



Frequently used physical and Constants for Competitive Exams

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Frequently used constants:

Constant	Symbol	Value
Alpha particle mass	m_a	$6.644,6565 \times 10^{-27} \text{ kg}$
Avogadro constant	N_A	$6.022,1415 \times 10^{23} \text{ mol}^{-1}$
Boltzmann constant	k	$1.380,6505 \times 10^{-23} \text{ JK}^{-1}$
Electron mass	m_e	$9.109,3826 \times 10^{-31} \text{ kg}$
Electron volt	eV	$1.602,176,53 \times 10^{-19} \text{ J}$
Electronic charge	e	$1.602,176,53 \times 10^{-19} \text{ C}$
Faraday constant	F	$96,485.3383 \text{ C mol}^{-1}$
Gravitational constant	G	$6.6742 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$
Neutron mass	m_n	$1.674,927,28 \times 10^{-27} \text{ kg}$
Permeability of free space	μ_0	$4\pi \times 10^{-7} \text{ N A}^{-2}$
Permittivity of free space	ϵ_0	$8.854,187,817 \times 10^{-12} \text{ Fm}^{-1}$
Planck constant	h	$6.626,0693 \times 10^{-34} \text{ Js}$
Proton mass	m_p	$1.672,621,71 \times 10^{-27} \text{ kg}$

Proton-electron mass ratio	$\frac{m_p}{m_e}$	1836.182,672,16
Speed of light <i>in vacuo</i>	c, c_0	$2.997,924,58 \times 10^8 \text{ m s}^{-1}$
Universal gas constant	R	$8.314,472 \text{ J K}^{-1} \text{ mol}^{-1}$

FREQUENTLY ASKED CONSTANTS

Particle physics:

Class	Name	Symbol	Mass	Mean life	Year of discovery
Leptons	Electron	e	1	Stable	1897
	Neutrino	ν	$< 10^{-3}$	Stable	1957
	Muon	μ^+, μ^-	207	$2 \times 10^{-6} \text{ s}$	1937
	Tau	τ^+, τ^-	3500	$1 \times 10^{-12} \text{ s}$	1975
Mesons	Pi meson	π^+, π^-	273	$2.6 \times 10^{-8} \text{ s}$	1947
	K meson	π^0	264	$8.4 \times 10^{-17} \text{ s}$	1947
		K^+, K^-, K^0	≈ 970	?	1947
Baryons	Proton	p	1836	$> 10^{32} \text{ y}$	1897
	Neutron	n	1839	960 s	1932
	Lambda	λ	2183	$2.6 \times 10^{-10} \text{ s}$	1947
	Sigma	$\Sigma^+, \Sigma^-, \Sigma^0$	2327	$\sim 10^{-10} \text{ s}$	1953
	Chi	Ξ^+, Ξ^-, Ξ^0	2573	$\sim 10^{-10} \text{ s}$	1954
	omega	Ω^-	3272	$\sim 10^{-10} \text{ s}$	1964

PARTICLE PHYSICS

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