**S-104.1022 Fysiikka IIb** Tentti Exam 25.5.2011

Kaavoja – Formulas

$$\lambda = \frac{\lambda_0}{n}$$

$$E = \frac{n^2h^2}{8mL}$$

$$\oint \boldsymbol{B}\cdot d\boldsymbol{\ell} = \mu_0(i_c + i_D)$$

$$d\sin\theta = m\lambda$$

$$\oint_A K\boldsymbol{E}\cdot \mathrm{d}\boldsymbol{A} = \frac{Q_{\text{encl-free}}}{\epsilon_0}$$

$$\Psi_n = \sqrt{\frac{2}{L}}\sin\frac{n\pi x}{L}$$

$$v = \frac{c}{n}$$

$$\frac{1}{C_{\text{eq}}} = \sum_i^N \frac{1}{C_i}$$

$$\Delta x \Delta p_x \geq \hbar$$

$$\frac{F}{L} = \frac{\mu_0 I I'}{2\pi r}$$

$$L = \frac{N\Phi_B}{i}$$

$$n_i \sin\theta_{\text{max}} = \sqrt{n_f^2 - n_c^2}$$

$$\text{emf} = -\frac{d\Phi_B}{dt}$$

$$\theta_r = \theta_i$$

$$I = \frac{dQ}{dt}$$

$$\phi = \frac{2\pi}{\lambda}(r_2 - r_1)$$

$$\boldsymbol{S} = \frac{1}{\mu_0}\boldsymbol{E}\times\boldsymbol{B}$$

$$\text{emf} = \int_a^b (\boldsymbol{v}\times\boldsymbol{B})\cdot d\boldsymbol{\ell}$$

$$E = cB$$

$$k = \frac{2\pi}{\lambda}$$

$$2t = \frac{\lambda_0}{n}(m-1)$$

$$E_P = 2E\left|\cos\frac{\phi}{2}\right|$$

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

$$\rho = \frac{E}{J}$$

$$\sin\theta_1 = 1.22\frac{\lambda}{D}$$

$$T = 16\frac{E}{U_0}\left(1 - \frac{E}{U_0}\right)\exp^{-2\kappa L}$$

$$\frac{1}{s_o} + \frac{1}{s_i} = \frac{1}{f}$$

$$\lambda = \frac{h}{p}$$

$$I_0\cos^2\frac{\phi}{2}\left[\frac{\sin\left(\frac{\pi a}{\lambda}\right)}{\frac{\pi a}{\lambda}}\right]^2$$

$$I = I_0\cos^2\left(\frac{\phi}{2}\right)$$

$$I = I_{\text{max}}\cos^2\phi$$

$$a\sin\theta = m\lambda$$

$$\oint_S \boldsymbol{B}\cdot d\boldsymbol{\ell} = \mu_0 I_{\text{encl}}$$

$$M = \frac{\theta_i}{\theta_o}$$

$$\frac{n_i}{s_o} + \frac{n_t}{s_i} = \frac{n_t - n_i}{R}$$

$$\oint \boldsymbol{B}\cdot d\boldsymbol{A} = 0$$

$$n_i\sin\theta_i = n_t\sin\theta_t$$

$$\rho(T) = \rho_0\left[1 + \alpha(T - T_0)\right]$$

$$c = \frac{1}{\sqrt{\epsilon_0\mu_0}}$$

$$m = \frac{y_i}{y_o} = -\frac{s_i}{s_o}$$

$$2d\sin\theta = m\lambda$$

$$y_m = R\frac{m\lambda}{d}$$

$$\frac{1}{f} = (n-1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$$

$$\tan\theta_p = \frac{n_t}{n_i}$$

$$-\frac{\hbar}{2m}\nabla^2\Psi + U\Psi = E\Psi$$

$$2t = \frac{\lambda_0}{n}\left(m - \frac{1}{2}\right)$$

$$E = hf$$

$$\Delta E\Delta t \geq \hbar$$

$$\oint \boldsymbol{E}\cdot d\boldsymbol{\ell} = -\frac{d\Phi_B}{dt}$$

$$\kappa = \frac{\sqrt{2m(U_O - E)}}{\hbar}$$

$$D = \frac{1}{f}$$