FORMULA SHEET FOR EXAM#2
PHYSICS 212
TERM 022

$$R = 1.097 \times 10^{7}\ m^{-1}$$

$$v_g = v_p \left| k_0 + k_0 \frac{dv_p}{dk} \right| k_0$$

$$\frac{e}{m} = \frac{V\theta}{B^2 ld}$$

$$q = \left(\frac{mg}{E}\right)\left(\frac{v+v'}{v}\right)$$

$$D = 6\pi a \eta v$$

$$\rho = \frac{m}{V}$$

$$m_e v r = n\hbar$$

$$r_n = \frac{n^2 a_0}{Z}$$

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

$$\Delta n = \frac{k^2 Z^2 e^4 NnA}{4R^2 K \sin^4\left(\frac{\phi}{2}\right)}$$

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

$$v_g = \frac{dw}{dk}$$

$$v_p = \frac{w}{k}$$

$$E^2 = p^2 c^2 + m^2 c^4$$

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

$$\Delta E \cdot \Delta t \geq \frac{\hbar}{2}$$

$$\hbar = \frac{h}{2\pi}$$

$$m_e = 9.1 \times 10^{-31}\ kg$$

$$e = 1.6 \times 10^{-19}\ C$$

$$h = 6.63 \times 10^{-34}\ Js$$

$$c = 3 \times 10^{8}\ m/s$$

$k = 9 \times 10^{9}\ \frac{N \cdot m^2}{C^2}$

$g = 9.8\ m/s^2$