



* FÖZÜM :

Denklemler:

$$(1) 20 I_{s1} + 10 I_{s2} + 10 I_{s3} = 50$$

$$(2) 10 I_{s1} + 10 I_{s2} + 10 I_{s3} + V_1 = 0$$

$$(3) 10 I_{s1} + 10 I_{s2} + 20 I_{s3} + 5 I_{s4} = 20$$

$$(4) -5 I_{s3} + 5 I_{s4} + V_2 = 0$$

Ek Denklemler:

$$(5) I_{s2} = 1A$$

$$(6) I_{s4} = 2A$$

$$(1) \text{ den} \Rightarrow 20 I_{s1} + 10 I_{s3} = 40 \text{ --- (7)}$$

$$(3) \text{ ten} \Rightarrow 10 I_{s1} + 20 I_{s3} = 20 \text{ --- (8) } \times 2$$

$$\Rightarrow 20 I_{s1} + 40 I_{s3} = 40 \text{ --- (9)}$$

$$(9) - (7) \Rightarrow 3 I_{s3} = 0 \Rightarrow \boxed{I_{s3} = 0A}$$

$$(7) \text{ den} \Rightarrow \boxed{I_{s1} = 2A}$$

$$(2) \text{ den} \Rightarrow 20 + 10 + 0 + V_1 = 0 \Rightarrow \boxed{V_1 = -30V}$$

$$(4) \text{ den} \Rightarrow 0 + 10 + V_2 = 0 \Rightarrow \boxed{V_2 = -10V}$$

* Akım lar :

$$I_3 = I_{s1} = 2A$$

$$I_4 = I_{s3} = 0A$$

$$I_5 = (I_{s1} + I_{s2} + I_{s3}) = 3A$$

$$I_6 = (I_{s4} - I_{s3}) = 2A$$

$$I_7 = I_{s1} = 2A$$

$$I_8 = I_{s3} = 0A$$

$$I_1 = 1A \left. \begin{array}{l} \text{Akım} \\ \text{Kaynak} \end{array} \right\}$$

$$I_2 = 2A$$

Geri Limiter:

$$U_1 = -30 \text{ V}$$

$$U_2 = -10 \text{ V}$$

$$U_3 = R_1 \cdot I_3 = 20 \text{ V}$$

$$U_4 = R_2 \cdot I_4 = 0 \text{ V}$$

$$U_5 = R_3 \cdot I_5 = 30 \text{ V}$$

$$U_6 = R_4 \cdot I_6 = 10 \text{ V}$$

$$R_1 = 10 \Omega$$

$$R_2 = 5 \Omega$$

$$R_3 = 10 \Omega$$

$$R_4 = 5 \Omega$$