
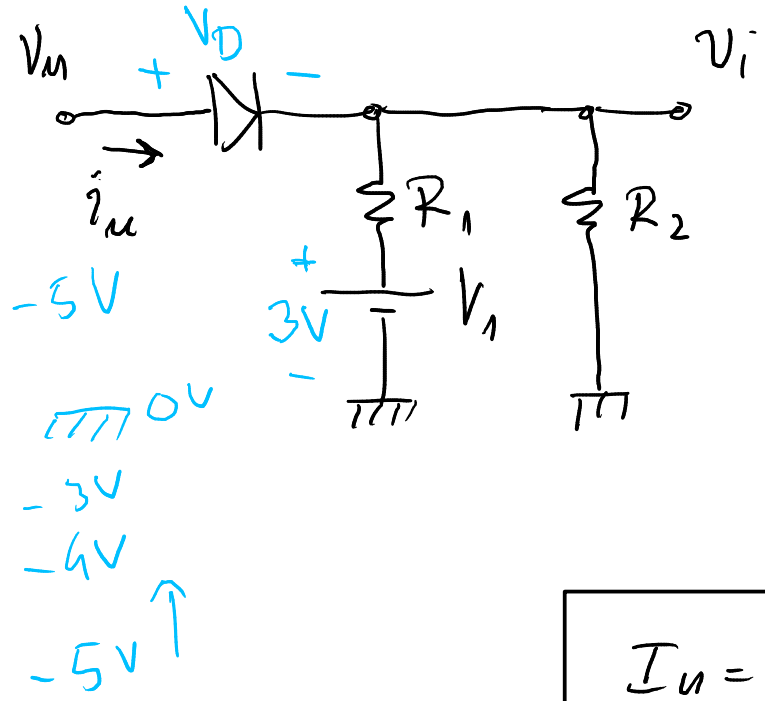


Ⓐ $v_i = f(v_m)$

Ⓑ $i_m = f(v_m)$

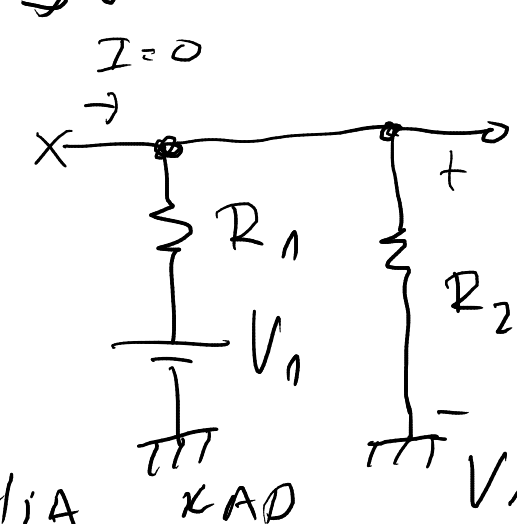
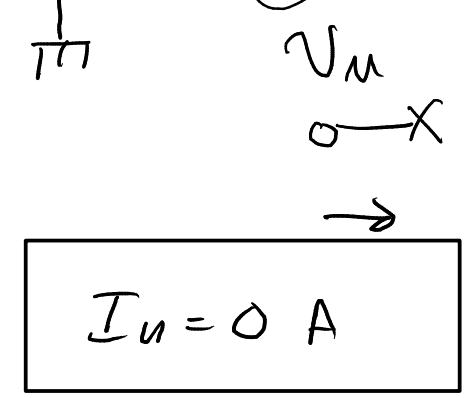
① KADA D VODI U DIREKTIJOM SMERU \equiv 

② KADA JE DIODA NA GRANICI VODETHA $V_D = V_{AK} \approx V_{D0} \Rightarrow I_D \rightarrow 0A$



$V_u = [-5V ; 5V]$; $V_1 = 3V$, $R_1 = 2k\Omega$
 $R_2 = 3k\Omega$, $r_d = 20\Omega$
 $V_D = V_u - V_i$

① $V_u = -5V$ D JE VODI

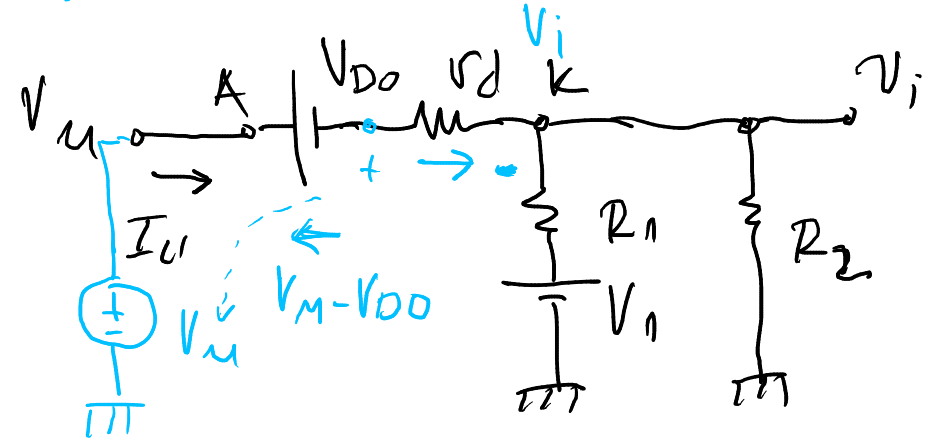


$$\begin{aligned}
 V_i &= \frac{R_2}{R_2 + R_1} \cdot V_1 \\
 &= \frac{3}{5} V \\
 &= 1.8 V
 \end{aligned}$$

