1 Equations

$$\vec{F}_{q_1 q_2} = \frac{k|q_1||q_2|}{r^2}\hat{r} \tag{1}$$

$$\Phi_E = \sum \Delta A E \cos\theta = \sum \Delta A \vec{E} \cdot \hat{n} \tag{2}$$

$$\Phi_E = Q/\epsilon_0 \tag{3}$$

$$EPE = Vq \tag{4}$$

$$V = \frac{kq}{r} \tag{5}$$

$$\vec{E} = \vec{F}/q_0 \tag{6}$$

$$-W_{AB} = V_B - V_A = \frac{EPE_B}{q_0} - \frac{EPE_A}{q_0} \tag{7}$$

$$V = EPE/q_0 \tag{8}$$

$$V = IR \tag{9}$$

$$P = IV \tag{10}$$

$$P = I^2 R \tag{11}$$

$$P = \frac{V^2}{R} \tag{12}$$

$$R = \rho\frac{L}{A} \tag{13}$$

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + ... \tag{14}$$

$$R_s = R_1 + R_2 + ... \tag{15}$$

$$|\vec{F}_B| = IL|\vec{B}|\sin\theta \tag{16}$$

$$|\vec{F}_B| = q|\vec{v}||\vec{B}|\sin\theta \tag{17}$$

$$\tau = NIBA\sin\phi \tag{18}$$

$$\mathscr{E} = \frac{\Delta\Phi}{\Delta t} \tag{19}$$

$$\Phi_B = NBA\cos\phi \tag{20}$$

$$B = \frac{\mu_0 I}{2\pi r} \tag{21}$$

$$r = \frac{mv}{qB} \tag{22}$$

$$\mathscr{E} = vBL \tag{23}$$

$$\mathscr{E} = NAB\omega\sin\omega t \tag{24}$$

$$\vec{a} \times \vec{b} = \hat{x}(a_2b_3 - a_3b_2) - \hat{y}(a_1b_3 - a_3b_1) + \hat{z}(a_1b_2 - a_2b_1) \tag{25}$$

$$\bar{S} = \frac{1}{2}\bar{S}_0 \tag{26}$$

$$\bar{S} = \bar{S}_0 \cos^2\theta \tag{27}$$

$$m = \frac{h_i}{h_o} = \frac{-d_i}{d_o} \tag{28}$$

$$\frac{1}{f} = \frac{1}{d_I} + \frac{1}{d_o} \tag{29}$$

$$f = R/2 \tag{30}$$

$$v = \lambda f \tag{31}$$

$$n_1 \sin\theta_1 = n_2 \sin\theta_2 \tag{32}$$

$$E = hf \tag{33}$$

$$\sin\theta = m\frac{\lambda}{d} \tag{34}$$

$$\sin\theta = (m + \frac{1}{2})\frac{\lambda}{d} \tag{35}$$

$$t = t_0/\sqrt{1 - \frac{v^2}{c^2}} \tag{36}$$

$$L = L_0\sqrt{1 - \frac{v^2}{c^2}} \tag{37}$$

$$p = mv/\sqrt{1 - \frac{v^2}{c^2}} \tag{38}$$

$$P(x) = \frac{2}{L}\sin^2\frac{n\pi x}{L} \tag{39}$$

$$P(x) = \frac{2}{L}\sin^2\frac{n\pi x}{L} \tag{40}$$

$$\lambda = h/p \tag{41}$$

$$\Delta x \Delta p \geq h/4\pi \tag{42}$$