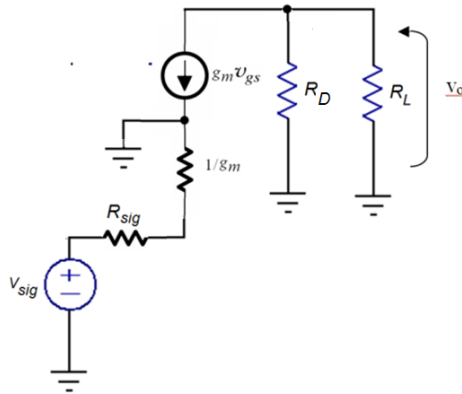


Gabarito de divulgação (Teste 8 PSI3024)

a) (AMBAS AS VERSÕES):



b)

Versão 1:

$$I_{DS} = \frac{1}{2} k'_n \frac{W}{L} (V_{GS} - V_t)^2 = \frac{1}{2} \cdot 0,1m \cdot 20 \cdot (V_{GS} - 1)^2 = 1mA \rightarrow V_{GS} = 2V$$

$$g_m = k'_n \frac{W}{L} (V_{GS} - V_t) = 0,1m \cdot 20 \cdot (2 - 1) = 2mS$$

$$G_V = g_m \cdot (R_D // R_L) \left(\frac{1/g_m}{1/g_m + R_{sig}} \right) = 2m \cdot 2k \cdot \left(\frac{500}{500 + 500} \right) = 2$$

$g_m = 2mS$

$G_V = 2$

Versão 2:

$$I_{DS} = \frac{1}{2} k'_n \frac{W}{L} (V_{GS} - V_t)^2 = \frac{1}{2} \cdot 0,1m \cdot 5 \cdot (V_{GS} - 1)^2 = 1mA \rightarrow V_{GS} = 3V$$

$$g_m = k'_n \frac{W}{L} (V_{GS} - V_t) = 0,1m \cdot 5 \cdot (3 - 1) = 1mS$$

$$G_V = g_m \cdot (R_D // R_L) \left(\frac{1/g_m}{1/g_m + R_{sig}} \right) = 1m \cdot 2k \cdot \left(\frac{1k}{1k + 1k} \right) = 1$$

$g_m = 1mS$

$G_V = 1$