$V_u = 1.8V + V_{D0} ?$
 $0.7V$

② STARIJE U KOLU SE MEHJA

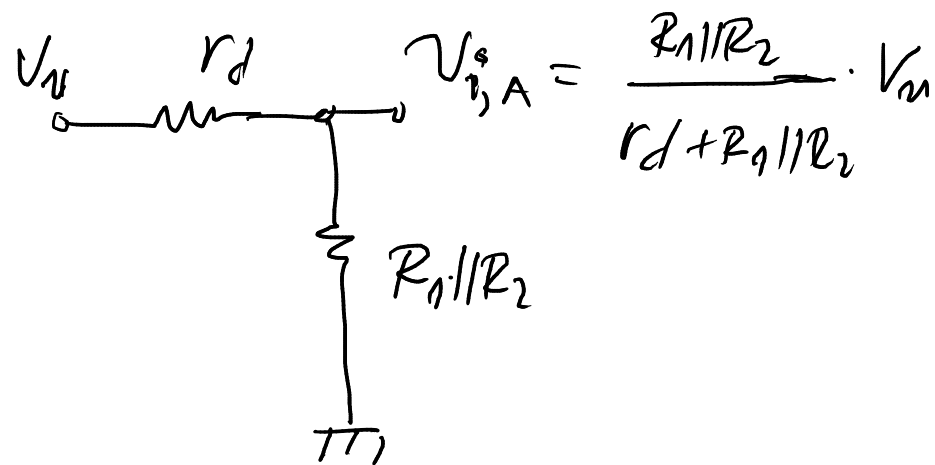
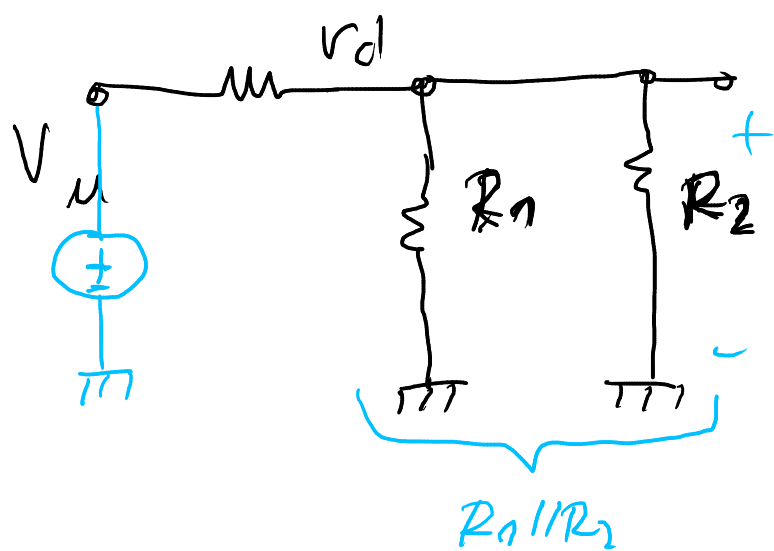
$V_u = 2.5V$ @ $V_{D0} = 0.7V$



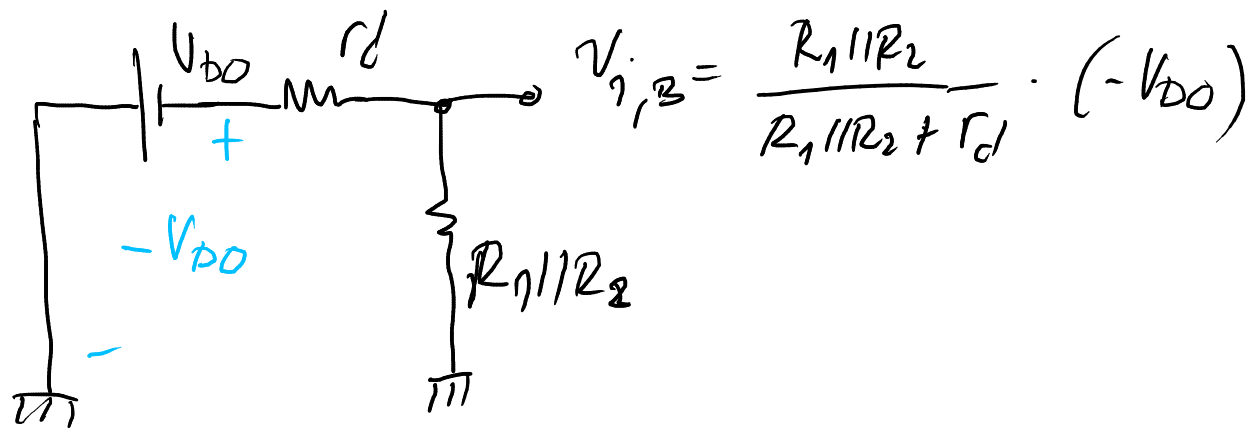
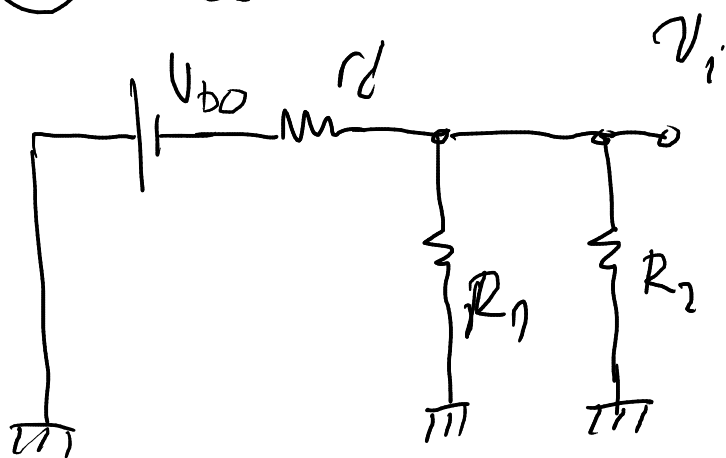
$$I_u = \frac{V_u - V_{D0} - V_i}{r_d}$$

