

Physics 102
Formula Sheet for 2nd Major Exam
Summer Session 2004 –(Term 033)

$$Q = mc\Delta T, \quad Q = mL$$

$$Q = n C_p \Delta T, \quad Q = n C_v \Delta T$$

$$T_c = T - 273$$

$$\Delta S = \int \frac{dQ}{T}$$

$$W = Q_H - Q_L$$

$$\varepsilon = \frac{W}{Q_H} = 1 - \frac{Q_L}{Q_H}$$

$$\frac{Q_L}{Q_H} = \frac{T_L}{T_H}$$

$$K = \frac{Q_L}{W}$$

$$F = k \frac{q_1 q_2}{r^2}$$

$$U = -\vec{P} \cdot \vec{E}$$

$$\vec{\tau} = \vec{P} \times \vec{E}$$

$$v = v_0 + at$$

$$x - x_0 = v_0 t + \frac{1}{2} a t^2$$

$$v^2 = v_0^2 + 2 a (x - x_0)$$

$$\Phi = \int_{\text{Surface}} \vec{E} \cdot d\vec{A}$$

$$\Phi_c = \oint \vec{E} \cdot d\vec{A} = \frac{q_{in}}{\varepsilon_0}$$

$$E = \sigma / 2\varepsilon_0$$

$$E = \sigma / \varepsilon_0$$

$$E = k \frac{q}{r^2}$$

$$E = k \frac{q}{R^3} r$$

$$E = \frac{2k\lambda}{r}$$

$$\Delta V = V_B - V_A = - \int_A^B \vec{E} \cdot d\vec{S} = \frac{\Delta U}{q_0}$$

$$V = k \frac{q}{r}$$

$$E_x = -\frac{\partial V}{\partial x}, \quad E_y = -\frac{\partial V}{\partial y}, \quad E_z = -\frac{\partial V}{\partial z}$$

$$U = k \frac{q_1 q_2}{r_{12}}$$

$$C = \frac{q}{V}$$

$$C = \kappa C_{\text{air}}$$

$$U = \frac{1}{2} CV^2$$

$$I = \frac{dQ}{dt}$$

$$I = JA$$

$$R = \frac{V}{I} = \rho \frac{L}{A}$$

$$J = \sigma E$$

$$\rho = \rho_0 [1 + \alpha(T - T_0)]$$

$$P = IV$$

Constants:

$$k = 9.00 \times 10^9 \text{ N}\cdot\text{m}^2/\text{C}^2$$

$$\varepsilon_0 = 8.85 \times 10^{-12} \text{ C}^2/\text{N}\cdot\text{m}^2$$

$$e = 1.60 \times 10^{-19} \text{ C}$$

$$m_e = 9.11 \times 10^{-31} \text{ kg}$$

$$m_p = 1.67 \times 10^{-27} \text{ kg}$$

$$g = 9.8 \text{ m/s}^2$$

$$R = 8.31 \text{ J/mol}\cdot\text{K}$$

$$1 \text{ atm} = 1.013 \times 10^5 \text{ N/m}^2$$

$$\text{micro} = 10^{-6}$$

$$\text{nano} = 10^{-9}$$

$$\text{pico} = 10^{-12}$$

$$\text{lambda} = \lambda$$

$$\text{sigma} = \sigma$$

$$a*b**c = ab^c$$