

5.2 Summary of key quantities, symbols and units

The list below is intended as a guide to the more important quantities which might be encountered in teaching and used in question papers.

This list is for use in both AS Level and full A Level qualifications.

Quantity	Usual symbols	Usual unit
Base quantities		
mass	m	kg
length	l	m
time	t	s
electric current	I	A
thermodynamic temperature	T	K
amount of substance	n	mol

Other quantities		
acceleration	a	m s^{-2}
acceleration of free fall	g	m s^{-2}
activity of radioactive source	A	Bq
amplitude	x_0	m
angle	θ	$^\circ$, rad
angular displacement	θ	$^\circ$, rad
angular frequency	ω	rad s^{-1}
angular speed	ω	rad s^{-1}
angular velocity	ω	rad s^{-1}
area	A	m^2
atomic mass	m_a	kg, u
attenuation/absorption coefficient	μ	m^{-1}
Avogadro constant	N_A	mol^{-1}
Boltzmann constant	k	J K^{-1}
capacitance	C	F
Celsius temperature	θ	$^\circ\text{C}$
decay constant	λ	s^{-1}
density	ρ	kg m^{-3}
displacement	s, x	m
distance	d	m
efficiency	η	
electric charge	q, Q	C

Quantity	Usual symbols	Usual unit
electric field strength	E	$\text{NC}^{-1}, \text{Vm}^{-1}$
electric potential	V	V
electric potential difference	V	V
electromotive force	E	V
electron mass	m_e	kg, u
elementary charge	e	C
energy	E, U, W	J
force	F	N
frequency	f	Hz
gravitational constant	G	$\text{Nm}^2 \text{kg}^{-2}$
gravitational field strength	g	N kg^{-1}
gravitational potential	ϕ	J kg^{-1}
half-life	$t_{\frac{1}{2}}$	s
Hall voltage	V_H	V
heating	q, Q	J
intensity	I	Wm^{-2}
internal energy change	ΔU	J
kinetic energy	E_k	J
magnetic flux	Φ	Wb
magnetic flux density	B	T
mean-square speed	$\langle c^2 \rangle$	$\text{m}^2 \text{s}^{-2}$
molar gas constant	R	$\text{J mol}^{-1} \text{K}^{-1}$
molar mass	M	kg mol^{-1}
moment of force	T	Nm
momentum	p	Ns
neutron mass	m_n	kg, u
neutron number	N	
nucleon number	A	
number	N, n, m	
number density (number per unit volume)	n	m^{-3}
period	T	s
permeability of free space	μ_0	H m^{-1}
permittivity of free space	ϵ_0	F m^{-1}
phase difference	ϕ	$^\circ, \text{rad}$
Planck constant	h	J s
potential energy	E_p	J

Quantity	Usual symbols	Usual unit
power	P	W
pressure	p	Pa
proton mass	m_p	kg, u
proton number	Z	
ratio of powers		dB
relative atomic mass	A_r	
relative molecular mass	M_r	
resistance	R	Ω
resistivity	ρ	$\Omega \text{ m}$
specific acoustic impedance	Z	$\text{kg m}^{-2} \text{ s}^{-1}$
specific heat capacity	c	$\text{J kg}^{-1} \text{ K}^{-1}$
specific latent heat	L	J kg^{-1}
speed	u, v, w, c	m s^{-1}
speed of electromagnetic waves	c	m s^{-1}
spring constant	k	N m^{-1}
strain	ε	
stress	σ	Pa
torque	T	N m
velocity	u, v, w, c	m s^{-1}
volume	V, v	m^3
wavelength	λ	m
weight	W	N
work	w, W	J
work function energy	Φ	J
Young modulus	E	Pa