

Formula Sheet For PH 213 Midterm II

$$Q_e = -1.60 \times 10^{-19} \text{ C} \quad Q_p = +1.60 \times 10^{-19} \text{ C} \quad m_e = 9.11 \times 10^{-31} \text{ kg} \quad m_p = 1.67 \times 10^{-27} \text{ kg}$$

$$V_C = Q/C \quad U_C = (1/2) QV \quad I = \Delta Q/\Delta t = dQ/dt \quad V_R = IR \quad P_R = IV$$

$$V_S = V_1 + V_2 + \dots \quad V_P = V_1 = V_2 = \dots \quad I_S = I_1 = I_2 = \dots \quad I_P = I_1 + I_2 + \dots$$

$$R_S = R_1 + R_2 + \dots \quad R_P = (1/R_1 + 1/R_2 + \dots)^{-1} \quad C_S = (1/C_1 + 1/C_2 + \dots)^{-1} \quad C_P = C_1 + C_2 + \dots$$

$$V = E \pm IR_{\text{int}} \quad Q(t) = Q_0 e^{-t/RC} \quad Q(t) = Q_0 (1 - e^{-t/RC}) \quad I(t) = I_0 e^{-t/RC}$$

$$\vec{F}_m = Q(\vec{v} \times \vec{B}) \quad \vec{F}_m = I(\vec{L} \times \vec{B}) \quad R = \frac{mv}{|Q|B} \quad \vec{B} = \int \frac{\mu_0 I}{4\pi} \frac{d\vec{l} \times \hat{R}}{R^2} \quad \oint \vec{B} \cdot d\vec{l} = \mu_0 I_{\text{enclosed}}$$

$$B = \frac{\mu_0 I}{2\pi R} \quad B = \frac{\mu_0 I}{2R} \quad B = \frac{\mu_0 I}{4\pi R} (\sin \theta_1 + \sin \theta_2) \quad \mu_0 = 4\pi \times 10^{-7} \frac{T \cdot m}{A}$$

$$E_{\text{induced}} = (-) \frac{d}{dt} \int \vec{B} \cdot d\vec{A} \quad E_{\text{induced}} = NAB\omega \sin(\omega t) \quad \frac{V_P}{V_S} = \frac{I_S}{I_P} = \frac{N_P}{N_S}$$