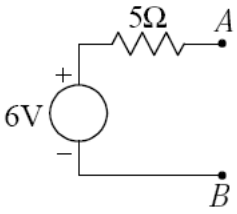
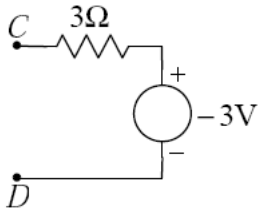
REŠENJA

1.

a) $U_{TEV1} = 6\text{V}$, $R_{TEV1} = 5\Omega$.



b) $U_{TEV2} = -3\text{V}$, $R_{TEV2} = 3\Omega$.



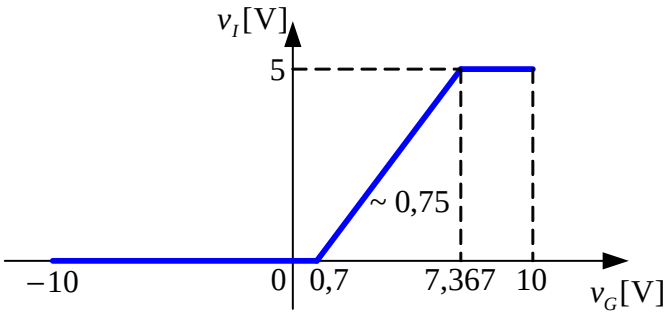
c) $I_X = 0{,}5\text{A}$, $P_{4\Omega} = 1\text{W}$.

3.

Za $-10\text{V} \le v_G \le 0{,}7\text{V}$: $D-OFF, DZ-OFF, v_I = 0 = const.$

Za $0{,}7\text{V} \le v_G \le 7{,}367\text{V}$: $D-ON, DZ-OFF, v_I[\text{V}] = 0{,}75 v_G[\text{V}] - 0{,}525$

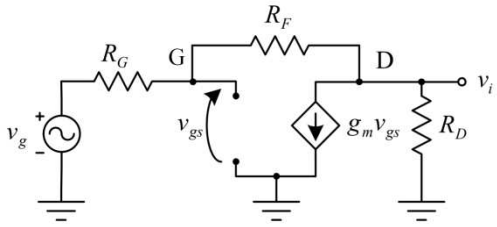
Za $7{,}367\text{V} \le v_G \le 10\text{V}$: $D-ON, DZ-proboj, v_I = 5\text{V} = const.$



6. a)

$$I_D = \frac{k_p}{2}(V_{SG} - |V_P|)^2$$
$$V_{SG} = V_S - V_G$$
$$V_G = V_D = I_D R_D$$
$$V_{SG} = V_{DD} - I_D R_D$$
$$I_D = \frac{k_p}{2}(V_{DD} - I_D R_D - |V_P|)^2$$
$$I_D = 2mA$$

b)

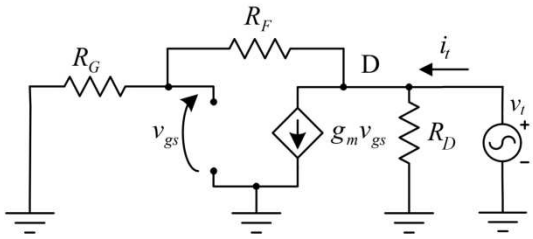


$$A_V = \frac{R_D(1 - g_m R_F)}{R_D + R_F + R_G + g_m R_D R_G} = -3.26$$

c)

$$i_g = \frac{v_g - v_i}{R_G + R_F} = \frac{v_g - A_V v_g}{R_G + R_F}$$

$$R_U = \frac{v_g}{i_g} = \frac{R_G + R_F}{1 - A_V} \approx 14.1k\Omega$$



$$i_t = g_m v_{gs} + \frac{v_t}{R_F + R_G} + \frac{v_t}{R_D}$$

$$v_{gs} = v_t \frac{R_G}{R_G + R_F}$$

$$R_i = \frac{v_t}{i_t} = \frac{1}{\frac{g_m R_G}{R_G + R_F} + \frac{1}{R_F + R_G} + \frac{1}{R_D}} \approx 983\Omega$$