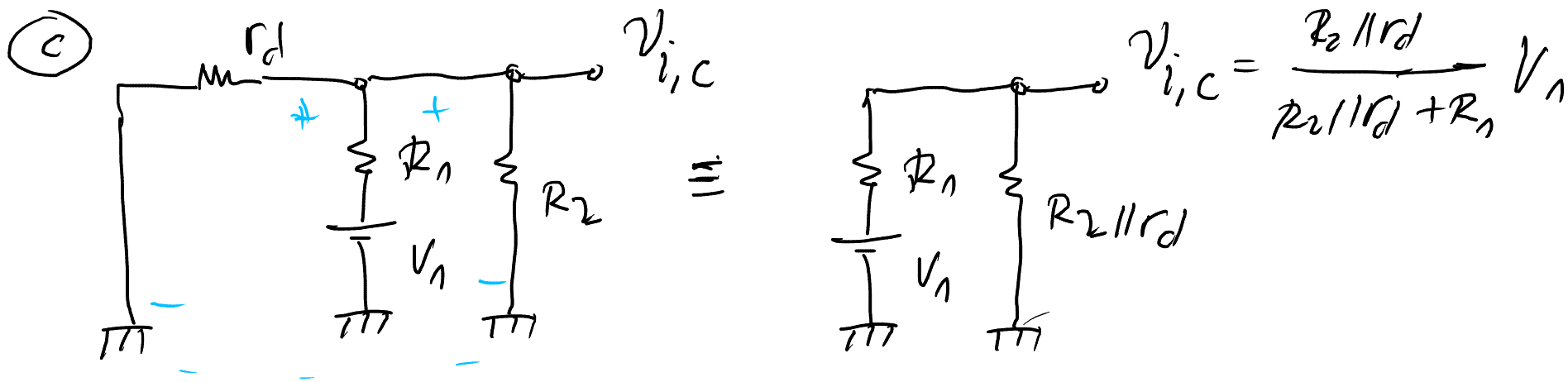
$V_i = ?$ (SUPERPOZICIJA)

(A) $V_{in} \neq 0V$



(B) $V_{DD} \neq 0V$





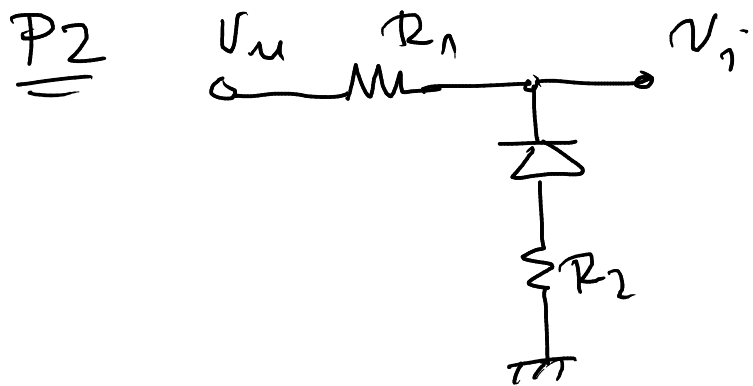
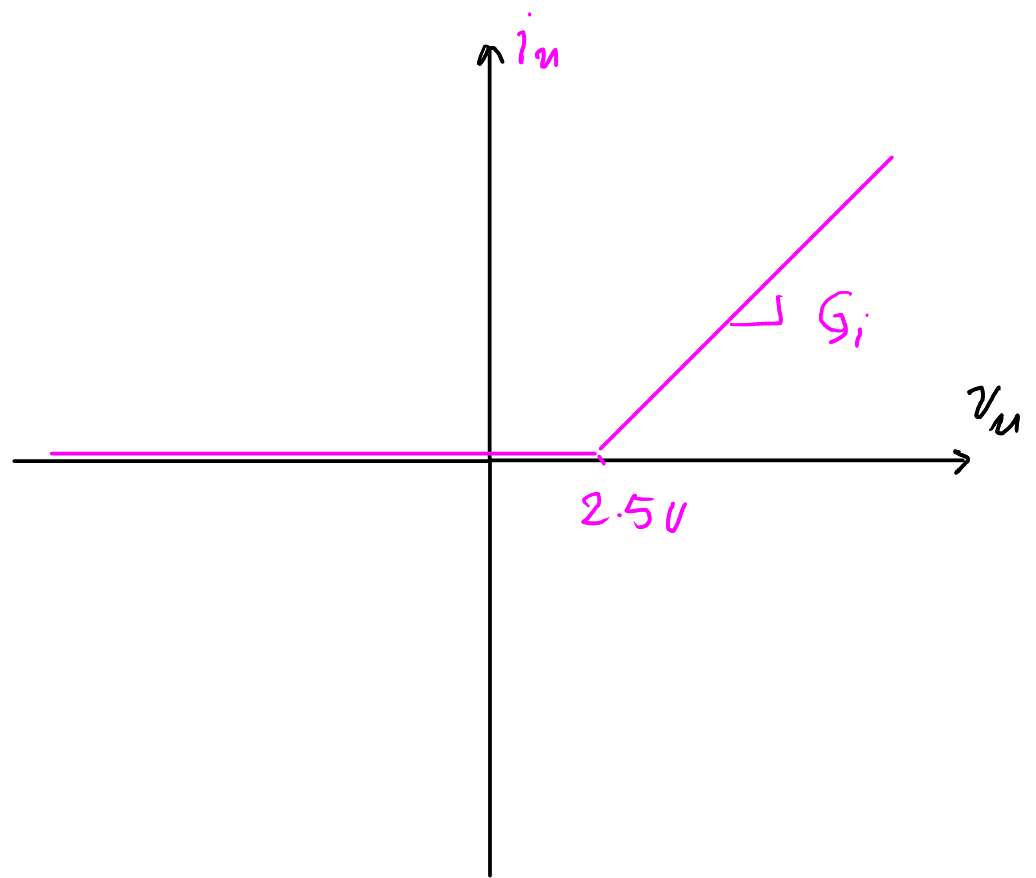
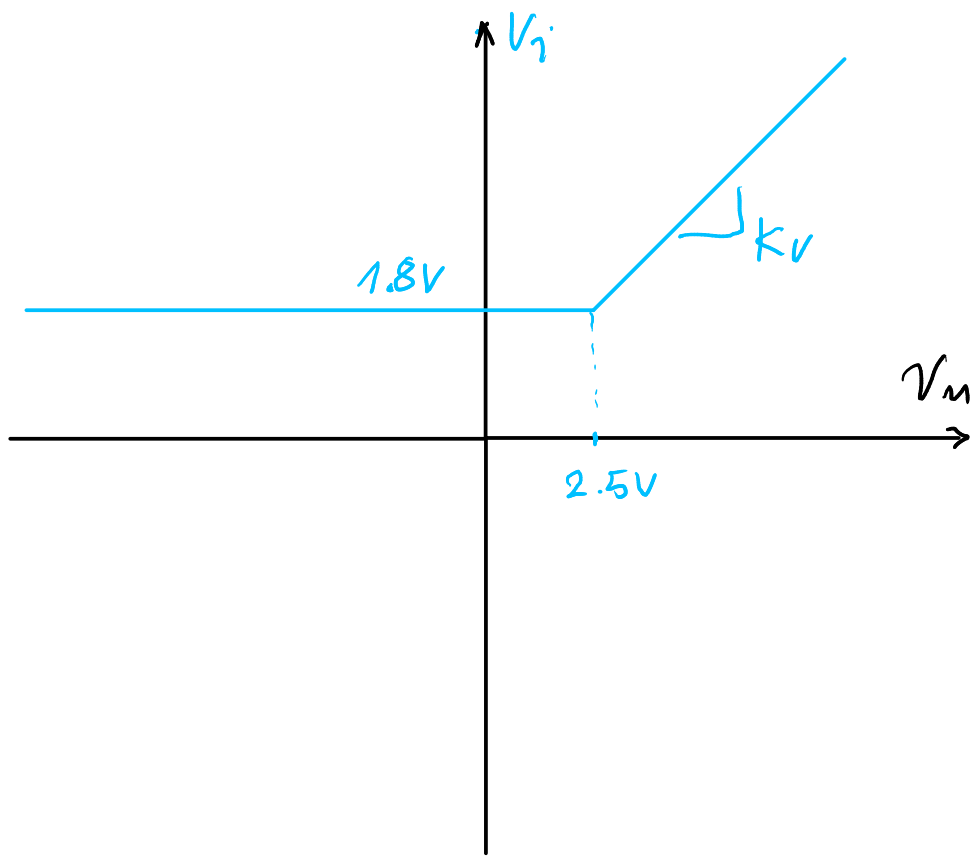
$$V_i \equiv V_{i,A} + V_{i,B} + V_{i,c} = V_{i,0} + V_{i,A} \equiv \frac{k_v \cdot V_u + V_n}{R_1 \parallel R_2 + r_d};$$

