

**PHYSQ 124, LEC A01 : Particules et ondes****Marc de Montigny****Aide-mémoire : Examen final – lundi, 10 décembre 2007**

Nom : \_\_\_\_\_

Numéro ID: \_\_\_\_\_

**Vous pouvez ajouter des équations sur les deux côtés de cette feuille. Vous perdrez 10 points (sur 40) si vous :**

- 1. avez inclus des solutions complètes, ou**
- 2. si vous ne retournez pas l'aide-mémoire avec votre copie d'examen.**

$$\sin \theta = \frac{\text{opp}}{\text{hyp}} \quad \cos \theta = \frac{\text{adj}}{\text{hyp}} \quad \tan \theta = \frac{\text{opp}}{\text{adj}} \quad v = \frac{2\pi r}{T} \quad a_{CP} = \frac{v^2}{r} = \omega^2 r$$

$$f_K = \mu_K F_N \quad f_S \leq \mu_S F_N \quad W = Fd \cos \theta \quad E_K = \frac{1}{2}mv^2 \quad \Delta E_K = W$$

$$E = E_K + E_P \quad \Delta E = \Delta E_K + \Delta E_P = W_{NC} \quad E_{P,\text{grav}} = mgy \quad (g = 9.81 \text{ m/s}^2) \quad E_{P,\text{res}} = \frac{1}{2}kx^2$$

$$E_{K,\text{rot}} = \frac{1}{2}I\omega^2 \quad I = \sum m_i r_i^2 \quad I_{\text{poulie}} = \frac{1}{2}MR^2$$

$$\theta = s/r \quad v_T = \omega r \quad a_T = \alpha r \quad 180^\circ = \pi \text{ rad}$$

$$\vec{I} = \Delta \vec{p} = \vec{F}\Delta t \quad \vec{p} = m\vec{v} \quad x_{CM} = \frac{m_1 x_1 + \dots + m_N x_N}{m_1 + \dots + m_N}$$

$$\theta = \theta_0 + \omega_0 t + \frac{1}{2}\alpha t^2 \quad \omega = \omega_0 + \alpha t \quad \omega^2 = \omega_0^2 + 2\alpha(\theta - \theta_0)$$

$$\tau = F_\perp r = Fr_\perp \quad \sum \tau = I\alpha \quad \sum F_x = 0 \quad \sum F_y = 0 \quad \sum \tau = 0 \quad L = I\omega \quad L_i = L_f$$

$$F = -kx \quad E = \frac{1}{2}mv^2 + \frac{1}{2}kx^2 = \frac{1}{2}mv_{\text{max}}^2 = \frac{1}{2}kA^2$$

$$x = A \cos(\omega t) \quad v = -\omega A \sin(\omega t) \quad a = -\omega^2 A \cos(\omega t) \quad \omega = \sqrt{k/m} \quad \omega = \sqrt{g/L}$$

$$v = \lambda f \quad f = \frac{1}{T} \quad \omega = 2\pi f = \frac{2\pi}{T} \quad v = \sqrt{\frac{F}{\mu}} \quad \mu = \frac{m}{L} \quad I = \frac{P}{A} \quad I = \frac{P}{4\pi r^2}$$

$$f' = \frac{v \pm v_o}{v \pm v_s} f \quad \beta = 10 \log \frac{I}{I_0} \quad I = I_0 10^{\beta/10}$$

$$f_n = n f_1 \quad f_1 = \frac{v}{2L} \quad f_1 = \frac{v}{4L} \quad \tan \theta = \frac{y}{L}$$

$$\Delta d = m\lambda \quad \Delta d = \left(m + \frac{1}{2}\right)\lambda \quad d \sin \theta = m\lambda \quad d \sin \theta = \left(m + \frac{1}{2}\right)\lambda \quad W \sin \theta = m\lambda$$

$$E_n = nhf \quad h = 6.626 \times 10^{-34} \text{ J}\cdot\text{s} \quad f_0 = \frac{W_0}{h} \quad K_{\text{max}} = hf - W_0 \quad p = \frac{hf}{c} = \frac{h}{\lambda}$$

$$\Delta \lambda = \lambda' - \lambda = \frac{h}{m_e c} (1 - \cos \theta) \quad \lambda = \frac{h}{p} \quad 2d \sin \theta = m\lambda \quad \Delta x \Delta p \geq \frac{h}{2\pi} \quad \Delta E \Delta t \geq \frac{h}{2\pi}$$