



SECTION 6

ASSESSMENT REFERENCE MATERIALS

Section 6: Assessment Reference Materials

CONSTANTS

Description	Value
Acceleration of gravity on Earth (g)	9.8 m/s ²
Speed of light in a vacuum (c)	3.00×10^8 m/s
Planck's constant (h)	6.63×10^{-34} J•s = 4.14×10^{-15} eV•s
Charge of electron	-1.60×10^{-19} C
Coulomb's constant (k_e)	9.0×10^9 N•m ² /C ²
Boltzmann's constant (k)	1.38×10^{-23} J/K
Gas constant (R)	8.31 J/mol•K
Gravitational constant (G)	6.67×10^{-11} N•m ² /kg ²

FORMULAS

Description	Formula
Constant acceleration	$v = v_i + at$ $x = x_i + v_i t + \frac{1}{2}at^2$ $v_f^2 - v_i^2 = 2a(x_f - x_i)$
Uniform circular motion	$a_c = \frac{v^2}{r}$
Gravitational force	$F = \frac{Gm_1m_2}{r^2}$
Friction	$F_f = \mu F_n$
Torque	$\boldsymbol{\tau} = \mathbf{r} \times \mathbf{F}$
Energy	$KE = \frac{1}{2}mv^2$ $PE = mgh$ $W = \mathbf{F} \cdot \mathbf{d}$ $P = \frac{W}{t}$
Spring	$F = -kx$ $PE = \frac{1}{2}kx^2$ $T = 2\pi\sqrt{\frac{m}{k}}$

FORMULAS (continued)

Description	Formula
Pendulum	$T = 2\pi\sqrt{\frac{L}{g}}$
Optics	$n_1 \sin \theta_1 = n_2 \sin \theta_2$ $n = \frac{c}{v}$ $\frac{1}{f} = \frac{1}{p} + \frac{1}{q}$
Fluids	$p = \rho gh$
Thermodynamics	$\Delta U = nC_v \Delta T$ $\Delta Q = mc \Delta T$ $PV = nRT$ $\frac{1}{2} m \overline{v^2} = \frac{3}{2} kT$
Electricity	$F = \frac{kq_1q_2}{r^2}$ $P = IV$ $E = \frac{F}{q}$
Magnetism	$F = qv \times B$ $F = I\ell \times B$ $\mathcal{E}_{\text{ave}} = -\frac{\Delta\phi}{\Delta t}$ $\phi = B_{\perp}A$
Photoelectric effect	$hf = \phi + eV_s$
Wave-particle relations	$E = hf$ $h = p\lambda$

NOTES FOR PHYSICS TEST

Not all formulas necessary are listed, nor are all formulas listed used on this test.

In questions on electricity and magnetism, the term *current* refers to "conventional current" and the use of the right-hand rule is assumed.

Assume the right-hand rule for solenoids.

While attention has been paid to significant figures, no answer should be considered incorrect solely because of the number of significant figures.