Semester 2 Equation Sheet

Energy: m-mass (kg), v-velocity (m/s), h-height (m), Δx-displacement (m)

Kinetic energy (the energy of an object in motion):

$E_k = (1/2)(m)(v)^2$

Gravitational potential energy (the energy an object possesses due to its position):

$E_{gp} = (m)(g)(h)$, $g = 9.81(N) / (kg)$

Elastic potential energy (the energy stored in a deformed object that can return to its original shape):

$E_{el} = (1/2)(k)(\Delta x)^2$, k- spring constant (N) / (m)

Impulse/Momentum: p- momentum ((kg(m/s)), m-mass (kg), v-velocity (m/s)

$p = (m)(v)$, $\Delta p = (m)(\Delta v)$, $\Delta p = (F_{net})(\Delta t)$

Conservation of momentum:

$$(m_1)(v_{1i}) + (m_2)(v_{2i}) = (m_1)(v_{1f}) + (m_2)(v_{2f})$$

Law of Universal Gravitation: F_g-gravitational force (N), m-mass (kg), r-distance between centers of the masses (m)

$F_g = ((G)(m_1)(m_2)) / ((r)^2)$, $G = 6.67 \times 10^{-11}\ (N*m^2) / (kg^2)$

Static Electricity: F_e-electric force (N), q-quantity of charge (C), r-distance between the charges (m)

$F_e = ((k)(q_1)(q_2)) / ((r)^2)$, $k = 8.99 \times 10^9\ (N*m^2) / (C^2)$

Current Electricity: I-current (A), V-voltage (V), R-resistance (Ω), P-power (W)

$I = (V) / (R)$, $P = (I)(V)$

Waves: v-velocity (m/s), λ-wavelength (m), *f*-frequency (Hz = cycles / s)

$v = (f)(\lambda)$