

Physics 471 Exam 3 Winter 2009 Bret Hess 422-2108
 Closed book. No time limit. Student graphing calculators OK

CID _____

$$\begin{pmatrix} 1 & d \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ 2/R & 1 \end{pmatrix} \begin{pmatrix} 1 & d/n \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ (n_i/n_t - 1)/R & n_i/n_t \end{pmatrix}$$

$$\begin{pmatrix} 1 & 0 \\ -1/f & 1 \end{pmatrix}$$

$$A + p_2 C = 1 \quad p_1 C + D = 1 \quad -1 < \frac{1}{2}(A + D) < 1$$

$$\epsilon_0 = 8.854 \times 10^{-12} \text{ C}^2/\text{N} \cdot \text{m}^2$$

$$\mu_0 = 4\pi \times 10^{-7} \text{ T} \cdot \text{m}/\text{A}$$

$$c = 2.9979 \times 10^8 \text{ m/s}$$

$$q_e = 1.602 \times 10^{-19} \text{ C}$$

$$m_e = 9.108 \times 10^{-31} \text{ kg}$$

$$k_B = 1.380 \times 10^{-23} \text{ J/K}$$

$$h = 6.626 \times 10^{-34} \text{ J} \cdot \text{s}$$

$$\hbar = h/2\pi = 1.054 \times 10^{-34} \text{ J} \cdot \text{s}$$

$$\sigma = 5.670 \times 10^{-8} \text{ W}/\text{m}^2 \cdot \text{K}^4$$