$$k_v \equiv \frac{R_1 \parallel R_2}{R_1 \parallel R_2 + r_d}, \quad V_n \equiv V_{i,B} + V_{i,c}; \quad \boxed{V_i = k_v \cdot V_u + V_n}$$

$$i_{ci} = \frac{V_u - V_{DD} - V_i}{r_d} = \frac{\downarrow V_u - V_{DD} - \downarrow k_v V_u - \downarrow V_n}{r_d} = \frac{\downarrow (1 - k_v) V_u - \downarrow (V_n + V_{DD})}{r_d}$$

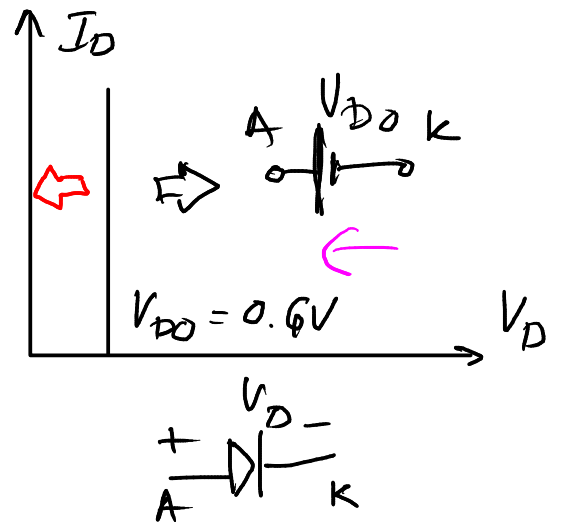
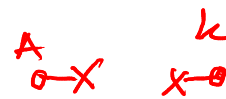
$$\boxed{i_u = G_i V_u + I_n}$$

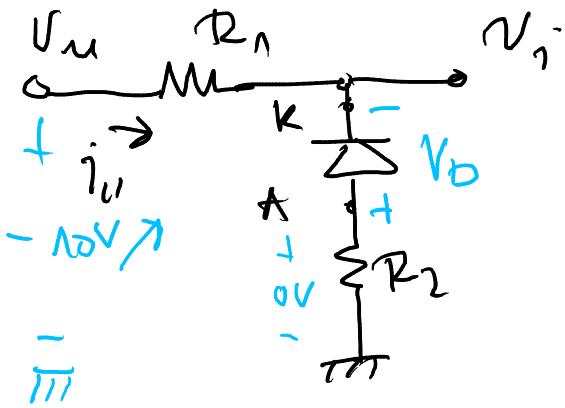
$$G_i = \frac{1 - k_v}{r_d}; \quad I_n \equiv - \frac{(V_n + V_{DD})}{r_d}$$



