

Physics II Final Exam

Formula Sheet

Chapter 1

$$1 \text{ km} = 1000 \text{ m}$$

$$\frac{\text{m}}{\text{s}} \rightarrow \frac{\text{km}}{\text{hr}} = \times 3.6$$

Chapter 2

$$v = \frac{\Delta d}{\Delta t}$$

$$\bar{v} = \frac{v_f - v_i}{a}$$

$$v_f = v_i + at$$

$$v_f^2 = v_i^2 + 2ad$$

$$d = \bar{v}t$$

$$d = v_i t + \frac{1}{2}at^2$$

$$a = \frac{\Delta v}{\Delta t}$$

Chapter 3

$$F_g = mg$$

$$F = k \Delta x$$

$$g = 9.81 \text{ m/s}^2$$

$$F_f = \mu F_n$$

$$g = 9.81 \text{ N}$$

*Chapter 4

$$F = ma$$

$$p = mv$$

$$\Delta p = F \Delta t$$

$$p = \text{kg} \cdot \text{m/s}$$

$$m_1 v_1 = m_2 v_2$$

$$F_{\text{net}} = F_a - F_f$$

$$\Delta p = \text{N} \cdot \text{s}$$

Chapter 5

$$W = F \cdot d$$

$$E_p = mgh$$

$$\Delta E = mc\Delta t$$

$$W = \Delta E$$

$$E_k = \frac{1}{2}mv^2$$

c = specific heat capacity

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

$$\text{efficiency} = \frac{W_{\text{out}}}{W_{\text{in}}} \text{ or } \frac{P_{\text{out}}}{P_{\text{in}}}$$

UNITS: $P = W$

$W = J$

$1J = 1N \cdot m$

$0^\circ K = -273^\circ C$

$1W = 1J/s$

$0^\circ C = 273^\circ K$

Chapter 6

$$T = \frac{1}{f} = \frac{\text{time}}{\text{cycles}}$$

$$f = \frac{1}{T} = \frac{\text{cycles}}{\text{time}}$$

T = period (s)

f = frequency (Hz)

$$v = \lambda f$$

$$c = 3.00 \times 10^8 \text{ m/s}$$

Chapter 7

$$\frac{1}{d_i} + \frac{1}{d_o} = \frac{1}{f}$$

$$n = \frac{c}{v} \quad c = 3.00 \times 10^8 \text{ m/s}$$

$$n_1 \sin(\theta_1) = n_2 \sin(\theta_2)$$

$$n_{\text{air}} = 1.00$$

$$\sin \theta_{ic} = \frac{1}{n}$$

Chapter 8

$$t = \frac{t_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$l = l_0 \sqrt{1 - \frac{v^2}{c^2}}$$

t_0 = moving object time

l_0 = length @ rest

t = time of observer l = moving length

$$E = mc^2$$