электростатика

$$\Sigma q = const$$

$$q = \frac{q_1 + q_2}{2} \; ; \; f_k = k\frac{|q_1||q_2|}{\varepsilon r^2}$$

$$\vec{E} = \frac{\vec{F}}{q} \; ; \; E = k\frac{|q|}{\varepsilon r^2}$$

$$\varphi = \frac{W_p}{q} \; ; \; \varphi = k\frac{q}{\varepsilon r}$$

$$A = qEd = qU$$

$$C = \frac{q}{U} \; ; \; C = \frac{\varepsilon \varepsilon_0 S}{d}$$

$$C_{\parallel} = C_1 + C_2$$

$$C_{посл} = \frac{C_1 \cdot C_2}{C_1 + C_2}$$

$$W_{эл} = \frac{CU^2}{2}$$

$$W_{эл} = \frac{q^2}{2C}$$

энер взаим. 2т-з.

$$U = k\frac{q_1 q_2}{r}$$

постоянный эл. ток

$$I = \frac{q}{t} \; ; \; I = q \upsilon n S$$

$$U = \varphi_1 - \varphi_2 \; ; \; U = \frac{A_{пол}}{q}$$

$$\varepsilon = \frac{A_{ст}}{q}$$

$$R = \rho\frac{\ell}{S}$$

$$I = \frac{U}{R}$$

$$I = \frac{\varepsilon}{R + r}$$

последовате.

$$I_0 = I_1 = I_2$$

$$U_0 = U_1 + U_2$$

$$R_0 = R_1 + R_2$$

параллельн.

$$I_0 = I_1 + I_2$$

$$U_0 = U_1 = U_2$$

$$R_0 = \frac{R_1 R_2}{R_1 + R_2}$$

$$A = Q = IUt = I^2 R t = \frac{U^2}{R}t \; ; \; N = IU = I^2 R = \frac{U^2}{R} \; ; \; N_{max} \; при \; R = r$$

магнетизм

$$F_A = IB\ell \sin\alpha$$

$$F_л = q\upsilon B \sin\alpha$$

$$\Phi = B_i S \cdot \cos\alpha$$

$$L = \frac{\Phi}{I}$$

$$R = \frac{m\upsilon}{qB}$$

$$T = \frac{2\pi m}{qB}$$

$$W_M = \frac{LI^2}{2}$$

переменный ток

$$q = q_m \cos\omega t$$

$$i = q'(t)$$

$$X_L = \omega L \; ; \; X_c = \frac{1}{\omega C}$$

$$T = 2\pi\sqrt{LC}$$

резонанс

$$X_L = X_c$$

$$\Phi = \Phi_m \cos\omega t$$

$$\varepsilon_i = -\Phi'(t)$$

$$\varepsilon_{is} = -LI'(t)$$

$$\varepsilon_{дв.} = \upsilon B \ell$$

$$U_g = \frac{U_m}{\sqrt{2}} \; ; \; I_g = \frac{I_m}{\sqrt{2}}$$

тр-р $\dfrac{N_2}{N_1} = \dfrac{U_2}{U_1} = k$

$$P_1 = P_2$$

э/м волны

$$c = \lambda \nu \; ; \; \upsilon_{в-ве} = \frac{c}{n}$$

интерф. $\Delta = k\lambda = 2k\dfrac{\lambda}{2}$ max

$$\Delta = (2k+1)\frac{\lambda}{2} \; min$$

дифр. $d\sin\varphi = k\lambda$

дисперс. $n_{ф} > n_{кр} \; ; \; \upsilon_{кр} > \upsilon_{ф}$

геом. оптика

отраж. $\alpha = \gamma$

прел. $\dfrac{\sin\alpha}{\sin\beta} = \dfrac{n_2}{n_1}$

полн. внутр. отр. $\sin\alpha_0 = \dfrac{1}{n}$

$$D = \frac{1}{F} \; ; \; \Gamma = \frac{H}{h} = \frac{|f|}{d}$$

$$\pm\frac{1}{F} = \frac{1}{d} + \frac{\pm 1}{f}$$

квантовая физика

$$E_{ф} = h\nu$$

$$E = mc^2$$

$$m_{ф} = \frac{h\nu}{c^2}$$

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

$$E_{ф} = A_в + E_{кэ}$$

$$h\nu_{кр} = A_в$$

$$E_{кэ} = \frac{m_e \upsilon^2}{2} = q_e U_3$$

$$\Delta M = (Z m_p + N m_n) - m_я$$

$$E_{св} = \Delta M c^2$$

$$N = N_0 \cdot 2^{-\frac{t}{T_{1/2}}}$$

$$\alpha = {}^{4}_{2}He$$

$$\beta = {}^{0}_{-1}e$$

$${}^{1}_{0}n \; ; \; {}^{1}_{1}H$$