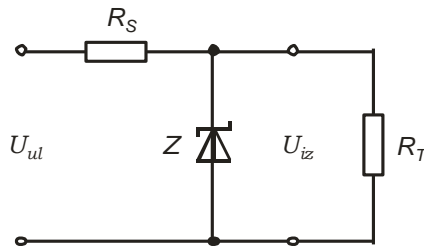
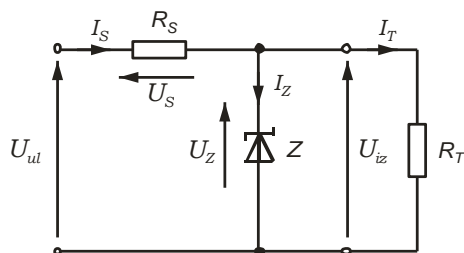


9. domaća zadaća iz Osnova elektrotehnike i elektronike

1. Izračunajte snagu P_S otpornika R_S te snagu P_Z Zenerove diode, ako je: a) $R_T = 20 \Omega$, b) $R_T = \infty$, c) $R_T = 0$. Još je poznato: $U_{ul} = 8 \text{ V}$, $R_S = 10 \Omega$, $U_Z = 5 \text{ V}$.



Rješenje:



Kirchhoffovi zakoni

$$I_S = I_Z + I_T$$

$$U_{ul} = U_S + U_Z = R_S \cdot I_S + U_Z$$

$$U_{iz} = U_Z$$

a) $R_T = 20 \Omega$

$$I_T = \frac{U_{iz}}{R_T} = \frac{5}{20} = 250 \text{ mA}$$

$$I_S = \frac{U_{ul} - U_{iz}}{R_S} = \frac{8 - 5}{10} = 300 \text{ mA}$$

$$I_Z = I_S - I_T = 50 \text{ mA}$$

$$P_S = I_S^2 \cdot R_S = 900 \text{ mW}$$

$$P_Z = U_Z \cdot I_Z = 250 \text{ mW}$$

b) $R_T = \infty$

$$I_T = \frac{U_{iz}}{R_T} = 0$$

$$I_S = \frac{U_{ul} - U_{iz}}{R_S} = 300 \text{ mA}$$

$$I_Z = I_S - I_T = 300 \text{ mA}$$

$$P_S = I_S^2 \cdot R_S = 900 \text{ mW}$$

$$P_Z = I_S^2 \cdot R_S = 1,5 \text{ W}$$

c) $R_T = 0$

$$U_{iz} = 0, \quad U_Z = 0$$

$$I_Z = 0$$

$$I_S = \frac{U_{ul} - U_{iz}}{R_S} = 800 \text{ mA}$$

$$(I_T = I_S - I_Z = I_S)$$

$$P_S = I_S^2 \cdot R_S = 6,4 \text{ W}$$

$$P_Z = U_Z \cdot I_Z = 0$$