

ISP 209 – Summer 2006
Equations for Exam 2

- **Energy**

$$K = \frac{1}{2} m v^2$$

$$U = mgh \quad (\text{gravity; } g = 9.81 \text{ m/s}^2)$$

$$U = \frac{1}{2} k x^2 \quad (\text{spring; } k = \text{Hooke's constant})$$

$$\text{Power} = \text{Energy} / \text{Time}$$

- **Static Electricity**

$$F = \frac{KQ_1Q_2}{r^2} \quad (\text{Coulomb's law; } K = 8.99 \times 10^9 \text{ Nm}^2/\text{C}^2)$$

$$\mathbf{E}(\mathbf{x}) = \mathbf{F} / q \quad (\text{hypothetical test charge } q)$$

$$Q = CV \quad \text{and} \quad U = \frac{1}{2} QV \quad (\text{capacitor; } C = \text{capacitance})$$

- **Electric Current**

$$I = \frac{\Delta Q}{\Delta t} \quad \text{or} \quad \Delta Q = I \Delta t$$

$$V = IR \quad (\text{Ohm's law; } R = \text{resistance})$$

$$P = IV = I^2 R \quad (\text{Joule's law})$$