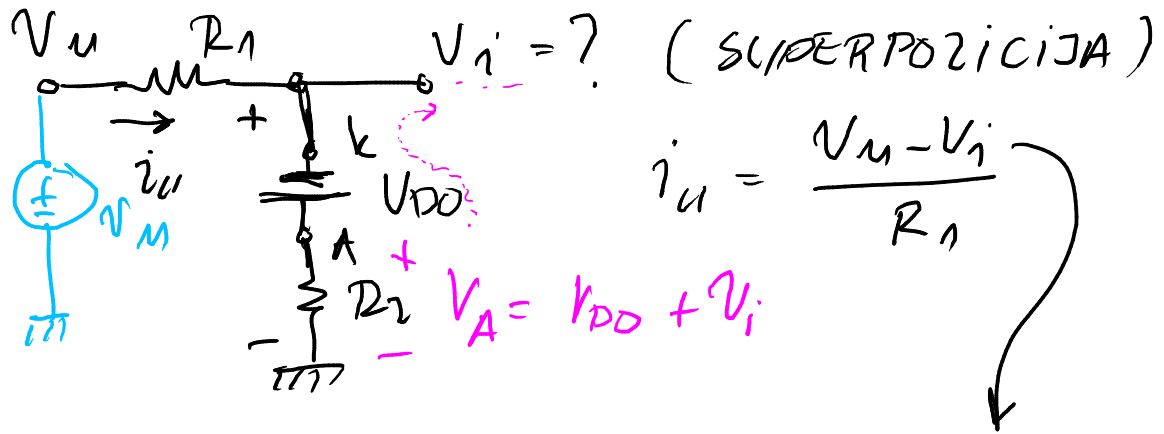
MODEL DIODE 3E:

$$v_u = [-10, 10] V$$

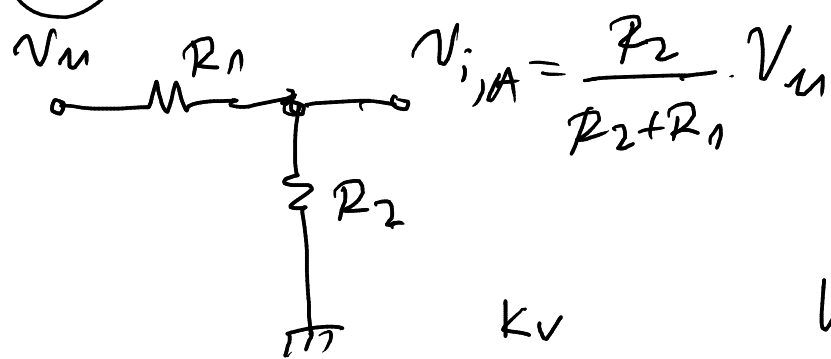




① $V_M = -10V \Rightarrow$ D vodi D



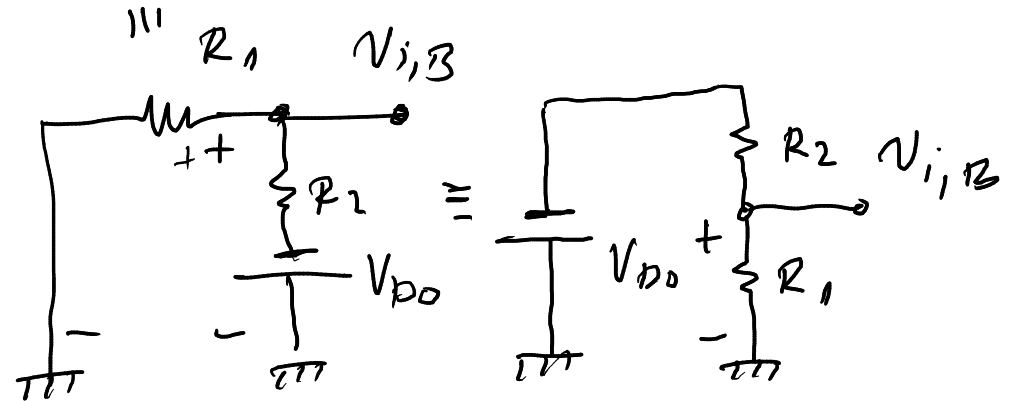
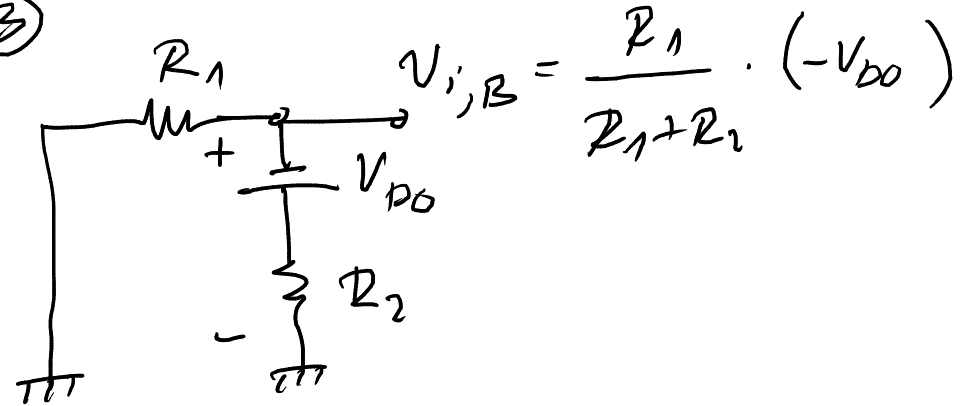
Ⓐ $V_M \neq 0$



