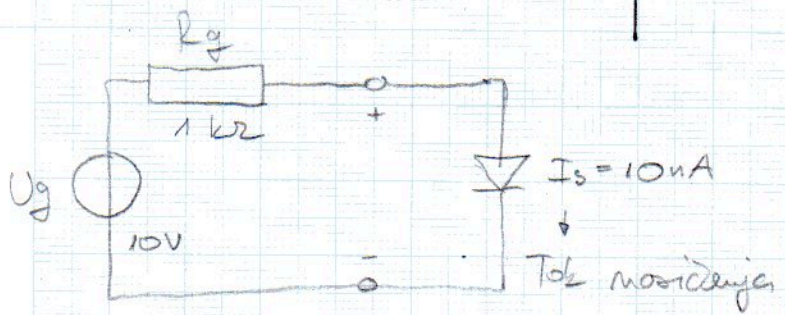


I [mA]	U [V]
0	∅
0,01	0,17
0,1	0,24
1	0,3
5	0,34
10	0,36



$$I = I_s \left( e^{\frac{U}{U_T}} - 1 \right)$$

$U_{max} = 10V$   
 $I_{max} = \frac{U_0}{R_g} = 10mA$

Boltzmann constant  
 $U_T = \frac{k \cdot T}{q}$

Thermal voltage  
 $U_T = 25,9 mV$

$$U = U_T \cdot \ln \frac{I + I_s}{I_s}$$

1. Izračunamo napetost U

$$U = U_T \cdot \ln \frac{I + I_s}{I_s} = \boxed{0,357 \text{ V}}$$

2. Pri napetosti U izračunamo tok I

$$I = \frac{U_g - U}{R_g} = \boxed{9,643 \text{ mA}}$$

3. Pomenu izračunamo napetost U pri toku izračunanim v točki 2.

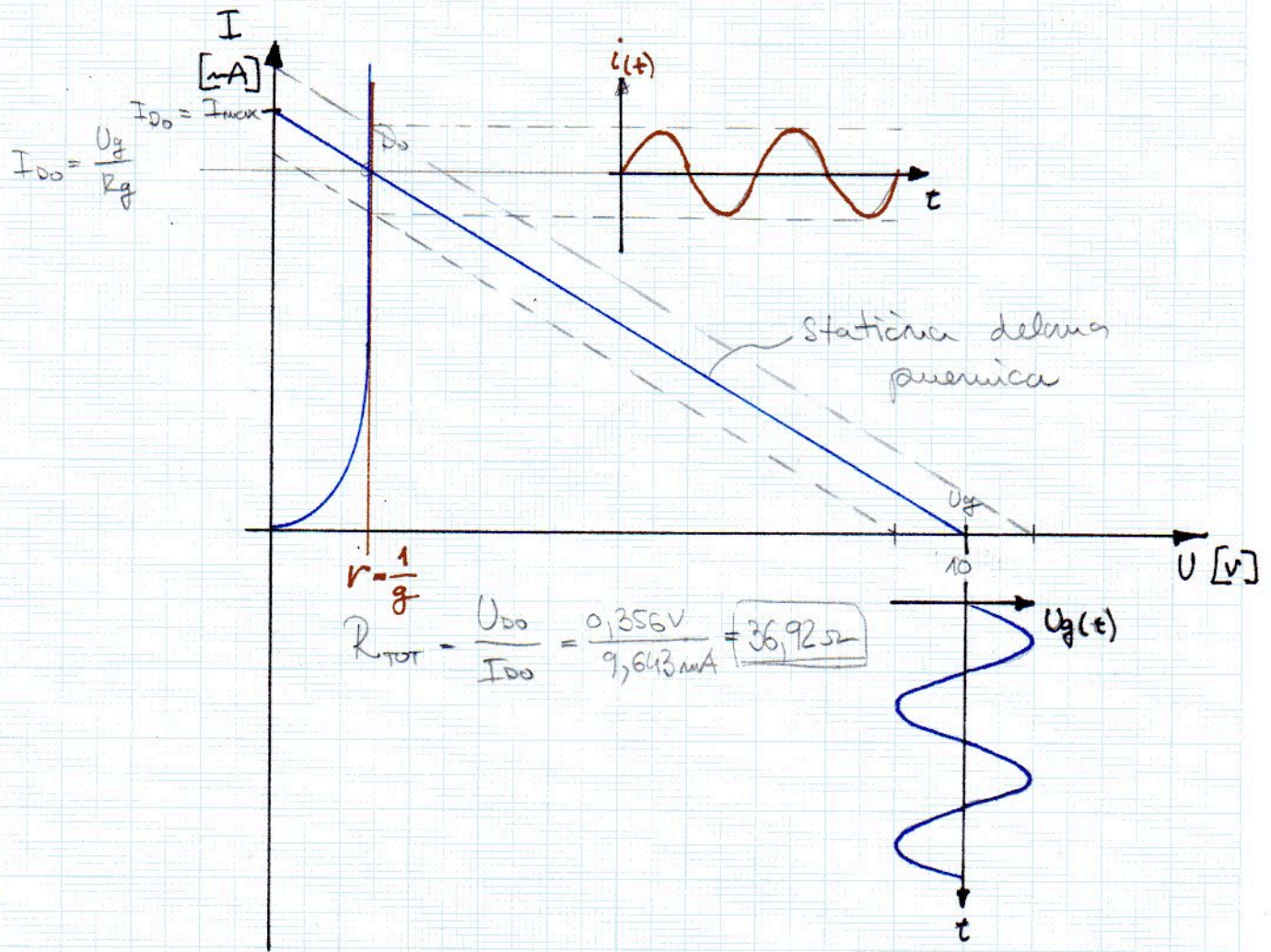
$$U_2 = U_T \cdot \ln \frac{I_2 + I_s}{I_s} = \boxed{0,356 \text{ V}}$$

