PHYS 202 Spring 2002 Formula Sheet for Exam IV

(Cutnell and Johnson Chapters 27, 29, 30)

$\sin\theta = m\lambda/d,\ m = 0, 1, 2, \ldots$ $\sin\theta = (m + \frac{1}{2})\lambda/d,\ m = 0, 1, 2, \ldots$

$\lambda_{\text{film}} = \lambda_{\text{vacuum}}/n$

$\sin\theta = m\lambda/W,\ m = 1, 2, 3, \ldots$

$\sin\theta = 1.22\lambda/D$ $\theta_{\text{min}} = 1.22\lambda/D$

$E = hf$ $h = 6.626 \times 10^{-34}$ J·s

$hf = \text{KE}_{\text{max}} + W_0$

$\lambda' - \lambda = (h/(mc))(1 - \cos\theta)$

$\lambda = h/p$

$(\Delta p_y)(\Delta y) \geq h/(2\pi)$

$(\Delta E)(\Delta t) \geq h/(2\pi)$

$1/\lambda = R(Z^2)(1/n_f^2 - 1/n_i^2)$ $R = 1.097 \times 10^7\ \text{m}^{-1}$

$L_n = mv_n r_n = nh/(2\pi)$

$r_n = (5.29 \times 10^{-11}\ \text{m})n^2/Z$ $E_n = -(13.6\ \text{eV})Z^2/n^2$

$L = \sqrt{l(l+1)}h/(2\pi)$ $L_z = m_l h/(2\pi)$