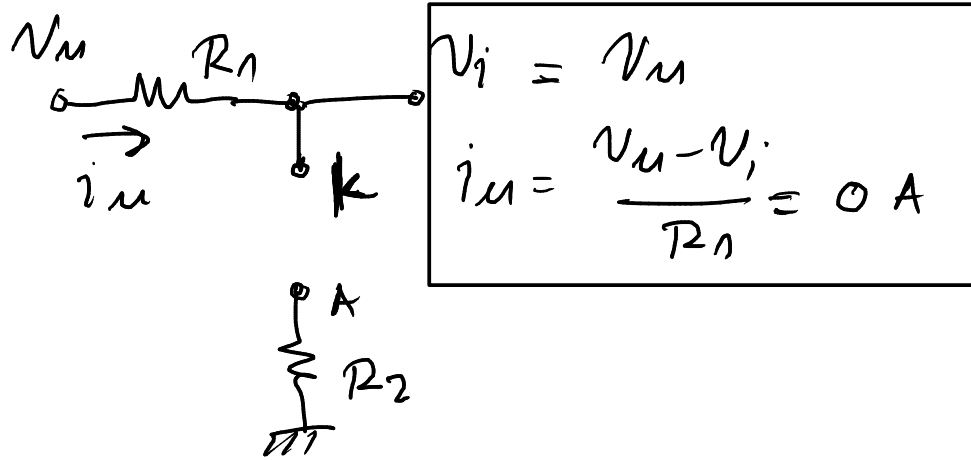
$$V_i = V_{i,A} + V_{i,B} = \frac{R_2}{R_2 + R_1} \cdot V_M - \frac{R_1}{R_1 + R_2} V_{D0}$$

$$V_i = K_V \cdot V_M - V_n$$

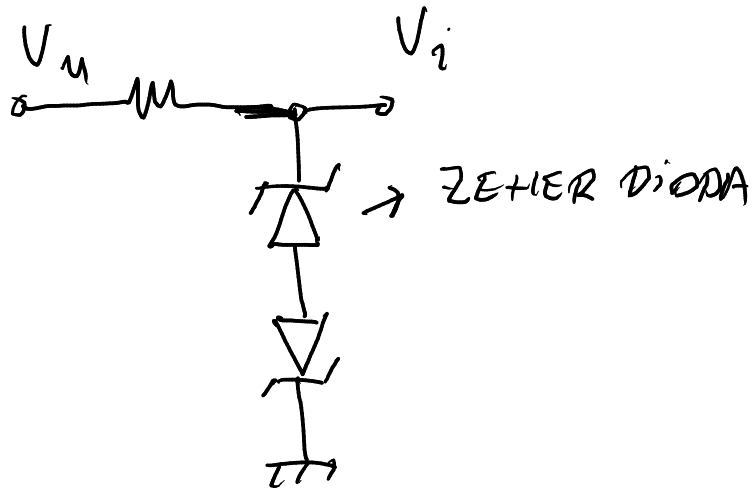
Ⓑ



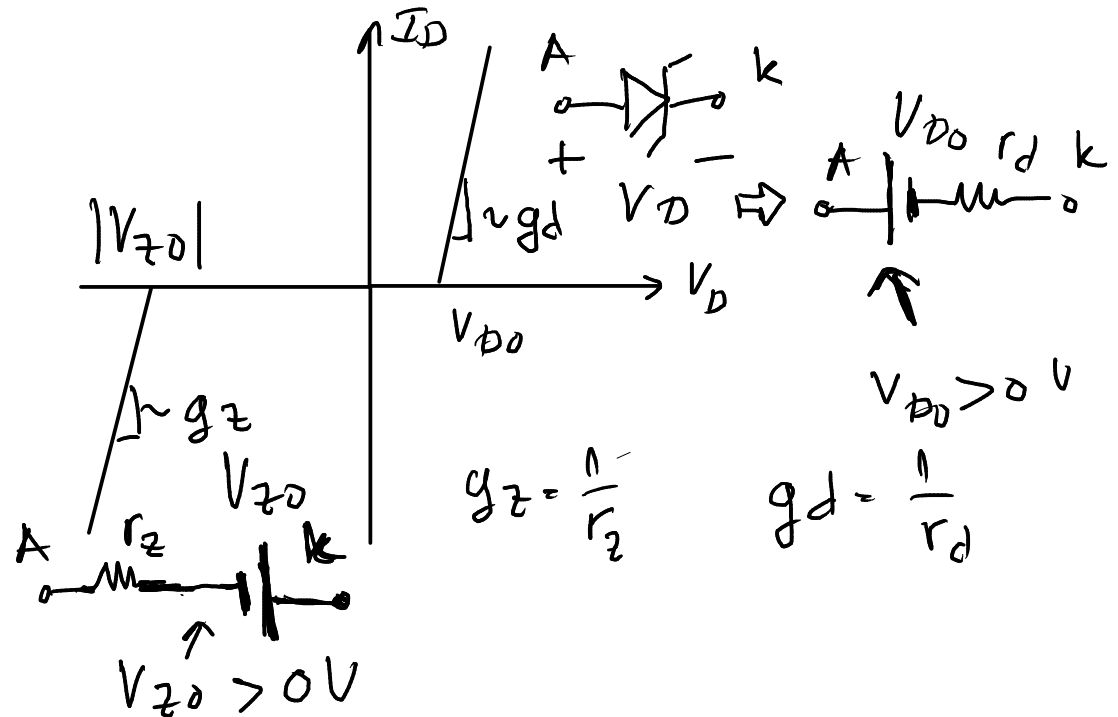
② KADA $V_M \approx -V_{D0} \Rightarrow D$ JE VODI.



