

Ch 24 : Electromagnetic Waves

$$v = f\lambda \quad n = \frac{c}{v}$$

$$f_0 \approx f_s \left(1 + \frac{v_{rel}}{c} \right) \quad v_{rel} \ll c$$

$$\bar{S} = \bar{S}_0 \cos^2 \theta$$

Ch 25 : Reflection

$$\theta_r = \theta_i \quad f = \frac{1}{2} R$$

$$\frac{1}{d_o} + \frac{1}{d_i} = \frac{1}{f} \quad m = \frac{h_i}{h_o} = \frac{-d_i}{d_o}$$

Ch 26 : Refraction

$$n = \frac{c}{v} \quad n_1 \sin \theta_1 = n_2 \sin \theta_2$$

$$d' = d \frac{n_2}{n_1}$$

$$\sin \theta_c = \frac{n_2}{n_1} \quad n_1 > n_2$$

$$\frac{1}{d_o} + \frac{1}{d_i} = \frac{1}{f} \quad m = \frac{h_i}{h_o} = \frac{-d_i}{d_o}$$

$$d_{o2} = s - d_{i1} \quad m_{tot} = m_1 \times m_2 \times \dots$$

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

Ch27 : Interference

$$\Delta l = m\lambda \quad m = 0, \pm 1, \pm 2, \dots$$

$$\Delta l = \left(m + \frac{1}{2} \right) \lambda \quad m = 0, \pm 1, \pm 2, \dots$$

$$t = \frac{m\lambda_{film}}{2} \quad m = 0, 1, 2, 3, \dots$$

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

$$\text{slits per cm} = \frac{1}{d} \quad \sin \theta = m \frac{\lambda}{d}$$

$$\sin \theta = m \frac{\lambda}{W} \quad m = 1, 2, 3, \dots$$

$$\sin \theta = 1.22 \frac{\lambda}{D} \quad \theta_{min} \approx 1.22 \frac{\lambda}{D}$$

Name: _____

Ch 29 : Particles & Waves

$$E = hf$$

$$K_{max} = hf - \phi$$

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

$$\Delta x \Delta p_x \geq \frac{\hbar}{2}$$

Ch 30 : The Atom

$$E_n = -13.6eV \frac{Z^2}{n^2}$$

$$\Delta E = hf$$

$$\frac{1}{\lambda} = R \left(\frac{1}{n_f^2} - \frac{1}{n_i^2} \right)$$

$$L = \sqrt{l(l+1)} \frac{h}{2\pi} \quad l = 0, 1, 2, \dots, n-1$$

$$L_z = m_l \frac{h}{2\pi} \quad m_l = -l, -l+1, \dots, -1, 0, +1, \dots, l-1, l$$

$$m_s = \pm \frac{1}{2}$$

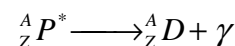
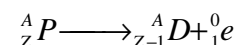
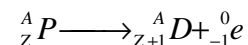
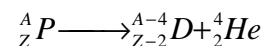
1s, 2s, 2p, 3s, 3p, 4s, 3d, 4p, 5s, 4d, 5p, 6s, 4f, 5d, 6p, 7s

Ch 31 : Nuclear Physics & Radioactivity

$$A = N + Z \quad {}^A_Z X$$

$$\Delta m = m(Z \text{ protons} + N \text{ neutrons}) - m(\text{nucleus})$$

$$B.E. = \Delta mc^2$$



$$\frac{\Delta N}{\Delta t} = -\lambda N \quad N = N_0 e^{-\lambda t} \quad T_{1/2} = \frac{0.693}{\lambda}$$

Constants

$$c = 3.00 \times 10^8 \text{ m/s} \quad m_p = 1.0072765u$$

$$1eV = 1.602 \times 10^{-19} J \quad m_n = 1.0086649u$$

$$h = 6.626 \times 10^{-34} Js \quad m_e = 0.0005486u$$

$$R = 1.097 \times 10^7 m^{-1} \quad c^2 = 931.494 MeV/u$$