Chapter 27. 28, 37, 41, 47, 62, 67.

28 $\mathcal{E} - ir = iR$

(a) $r_1 = \frac{\mathcal{E}}{500+r}$ $i_1 R_1 = V_1$ $i_1 = 0.2mA$

同理 $0.15 + 1.25 \cdot 10^{-4} r = 6$

代入 $r = 667\Omega$

(b) $\mathcal{E} = 0.233V$

(c) $P = I^2 R$ $\eta = 0.185\%$

37. (a) $20 - I_1 \cdot 1 - I_2 \cdot 2 - 4 - I_1 = 0$

$20 - I_1 - (I_1 - I_2) - 4 - (I_1 - I_2) - I_1 = 0$

$2(I_1 + I_2) = -2$ ① $I_1 + I_2 = -1$

$2I_1 - 2I_2 + 2I_1 = -2$ ② $2I_1 - I_2 = -1$

$3I_1 = -2$

$I_1 = -\frac{2}{3}A$

$I_2 = -\frac{1}{3}A$ 方向向左

$I_3 = 0.33A$ 方向向右.

$V_a - V_b = 3.34V$

battery 1 providing energy

$P_1 = \mathcal{E} \cdot I = 2 \times \frac{2}{3} = \frac{4}{3}W$

41 (a) $R = \frac{\rho l}{A}$ $I = \frac{i}{\frac{\rho_{Cu} A_{Cu}}{\rho_{Al} A_{Al}} + 1} = 0.84A$

(b) $I_{Al} = 1.16A$

(c) $R = 6\Omega$ 代入 $l = 163m$

4].

(a) $R_{总} = \frac{R_1(R_2+R_3)+R_2R_3}{R_2+R_3}$ $I_1 = \frac{U}{R_{总}} = 1.1\times10^{-3}A$

(b) $I_2 = 5.5\times10^{-4}A$ (c) $I_3 = 5.5\times10^{-4}A$

(d) $t=\infty$ 时 $I = 8.22\times10^{-4}A$

(e) $R_{总} = R_1+R_V$ $I_2 = I$

(f) $I_3 = 0$. (g) $V_2 = I_2R_2 = 4\,01.5V$ (h). $6\,00.06V$

6]. (a) $E = \frac{Q^2}{2C}$ 或 $Q = \sqrt{2CE} = 1.09\times10^{-3}C$.

(b) $i = \frac{dq}{dt} = -\frac{Q}{RC}e^{\frac{t}{RC}}$

$I(t=0) = -1.09\times10^{-3}A$

(c) $V_C = V_0\cdot e^{-\frac{t}{RC}} = 10.0Ve^{-t}$

(d) $V_R = 10.0Ve^{-t}$ (e) $P_R = 1.09We^{-2t}$

6]. (a) $\mathcal{E}_2 + I_2R_1 = 0$ $I = 0.1A$ (b) $\mathcal{E}_1 - I_2R_2 = 0$ $I_2 = 0.16A$

(c) $V_{ab} = 14V$