P3

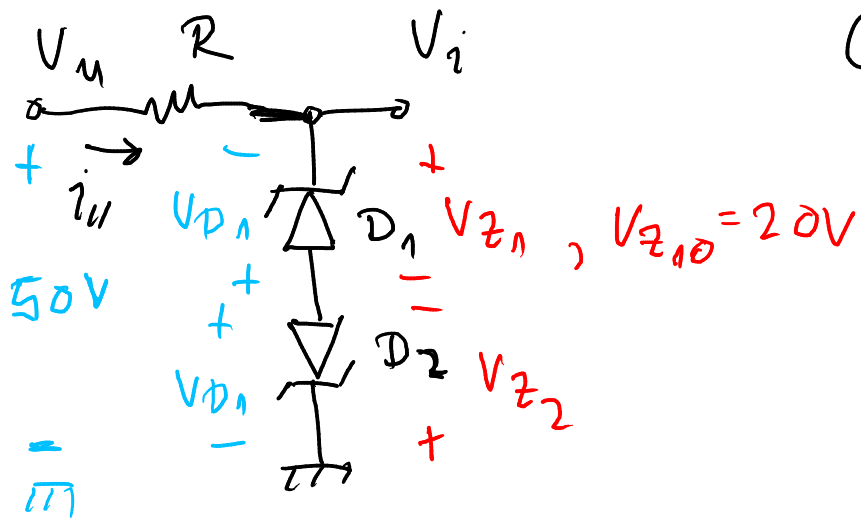


$$V_M = [-50, 50] \text{ V}$$

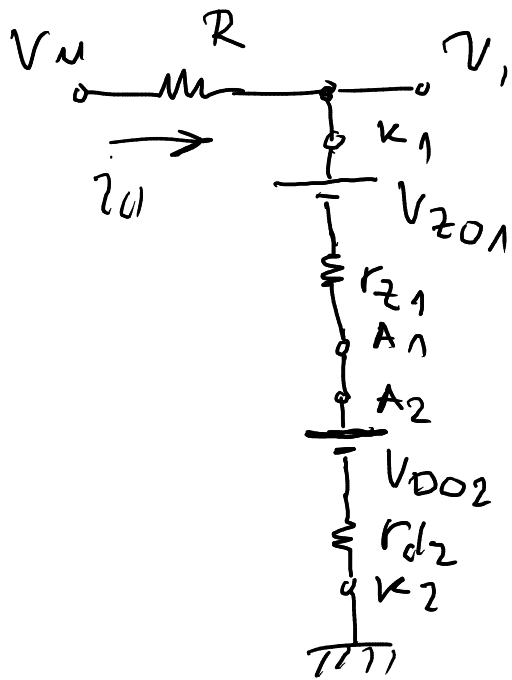


$$V_{Z0} = 20 \text{ V} ; V_{D0} = 0.7 \text{ V}$$

$$r_z = 15 \Omega ; r_d = 30 \Omega$$

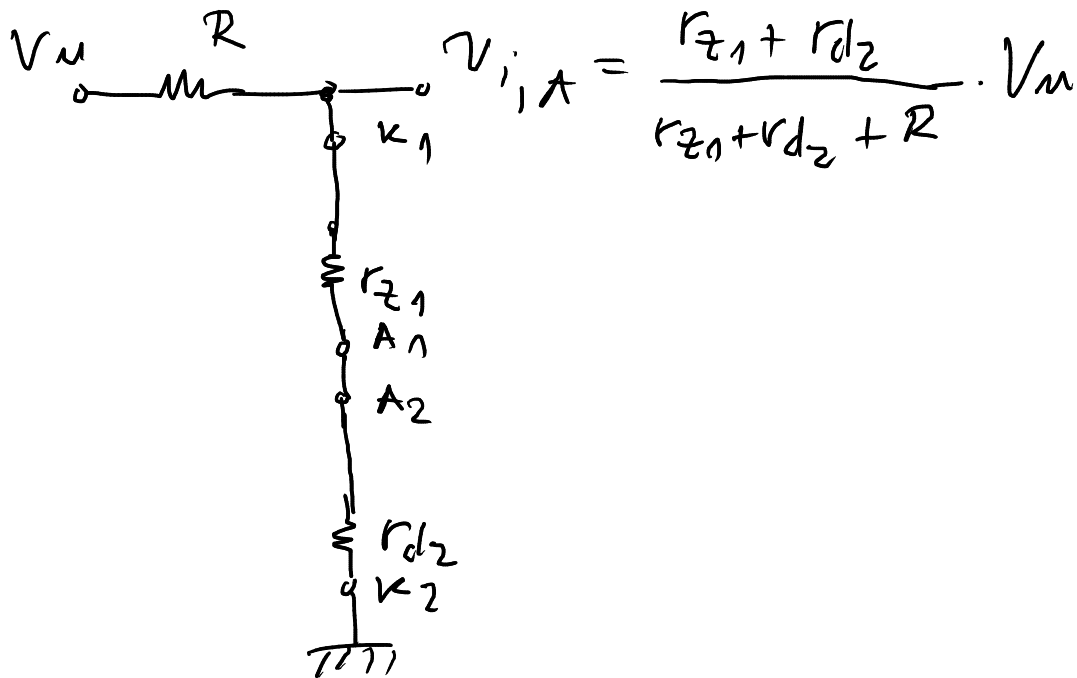


① $V_u = 50V \Rightarrow D_1$ VODI INVERZIO
 D_2 VODI DIREKZIO

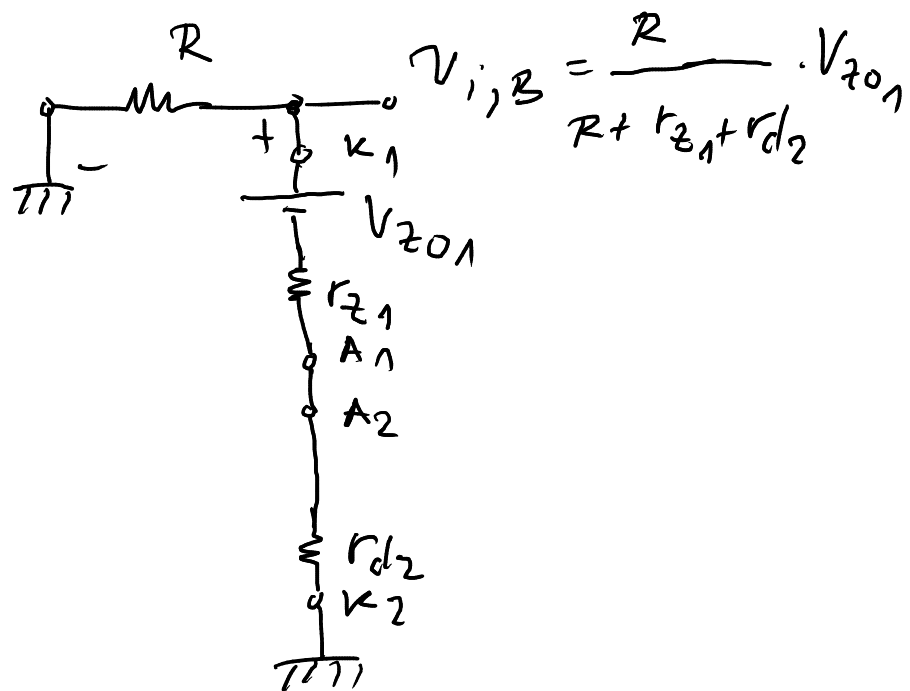


$$i_u = \frac{V_u - V_i}{R}$$