4. Izračunamo tok pri napetosti U<sub>2</sub>.

$$I = \frac{U_g - U_2}{R_g} = \boxed{9,643 \text{ mA}}$$

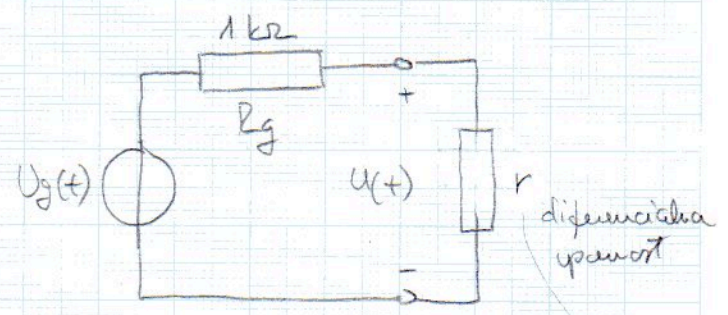
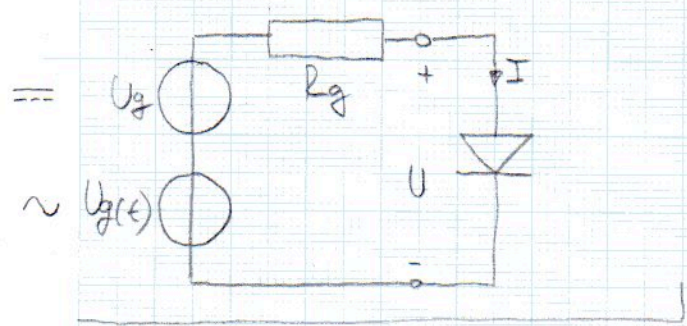
i enako, delno tako dolgo da pride do začetne nastavitve.

D<sub>0</sub> (9,64 mA; 0,356 V)



$$r = \frac{1}{g}$$

$$R_{TOT} = \frac{U_{D0}}{I_{D0}} = \frac{0,356V}{9,643 \mu A} = 36,92 \Omega$$



$$U_g(t) = 0,1 \cdot \sin(\omega t)$$

$$i(t) = \frac{U(t)}{R_g + r}$$

$$r = \frac{du}{di}; g = \frac{di}{du}$$

$$I_{D0} = I = I_s \cdot (e^{\frac{U}{U_T}} - 1)$$

$$= I_s \cdot e^{\frac{U}{U_T}} - I_s \Rightarrow I_{D0} + I_s = I_s \cdot e^{\frac{U}{U_T}}$$

$$g = \frac{dI}{dU} = I_s \cdot e^{\frac{U}{U_T}} \cdot \frac{1}{U_T} \Rightarrow g = \frac{I_{D0} + I_s}{U_T} = 0,373 S \Rightarrow r = \frac{1}{g} = 2,683 \Omega$$

$$i(t) = \frac{U_s(t)}{R_g + R} = \frac{0,1 \text{ A} \cdot \sin(\omega t)}{1 \cdot 10^3 \Omega + 2,683 \Omega} = 9,1 \text{ mA} \cdot \sin(\omega t)$$

$$u(t) = i(t) \cdot R = 0,1 \text{ mA} \cdot \sin(\omega t) \cdot 2,683 \Omega = 0,268 \text{ mV} \cdot \sin(\omega t)$$

$$u_{\text{mel}}(t) = [0,365 + 0,268 \cdot 10^{-3} \cdot \sin(\omega t)] \text{ V}$$

$$i_{\text{mel}}(t) = [9,64 + 0,1 \cdot \sin(\omega t)] \cdot 10^{-3} \text{ A}$$