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Formula Sheet for Cambridge IGCSE™

Physics (0625/0972)

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1st edition, for examination until 2025

Version 1

Note from the author

*This formula list consists of all the necessary formula that you must remember for the IGCSE Physics exam. Slowly remember these every day. (CBA = Can be also)

I hope you guys can remember all the formula for IGCSE Physics, and good luck in your exams!

Chapter 1: Motion, forces, and energy

Formula	What it means	Unit (can vary)
v = d ÷ t	v = velocity s = speed t = time	**Velocity** m/s (can vary)
D = s x t	D = distance s = speed	**Distance-Speed Time**
Average speed = total distance ÷ total time	N/A	**Average speed** N/A
a = v ÷ t a = (v-u) ÷ t v = u + at	a = acceleration v = starting/initial velocity t = initial time	**Acceleration** m/s^2
g = W ÷ m *2023: Free Fall = 9.8 m/s^2	g = gravitational field strength W = weight m = mass	**Gravitational F. Strgth** N/m (Newton)
p = m ÷ V	p = density m = mass V = volume	**Density** kg/m^3
s = ut + ½ at^2 s = ½ t(v+u) v^2 = u^2 + 2as	s = displacement u = initial velocity a = acceleration t = time	**Displacement** m
F = kx CBA: (k = F ÷ x)	F = force k = spring constant x = extension	**Hooke's Law** Nm
m = fd f1d1 = f2d2	m = moments f = force d = perpendicular distance	**Moments & Principle** Nm
p = mv	p = momentum m = mass v = velocity	**Momentum** kg m/s
Impulse = f x t Equal to (mv-mu)	f = force t = time	**Impulse** Ns
F = p ÷ t	F = resultant force p = momentum t = time	**Resultant Force** N

F = ma	F = force m = mass a = acceleration	**Newton Second Law** N
K.E = ½ mv^2 K.E = GPE = Efficiency x Input	m = mass v = velocity	**Kinetic Energy** J (joules)
GPE = mgh	m = mass g = gravity (10) h = height	**Gravitational P. Energy** J
W = F x d	W = work done F = force d = distance	**Work Done** J
(useful energy output ÷ total energy input) x 100%	N/A	**Efficiency (1)** %
(useful power output ÷ total power input) x 100%	N/A	**Efficiency (2)** %
P = W ÷ t P = E ÷ t	P = power W = work done E = energy transferred t = time	**Power (In Energy)** Watts (W)
p = F ÷ A	p = pressure F = force A = area	**Pressure** N/m^2 or Pa (Pascals)
p = pgh	p = pressure p = density g = gravity h = height	**Pressure in Liquids** N/m^2 or Pa
m1u1 +m2u2 = m1v1 +m2v2	m (1) or (2) = mass obj. v (1) or (2) = initial velocity	**Elastic Collision (COM)** kg m/s
m1v1i + m2v2i = (m1 + m2) VF	m (1) or (2) = mass obj. v (1) or (2)/VF = Final vlcy	**Inelastic Collision (COM)** kg m/s

Chapter 2: Thermal Physics

Formula	What it means	Unit (can vary)
T (in K) = θ (in °C) + 273	T = temperature Θ = theta	**Temperature (Kelvin)** K
pV = constant p1v1 = p2v2	p = pressure of gas v = volume of gas	**Boyle Law** N/A
c = E ÷ m θ E = mc θ (Thermal Energy) (Can be referred as Q in terms of heat energy)	c = specific heat capacity E = change in thermal eg. m = mass (kg) θ = change in temperature	**Specific Heat Capacity** J/kg°C

Chapter 3: Waves

Formula	What it means	Unit (can vary)
v = f λ	v = Wave speed f = frequency λ = Wavelength (lambda)	**Wave Speed** m/s
T = 1 ÷ f	T = wave period f = frequency	**Wave Period (Frequency)** s
i = r	i = angle of incidence r = angle of reflection	**Law of Reflection** ° (degree)

