Physics 2A/2B: Formulae and constants sheet TEST 3

Particles

Energy of photon	$E = hf$
Activity	$A = \frac{\Delta N}{\Delta t}$
Half-life	$A = A_0 \left(\frac{1}{2}\right)^n$
Absorbed radiation dose	$\text{absorbed dose} = \frac{E}{m}$
Dose equivalent	dose equivalent = absorbed dose x quality factor
Mass-energy relationship	$E = mc^2$

Physical constants

Speed of light in vacuum or air	c	= 3.00×10^{8} m s^{-1}
Electron charge	e	= -1.60×10^{-19} C
Electron volt	1 eV	= 1.60×10^{-19} J
Unified atomic mass unit	1 u	= 1.66×10^{-27} kg
Mass of electron	m_e	= 9.11×10^{-31} kg
Mass of proton	m_p	= 1.67×10^{-27} kg
Mass of neutron	m_n	= 1.68×10^{-27} kg
Mass of alpha	m_α	= 6.65×10^{-27} kg
Mass–energy equivalent	1 u	= 931 MeV

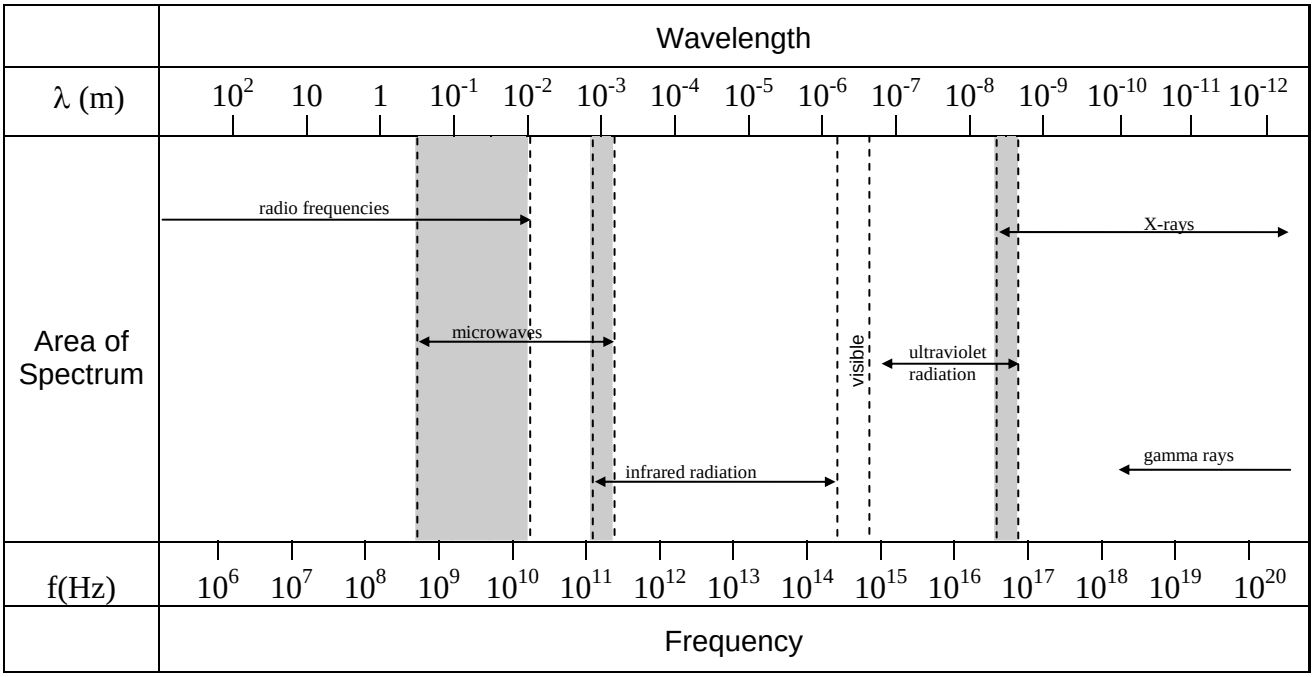
Quality factors

Approximate quality factor for alpha radiation	QF_α	=	20
Approximate quality factor for beta radiation	QF_β	=	1
Approximate quality factor for gamma radiation	QF_γ	=	1
Approximate quality factor for slow neutrons	QF_{sn}	=	3
Approximate quality factor for fast neutrons	QF_{fn}	=	10

Prefixes of the metric system

Factor	Prefix	Symbol	Factor	Prefix	Symbol
10^{12}	tera	T	10^{-3}	milli	m
10^{9}	giga	G	10^{-6}	micro	μ
10^{6}	mega	M	10^{-9}	nano	n
10^{3}	kilo	k	10^{-12}	pico	p

Electromagnetic spectrum



Note: 1. Shaded areas represent regions of overlap.
2. Gamma rays and X-rays occupy a common region.