FINAL ASSESSMENT - ACADEMIC PHYSICS

You may write on these pages. Make sure you mark your answers clearly on the answer sheet. You may use a programmable calculator. The following information may help you in solving the problems. Make sure your answer sheet includes your name, your class period and the test form.

You may need to use the following equations, as well as others you have learned.

Feel free to separate the equation sheet from the remainder of the exam.

Constants, Units and Vectors

$g = 9.8 m/s^2$	$R = \sqrt{R_X^2 + R_Y^2}, at(Tan^{-1}\frac{R_y}{R_x})$	
$G = 6.67 \times 10^{11}(Nm^2/kg^2)$	$k = 9x10^9(Nm^2/C^2)$	$c = 3 \times 10^8$

Kinematics and Projectiles

$x_f = x_i + v_i + \frac{1}{2}at^2$	$v_f^2 = v_i^2 + 2ad$	$v_f = v_i + at$

Forces and Circular Motion

$F = ma$	$T = Fd\sin\theta$	$w = mg$
$a_c = \frac{v^2}{r}$	$F_c = \frac{mv^2}{r}$	$F_f = \mu N$

Energy and Momentum

$W = Fd$	$p = mv$	$J = F \times t$
$P = \frac{W}{t}$	$F \times t = \Delta(mv)$	$Eff = \frac{Work_{out}}{Work_{in}}$
$KE = \frac{1}{2}mv^2$	$PE = mgh$	$PE = \frac{1}{2}kx^2$

Harmonics

$T = 2\pi\sqrt{\dfrac{l}{g}}$	$T = 2\pi\sqrt{\dfrac{m}{k}}$	$F = -kx$

Sound and Light

$f_o = f_s\left(\dfrac{v \pm v_o}{v \mp v_s}\right)$	$\dfrac{1}{f} = \dfrac{1}{d_i} + \dfrac{1}{d_o}$	$V = f\lambda$
$n = \dfrac{c}{v}$	$f = \dfrac{r}{2}$	$m\lambda = d\sin\theta$
$n_i\sin\theta_i = n_r\sin\theta_r$	$\theta_i = \theta_r$	$M = \dfrac{h_i}{h_o} = -\dfrac{d_i}{d_o}$

Thermodynamics and Materials

$Q = mc\Delta T$	$Q = mL$	$\Delta L = L_o\alpha\Delta T$
$H = \dfrac{kA\Delta T}{l}$	$\rho = \dfrac{m}{V}$	$P = \dfrac{F}{A}$
$P = \rho g h$	$W = \rho V g$	

Electricity and Magnetism

$F = \dfrac{kQq}{d^2}$	$W = qV = \dfrac{kQq}{d}$	$V = Ed = \dfrac{kQ}{d}$
$E = \dfrac{kQ}{d^2} = \dfrac{F}{q}$	$W_{cap} = \dfrac{1}{2}QV$	$Q = VC$
$V = IR$	$P = IV$	$EMF = \dfrac{\Delta\Phi}{t}$
$F = IlB\sin\theta$	$F = QvB\sin\theta$	$\Phi = BA\cos\theta$