

Advanced Higher Physics

Introduction

Key Definitions

Word/Term	Definition
SI Units	A system of units based on the metric system, including the metre (m), kilogram (kg), second (s), ampere (A), kelvin (K), mole (mol) and candela (cd).
Prefixes	Used before units to form multiples and sub-multiples of the unit. They include peta (P), tera (T), giga (G), mega (M), kilo (k), milli (m), micro (μ), nano (n), pico (p) and femto (f).
Scientific Notation	Allows us to write down large numbers quickly, and should be used in calculations instead of writing lots of zeros.
Significant Figures	Final answers should always be stated to an appropriate number of significant figures, which means there should be no more than the least accurate value in the question. You will get away with two more or one less than the least accurate value in the question.
Uncertainty	All experimental measurements are subject to uncertainty. No measurement can be 100 % accurate.
Scale Reading Uncertainty	Tells us how accurately a scale on a measuring instrument can be read. It depends on the type of scale used—analogue or digital.
Mean	For a set of repeated measurements, it is the best estimate of the 'true' value of the quantity being measured. Measurements taken tend to form a spread around the mean value.
Random Uncertainty	The slight variations in readings that occur when measurements are repeated. The more a measurement is repeated, the smaller the random uncertainty.
Systematic Uncertainty	When all measurements are affected in the same way e.g. the readings are all too high or too low due to a faulty measuring instrument or failure to 'zero' an instrument before taking readings.
Calibration Uncertainty	The difference between a manufacturer's claim for the accuracy of an instrument when compared with an approved standard.
Absolute Uncertainty	Expressing an uncertainty in absolute form, i.e. final value \pm uncertainty. Values should normally be rounded to one significant figure.
Fractional Uncertainty	Expressing an uncertainty in fractional form. This is less useful than others.
Percentage Uncertainty	Expressing an uncertainty in percentage form. This is useful for comparing uncertainties .

Word/Term	Definition
Error Bars	Used to represent the absolute uncertainty of values on a graph. When drawing a straight line graph, the best fit line should pass through all of the error bar lines.
Accuracy	Describes how close a measurement is to the true or accepted value.
Precision	Describes how close a number of measurements are to one another.