Definitions and Concepts for Edexcel (IAL) Physics A-level

Unit 6: Practical Skills in Physics II

Accuracy: A measure of how close a measurement is to the true value.

Absolute Uncertainty: Uncertainty given as a fixed quantity e.g. 7 ±0.6 V.

Calibration: Comparing the reading of one instrument with another of known accuracy. Making sure that a scale reads zero before measurements are made is also an example of calibration.

Control Variable: Any factor that is held constant (or controlled) in a scientific experiment.

Dependent Variable: The variable that is being measured or tested in an experiment.

Fair Test: One in which only the independent variable has been allowed to affect the dependent variable.

Gradient: The change in the y-axis value over the change in the x-axis value between two points. If the graph is curved, a tangent can be drawn to calculate the gradient at a specific point.

Independent Variable: The variable that is altered in a scientific experiment in order to affect the dependent variable.

Micrometer Screw Gauge: A tool used for very accurate measurements of distance. They have a resolution of 0.01mm, and a range of 25mm.

Percentage Uncertainty: Uncertainty as a percentage of the measurement e.g. 7 ±8.6% V.

Precision: A measure of how close a measurement is to the mean value. It only gives an indication of the magnitude of random errors, not how close data is to the true value.

Random Error: The unpredictable variation in a measurement. These can be reduced by taking many repeated measurements and calculating their mean.

Range of an Instrument: The range of values that a tool can measure with its specified resolution.

Resolution: The smallest change in a quantity that causes a visible change in the reading that a measuring instrument records.

Sensitivity: The smallest change of input that can be detected by an instrument.

SI Units: The standard units used in equations. They are: metres, kilograms, seconds, amps, Kelvin and moles.

Significant Figures: A measure of a measurement's resolution. All numbers except zero are counted as a significant figure. When zeros are found immediately after a decimal place, they too are counted.

Systematic Error: Causes all readings to differ from the true value by a fixed amount. Systematic error cannot be corrected by repeat readings, instead a different technique or apparatus should be used.

Uncertainty: The bounds in which the accurate value can be expected to lie e.g. for 20°C ± 2°C, the true value could be within 18-22°C.

Variable: Any factors that can change or be changed.

Vernier Calipers: A tool used for accurate measurements of distance. They have a resolution of 0.1mm, and a range of 300mm.