EXAMINATION DATA SHEET FOR FURTHER STUDIES PHYSICS

Physical Constants

Name	Symbol	Value with unit
Acceleration due to Gravity	g	9,81 $m.s^{-2}$
Speed of light in a vacuum	c	$3,00 \times 10^{8}$ $m.s^{-1}$
Universal gravitational constant	G	$6,67 \times 10^{-11}$ $N.m^2.kg.^{-2}$
Coulomb's constant	k	$8,99 \times 10^{9}$ $N.m^2.C^{-2}$
Magnitude of charge on an electron	e	$1,602 \times 10^{-19}$ C
Mass of an electron	m_e	$9,109 \times 10^{-31}$ kg
Mass of a proton	m_p	$1,673 \times 10^{-27}$ kg
Mass of a neutron	m_n	$1,675 \times 10^{-27}$ kg
Unified atomic mass unit	u	$1,660 \times 10^{-27}$ kg
Avogadro's constant	N_A	$6,022 \times 10^{23}$ mol^{-1}
Absolute zero temperature	T_0	–273,15 °C
1 light-year	ly	$9,461 \times 10^{15}$ m
Stefan-Boltzmann constant	σ	$5,67 \times 10^{-8}$ $W.m^2K^{-4}$

Formulae

Thermal Physics		
$\Delta L = \alpha L_0 \Delta T$	$Q = mc\Delta T$	$Q = mL_f$
$\Delta V = \beta V_0 \Delta T$		$Q = mL_v$
Modern Physics		
$\lambda = \frac{\ln 2}{t_{\frac{1}{2}}}$	$t = -\frac{\ln(\frac{A}{A_0})}{\lambda}$	
$\lambda_{max} T = 2,9 \times 10^{-3}$ m.K	$\frac{L_{star}}{L_{sun}} = \left(\frac{m_{star}}{m_{sun}}\right)^a$	

Mechanics		
$v = u + at$ **or** $v_f = v_i + a\Delta t$	$s = \left(\frac{v+u}{2}\right)t$ **or** $\Delta x = \left(\frac{v_f + v_i}{2}\right)t$	
$v^2 = u^2 + 2as$ **or** $v_f^{\,2} = v_i^{\,2} + 2a\Delta x$	$s = ut + \frac{1}{2}at^2$ **or** $\Delta x = v_i\Delta t + \frac{1}{2}a\left(\Delta t^2\right)$	
$f = \frac{1}{T}$	$\omega = \frac{\theta}{t}$	$T = \frac{2\pi}{\omega}$
$s = \theta r$	$v = \omega r$	$a = \frac{v^2}{r}$
$g = \frac{GM}{r^2}$	$a = \omega^2 r$	$F = m\omega^2 r$
$\tau = rF\perp$	$\tau = r\perp F$	
Charged Particles in Fields		
$E = \frac{F}{q}$	$E = \frac{V}{d}$	$F = qvB\sin\theta$
Oscillations		
$a = -\omega^2 x$	$x = x_0\sin\omega t$	$x = x_0\cos\omega t$
$v = v_0\cos\omega t$	$v = v_0\sin\omega t$	$v = \pm\omega\sqrt{(x_0^{\,2} - x^2}$
$E_K = \frac{1}{2}m\omega^2\left(x_0^{\,2} - x^2\right)$		$E_P = \frac{1}{2}m\omega^2 x^2$