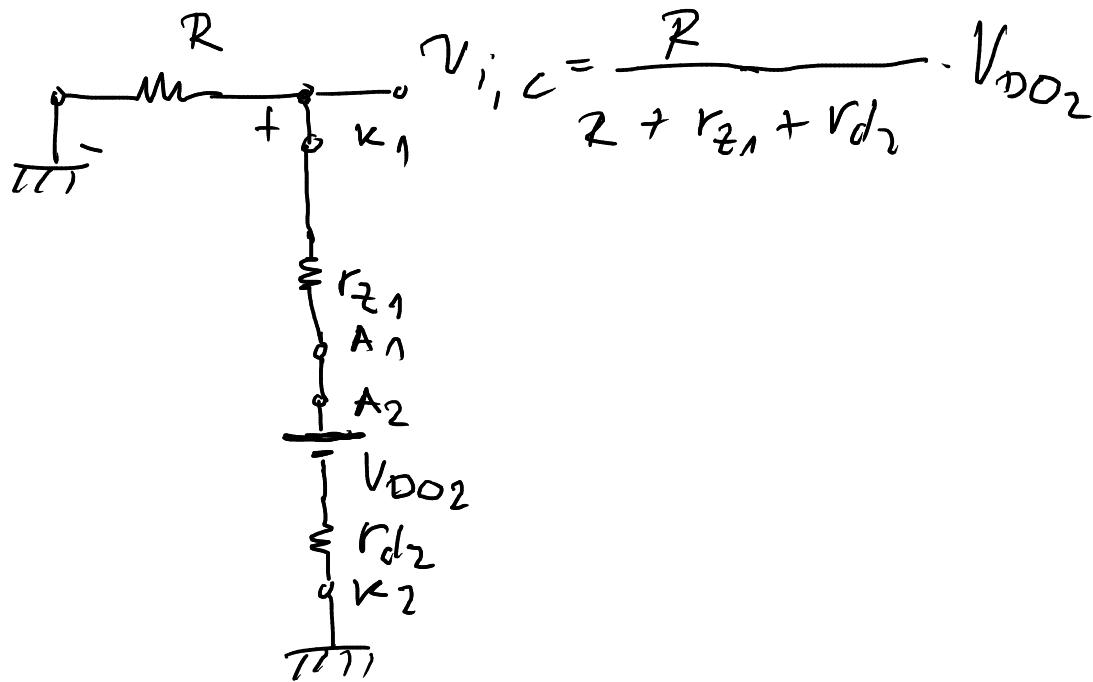
② $V_u \neq 0V$



③ $V_{Z01} \neq 0$



③ $V_{D02} \neq 0$



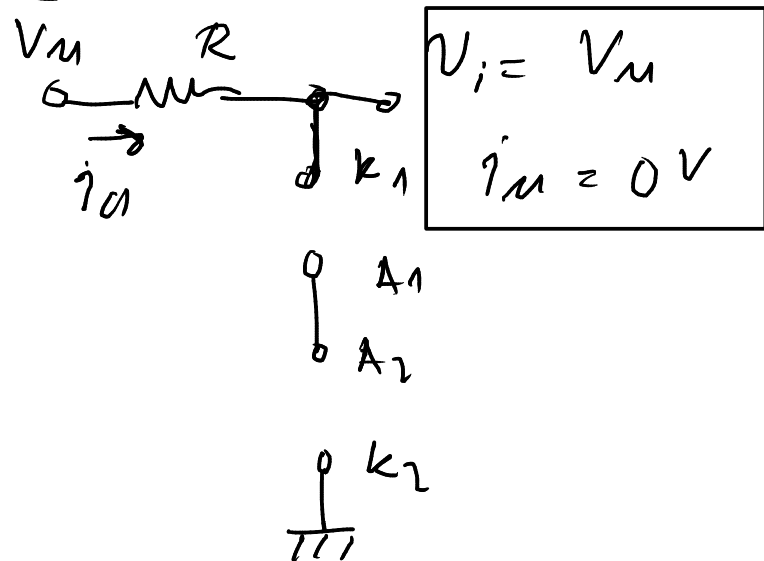
; $V_i = V_{i,A} + V_{i,B} + V_{i,C}$

$$V_i = K_v \cdot V_m + V_n$$

$$V_n = V_{i,B} + V_{i,C}$$

$$K_v = \frac{r_{z1} + r_{d2}}{r_{z1} + r_{d2} + R}$$

② $\text{ZA } V_u < V_{z01} + V_{D02} = 20.7V \Rightarrow D_1 \text{ \& } D_2 \text{ NE VODE}$



■ НАПОМЕНА: ЗА ДОМАЋИ
ДОВРŠИТИ П3 ?