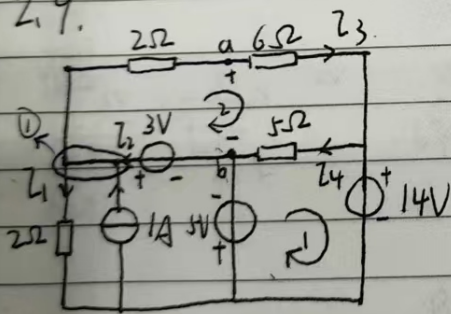


$$\begin{aligned}
 2.4: \quad (3): I_2 - 1 - 3 &= 0 & I_2 &= 4A \\
 (2): I_2 + I_1 - 1 &= 0 & I_1 &= -3A \\
 (1): I_1 - 2 - I_7 &= 0 & I_7 &= -5A \\
 (4): 1 + 2 + I_5 &= 0 & I_5 &= -3A \\
 (5): 3 + I_6 - I_5 &= 0 & I_6 &= -6A
 \end{aligned}$$

$$\begin{aligned}
 2.5: \text{在 } (1)(4)(5) \text{ 回路: } -U_5 + 3 + 8 &= 0 & U_5 &= 11V \\
 \text{在 } (2)(4)(5) \text{ 回路: } -U_5 - U_2 - 8 &= 0 & U_2 &= -19V \\
 \text{在 } (1)(2)(4)(5) \text{ 回路: } -U_2 - 2 - U_3 - 3 &= 0 & U_3 &= 14V \\
 \text{在 } (1)(4)(5) \text{ 回路: } U_3 + U_7 - 8 &= 0 & U_7 &= -6V
 \end{aligned}$$

2.9.



$$1 \text{ 回路: } -I_4 \times 5 + 14 + 5 = 0$$

$$2 \text{ 回路: } I_3 \times 8 + I_4 \times 5 - 3 = 0$$

$$I_4 = 3.8A \quad I_3 = -2A$$

$$\text{最外圈回路: } I_3 \times 8 + 14 - I_1 \times 2 = 0$$

$$I_1 = -1A$$

$$\text{① 网孔面内: } I_3 + \frac{I_1}{L_1} - 1 - I_2 = 0 \quad I_2 = -4A$$

$$I_1 = -1A, I_2 = -4A, U_{ab} = I_3 \times 6 + I_4 \times 5 = 7V$$

2.10.

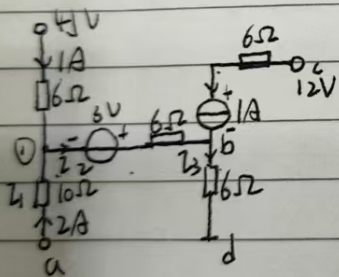
$$U_1 = L_4(x)$$

最外圈回路: $-10 + Z_4 \times 1 + Z_5 \times 2 + Z_3 \times 3 = 0$

对节点①: $Z_3 - Z_4 + Z_1 = 0$

对包面②: $l_1 + l_3 - l_4 - l_2 = 0$

Z.11.



①第5: $I_2 - I_1 - 1 = 0$ $I_2 = 3A$

$$P_0 = I_2 \times U = 9W \text{ (产生功率) 非关联正}$$

节点: $I_3 - I_2 - 1 = 0$ $I_3 = 4A$

$$c \rightarrow d: V_{cd} = 6 \times 1 + V_I + 2 \times 6 = 12$$

$$V_I = -18V$$

$$P_L = I U_L = -18W \text{ (产生功率) 关联负}$$

$$V_{ab} = 2 \times 10 - 3 + 7.2 \times 6 = 35 \text{ V}$$

$$V_{b_L} = -V_1 - 1 \times 6 = 12 \text{ V}$$

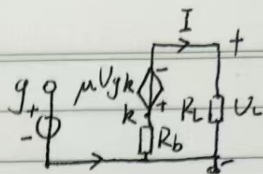
2014

$$Z.14: U_{yk} = U_s + I R_B$$

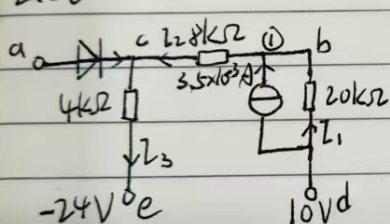
右回路:

$$I R_B + \mu U_{yk} + I U_L = 0$$

$$I = - \frac{\mu U_s}{R_B + \mu R_B + R_L} \quad U_L = I R_L = - \frac{\mu U_s R_L}{R_B + \mu R_B + R_L}$$



Z.20



设二极管导通 $U_c = U_a = -4$

$$U_{dc} = I_1 \times 20k + I_2 \times 8k = 14$$

$$\text{①节点: } I_2 - I_1 - 3.5 \times 10^{-3} = 0$$

$$I_1 = -5 \times 10^{-4} A \quad I_2 = 3 \times 10^{-3} A$$

$$U_{ce} = I_3 \times 4k = 20$$

$$I_3 = 5 \times 10^{-3} A$$

$$\text{c节点: } -I_1 - I_2 + I_3 = 0$$

$$I_1 = 2 \times 10^{-3} A$$

$$U_{db} = U_d - U_b = I_1 \times 20k = -10$$

$$U_b = 20V$$

当截止, $I_2 = I_3$

$$U_{de} = I_1 \times 20k + 12 I_2 = 34$$

$$I_1 = -\frac{1}{4} \times 10^{-3} A \quad I_2 = 3.25 \times 10^{-3} A$$

$$\text{①节点: } I_2 - I_1 - 3.5 \times 10^{-3} = 0$$

$$U_{dc} = U_d - U_c = I_1 \times 20k + I_2 \times 8k = 21V$$

故 $U_a = -11V$ 时, 截止