Chapter 4: Electricity and Magnetism

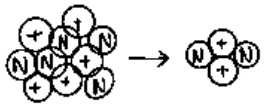
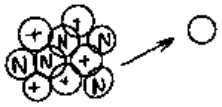
Formula	What it means	Unit (can vary)
I = Q ÷ t	I = current (A) Q = coulombs (charge) t = time (seconds)	**Current** A (Amperes)
E = W ÷ Q	E = electromotive force W = work done Q = coulombs (charge)	**Electromotive Force** V (volts)
V = W ÷ Q	V = potential difference W = work done Q = coulombs (charge)	**Potential Difference** V (volts)
R = V ÷ I	R = resistance V = voltage I = current	**Resistance** Ω (ohms)
P = I x V	P = power I = current V = voltage	**Power** W (watts)

E = IVt Also can be in E = P x t	E = energy I = current V= Voltage t = time	**Energy in Power** J (joules) (Energy is related to Power)
Series Circuit I (total) = I(1) = I(2) = I(3) V (total) = V(1) + V(2) + V(3) R (total) = R(1) + R(2) + R(3)	I = current V = voltage R = resistance	**Current, Resistance and Voltage in a Series Circuit** (A, V or Ω)
Parallel Circuit I (total) = I(1) + I(2) + I(3) V (total) = V(1) = V(2) = V(3) 1/R(total) = 1/R(1) + 1/R(2) ….	I = current V = voltage R = resistance	**Current, Resistance and Voltage in a Parallel Circuit** (A, V or Ω)
R1 ÷ R2 = V1 ÷ V2	R = resistance V = voltage	**Two Resistors in P.Divider** N/A
V(p) ÷ V(s) = N(p) ÷ N(s)	V = coil N = no. of coil Where (p and s) means Primary & Secondary.	**Step Up-Step Down Transformer**
IpVp = IsVs (P = Primary) (S = Secondary)	I = current V = voltage	**For a 100% Efficient Transformer**
P = I ^2 x R	P = power I = current R = resistance	**Electric Power** W (watts)

Chapter 5: Nuclear Physics (No Formulas are present)

Name	Symbol	Relative Mass	Relative Charge
Proton	p	1	+1e
Neutron	n	1	0
Electron	e	1/1840	−1e

Radiation	Mass	Charge	Ionising?	Penetrating ability
Alpha (α) particles	4	+2	High	Weak
Beta (β) particles	1/1840	-1	Mild	Mild
Gamma (γ) rays	0	0	Weak	High

	Alpha Emissions	Beta Emissions	Gamma Emissions
Detail	made of 2p and 2e⁻ (helium nucleus)	Beta particles = fast-moving electron ejected from the nucleus	High energy electromagnetic waves
When decay	lose 2p and 2n	a neutron in the nucleus changes to a proton and an electron	usually not emitted on own but part of α- and β- decay
Element	changes	changes	same
Diagram			
Equation:	${}^{A}_{Z}X \rightarrow {}^{A-4}_{Z-2}Y + {}^{4}_{2}\alpha$	${}^{1}_{2}X \rightarrow {}^{A}_{Z+1}Y + {}^{0}_{-1}\beta^{-}$	${}^{A}_{Z}X \rightarrow {}^{A}_{Z}X + {}^{0}_{0}\gamma$

Chapter 6: Space Physics

Formula	What it means	Unit (can vary)
$V = 2\pi r \div T$	V = velocity r = radius T = orbital period	**Orbital Speed (Average)** m/sec
$H(0) = v \div d$	H(0) = Hubble constant v = recessional velocity d = distance to galaxy	**Hubble Constant** s^-1 Estimate: 2.2 × 10^-18
$d \div v = 1 \div H(0)$	d = distance v = velocity H(0) = Hubble constant	**Age of the Universe** N/A

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Acknowledgements and Information:

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