PHY 101 Fall 2006
Formula Sheet for Final Exam
Stolkin Auditorium, Thurs Dec 14, 12:30 p.m.

$KE = \frac{1}{2} m v^2.$

$GPE = mgh.$

$Elast.PE = \frac{1}{2} k x^2.$

$W = F_x * \Delta x.$

$W_{total} = \Delta KE$

$W_{external} = \Delta PE$

$P = \frac{\Delta E}{\Delta t}.$

$F_{grav} = mg$ near the Earth's surface; $F_{grav} = G \frac{m_1 m_2}{r^2}$ in general, where G = 6.67 10^{-11} m^3/kg-sec^2

$F_{spring} = kx.$

$F_{elect} = k_e \frac{q_1 q_2}{r^2}$, where k_e = 8.99 10^9 N m^2/C^2 .

$F_{elect} = qE.$

$Q = CV$

$P_{elect} = V * I.$

$V = I * R.$

$\Phi = NBA;$ $V_{induced} = \Delta\Phi/\Delta t$

$F_{mag} = B * I * L$

$Elect.PE = \frac{1}{2} C V^2.$

Electrochemical Energy stored in battery = Voltage * Capacity

$H + W = \Delta E.$

$H = C\, m\, \Delta T$

$E = m\, c^2.$

$p\, V = n\, R\, T$

$p\, V = N\, k_B\, T$

Thermal Energy in monatomic gas = $(3/2) * N * k_B * T = (3/2) * n * R * T$

Thermal Energy in diatomic gas = $(5/2) * N * k_B * T = (5/2) * n * R * T$

$W = p\Delta V$

R = 8.314 J/mole – deg; k_B = 1.381 * 10^{-23} J/deg

$T = 2\pi \sqrt{\frac{m}{k}} = 1/f$