Formulae and constants

Mass of electron m_e = 9.1. 10^{-31} kg

Charge on electron = $1.6.10^{-19}$ C

Planck's Constant h= 6.626. 10^{-34} J.s =4.136. 10^{-15} eV.s

$\hbar = h/2\pi = 1.055.10^{-34} J.s = 6.582.10^{-16} eV.s$

1 eV =1.6. 10^{-19} J

Coulomb's constant $k = 1/(4\pi\varepsilon_0) = 8.99.10^9 N.m^2/kg^2$

Velocity of light c = 3.10^8 m/s

Energy of photon E = hf

For photon $\lambda f = c$

Compton formula $\lambda' - \lambda = (h/m_e c)(1 - \cos\varphi)$

Bragg's Law $n\lambda = 2d\sin\theta$ (n=1,2,……)

Bohr's quantization for Angular momentum $mvr = n\hbar$

Bohr radius a_0 =0.529. 10^{-10} m

1 Rydberg (Energy required to ionize hydrogen atom) =13.6 eV

Rydberg Constant R = 1.097. 10^7 m^{-1}

Force due to Electric field : $\mathbf{F} = q\mathbf{E}$

Force due to Magnetic Field: $\mathbf{F} = q\mathbf{vxB}$

Momentum operator $p = -i\hbar\frac{\partial}{\partial x}$

Stationary Schrodinger Equation $-\frac{\hbar^2}{2m}\frac{d^2\psi}{dx^2} + U(x)\psi = E\psi$