Elektronik Aufgabe 10:

a) T1: $U_{DS} \geq U_{GS} - U_{Th}$

$U_{DD} - U_{out} \geq U_{in} - U_{out} - U_{Th}$

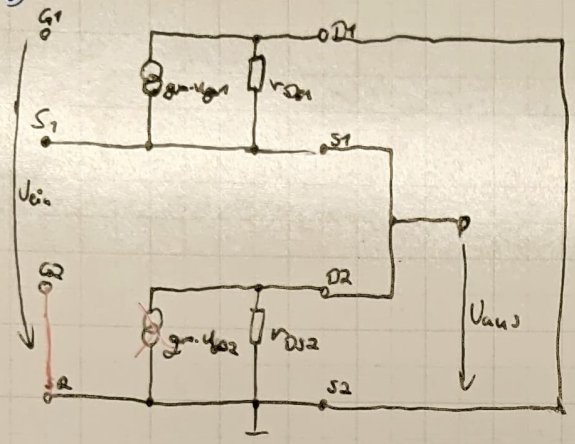
$U_{in} \leq U_{DD} + U_{Th}$

T2: $U_{DS} \geq U_{GS} - U_{Th}$

$U_{out} \geq U_{GS} - U_{Th}$

$\Rightarrow U_{out,min} = U_{GS} - U_{Th}$

b)



c) T1: $g_{m1} = \beta_0 \cdot \frac{W}{L} \cdot (U_{GS1} - U_{Th})$

$= \beta_0 \cdot \frac{W}{L} \cdot (U_{in} - U_{out} - U_{Th}) = 300\,\mu S$

$g_{DS1} = \frac{\beta_0}{2} \cdot \frac{W}{L} \cdot (U_{GS1} - U_{Th})^2 \cdot \lambda = 7{,}5\,mS$

$r_{DS1} = 133\,\Omega$

T2: $g_{DS2} = \frac{\beta_0}{2} \cdot \frac{W}{L} \cdot (U_{GS2} - U_{Th})^2 \cdot \lambda = 7{,}5\,mS$

$r_{DS2} = 133\,\Omega$