

Definitions

General Physics

Measurements

Scalar quantities are physical quantities that have **magnitude only**.

Vector quantities are physical quantities that have **both magnitude and direction**.

Kinematics

Speed is the **rate of change of distance**.

Average Speed is **total distance moved divided by total time taken**.

Velocity is the **rate of change of displacement**.

Uniform velocity is **constant rate of change of displacement**.

Uniform acceleration is a **constant rate of change of velocity**.

Dynamics

No definition required by syllabus.

Mass, Weight & Density

Mass is a measure of the **amount of substance** in a body.

Inertia is **the resistance of a body to a change in its state of rest or of constant motion, due to its mass**.

A **gravitational field** is a **region** in which a mass experiences a force due to **gravitational attraction**.

Gravitational field strength, g , is the **gravitational force acting per unit mass**.

Turning Effect of Forces

The **moment** of a force is the **product of the force and the perpendicular distance from the pivot to the line of action of the force**.

When a body is **in equilibrium**, the **sum of clockwise moments about a pivot is equal to the sum of anticlockwise moments about the same pivot**.

Energy, Work & Power

The **Principle of Conservation of Energy** states that **energy cannot be created or destroyed**. It can be **converted from one form to another**, but **the total energy in an isolated system is constant**.

Work done by a force is **the product of the force and the distance moved by the body in the direction of the force**.

Power is the **rate of work done or rate of energy conversion**.

Pressure

Pressure is the **force acting per unit area**.

Thermal Physics

Kinetic Model of Matter

No definition required by syllabus.

Transfer of Thermal Energy

No definition required by syllabus.

Thermal Properties of Matter

Internal energy is the total energy contained within a body. It consists of **both the kinetic energy and potential energy of the molecules**.

Melting is the **change of state from solid to liquid state, without a change in temperature, as heat is gained.**

Solidification is the **change of state from liquid to solid state, without a change in temperature, as heat is lost.**

Boiling is the **change of state from liquid to gas state, without a change in temperature, as heat is gained.**

Condensation is the **change of state from gas to liquid state, without a change in temperature, as heat is lost.**

Waves

Light

Angle of incidence is the **angle between the incident ray and the normal of the surface.**

Refractive index of a medium is the **ratio of the speed of light in vacuum to the speed of light in the medium.**

Critical angle is the **angle of incidence in an optically denser medium for which the angle of refraction in the optically less dense medium is 90° .**

When a light ray travels from an optically denser medium towards an optically less dense medium and strikes the boundary at an angle greater than the critical angle, the **entire light ray gets reflected back** into the optically denser medium. This is known as **total internal reflection**.

The **focal length** is the **distance between the optical centre and the focal point.**

Wave Properties

A **wave motion** is a travelling disturbance that **transfers energy** from one point to another. The particles of the medium **oscillate** but there is **no net transfer of the medium**.

A **transverse wave** is a wave that the **oscillation of the particles** of the medium is **perpendicular to the direction of travel of the wave.**

A **longitudinal wave** is a wave that the **oscillation of the particles** of the medium is **parallel to the direction of travel of the wave.**

A **wavefront** is an **imaginary line** on a wave that **joins all adjacent points that are in phase.**

Wavelength is the **distance between two consecutive points of a wave that are in-phase.**

Amplitude is the **maximum displacement** of a point **from its equilibrium position.**

Any of the below definitions for **period** can be used:

Period is the **time taken for a complete wave to pass a point.**

Period is the **time taken for one point on a wave to complete one oscillation.**

Any of the below definitions for **frequency** can be used:

Frequency is the **number of waves that pass a point in one second.**

Frequency is the **number of oscillations that a point on a wave makes in one second.**

Wave speed is the **distance moved by a wave in one second.**

Electromagnetic Spectrum

No definition required by syllabus.

Sound

Compression is a region where **particles are closer together** and where **pressure is higher** than the surrounding.

Rarefaction is a region where **particles are further apart** and where **pressure is lower** than the surrounding.

Echo is a **reflection of sound.**

Electricity and Magnetism

Static Electricity

An **electric field** is a **region in which an electric charge experiences a force.**

Current Electricity

An **electric current** is the **rate of flow of electric charge.**

Electromotive force (e.m.f.) is the **work done by a source in driving a unit charge around a complete circuit.**

The **potential difference** (p.d.) across a component in a circuit is the **work done to drive a unit charge through the component.**

Resistance is the **ratio of the potential difference across a component to the current flowing through it.**

D.C. Circuits

No definition required by syllabus.

Practical Electricity

Power rating of 100 W means the **rate of energy conversion is 100 joules per second.**

Live wire is the wire with **high voltage**. It is through this wire that **voltage arrives at the circuit.**

Neutral wire is the wire with **zero voltage**. It **completes the circuit with the live wire so that current can flow.**

Earth wire is the wire that is **connected to ground**. It has zero voltage.

Double insulation means **two layers of insulation**. A device that is **double-insulated does not require a connection to earth.**