## Module 2

### Physics

	Level			
	A	B1	B2	B3
<b>2.1 Matter</b>	1	1	1	1
Nature of matter: the chemical elements, structure of atoms, molecules; Chemical compounds; States: solid, liquid and gaseous; Changes between states.				
<b>2.2 Mechanics</b>				
<b>2.2.1 Statics</b>	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).				
<b>2.2.2 Kinetics</b>	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; Simple theory of vibration, harmonics and resonance; Velocity ratio, mechanical advantage and efficiency.				
<b>2.2.3 Dynamics</b>				
(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

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#### 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)

Nature of light; speed of light;  
Laws of reflection and refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses;  
Fibre optics.

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#### 2.5 Wave Motion and Sound

Wave motion: mechanical waves, sinusoidal wave motion, interference phenomena, standing waves;  
Sound: speed of sound, production of sound, intensity, pitch and quality, Doppler effect.

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