DATE
TOPIC (1)

Exam #2 Chapter 3

Ch. 3

1. $y_n = \frac{n \lambda D}{d}$ location of maxima

2. Bragg Diffraction $2d \sin\theta = n\lambda$ $n = 1, 2, \ldots$

Diffraction Grating $d \sin\theta = n\lambda$ $n = 1, 2, \ldots$

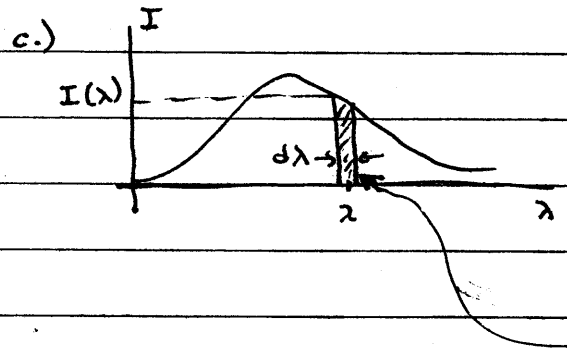
3. Photo electric Effect Page 77 (3 experimental results)

$K_{max} = hf - \phi$ $\boxed{E_\gamma = \frac{hc}{\lambda}}$ $\boxed{p_\gamma = \frac{h}{\lambda}}$ Photons only

4. Thermal Radiation a.) $I = \sigma T^4$ $\frac{\text{Watts}}{m^2}$

b.) $\lambda_{max} T = 2.8978 \times 10^{-3}\ m \cdot K$

c.)

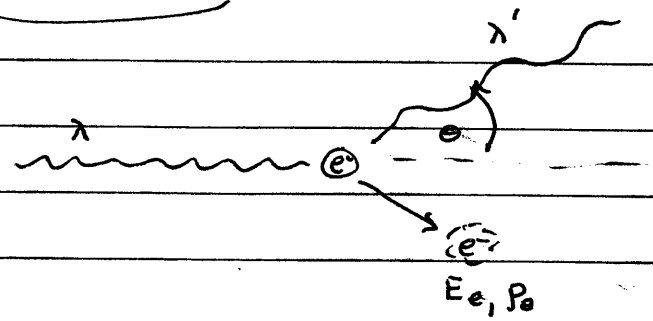


$I(\lambda) = \frac{2\pi hc^2}{\lambda^5} \frac{1}{e^{hc/\lambda kT} - 1}$

Power (in $d\lambda$) / Area $= I(\lambda)\, d\lambda$

4. Compton Scattering

$\lambda' - \lambda = \frac{h}{m_e c}(1 - \cos\theta)$



5. Bremsstrahlung $hf = \frac{hc}{\lambda_{min}} = K_{max} = eV$ or $e(\Delta V)$

$\lambda_{min} = \frac{hc}{e\,\Delta V}$

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TOPIC (2)

Exam #2 Chapter 4

1.) de Broglie's Hypothesis

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

$p = \sqrt{2mK}$ (non-relativistic)

$p^2c^2 = K^2 + 2mc^2K$ (relativistic)

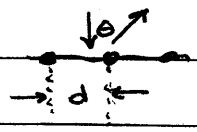
2.) Particle Diffraction

a.) Single Slit Diffraction (width = a)

Minima occur at $a\sin\theta = n\lambda$ $n = 1, 2, 3$

b.) Particles diffracting off a crystal (d = separation)

$d\sin\theta = n\lambda$



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

3.) Uncertainty Principle

$\Delta E\ \Delta t \geq \hbar$ $\Delta p_x\ \Delta x \geq \hbar$

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TOPIC	

Exam #2 Chapter 5

1.) Schrödinger Eq.

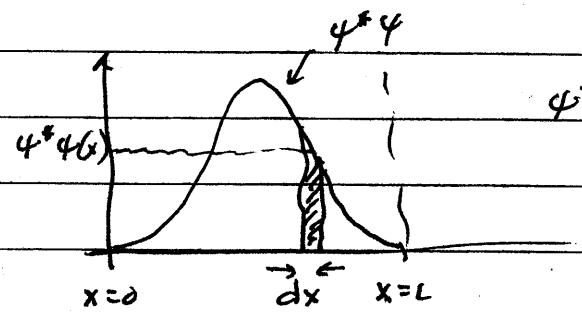
$$\psi = A\left(|1\rangle + 5|2\rangle + 2|3\rangle\right)$$

2.) Normalization $A = ?$

b.) Infinitely deep well $\langle E \rangle = ?$

probability of measuring E_3

What about SHO - Simple Harmonic Oscillator.



$\psi^*\psi\, dx = ?$ probability