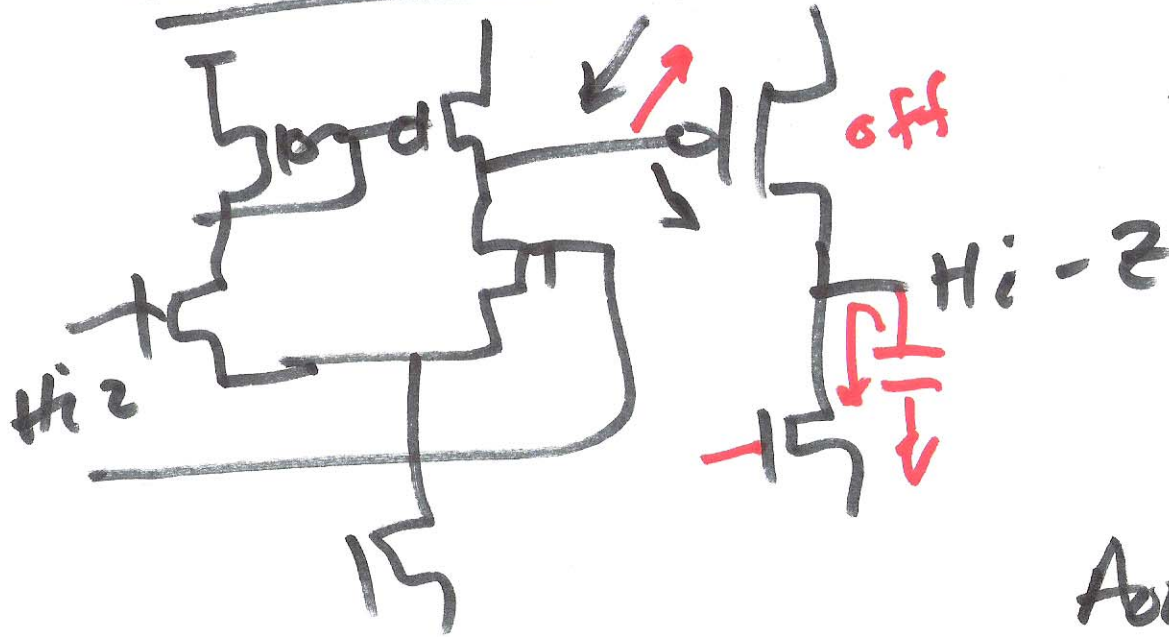
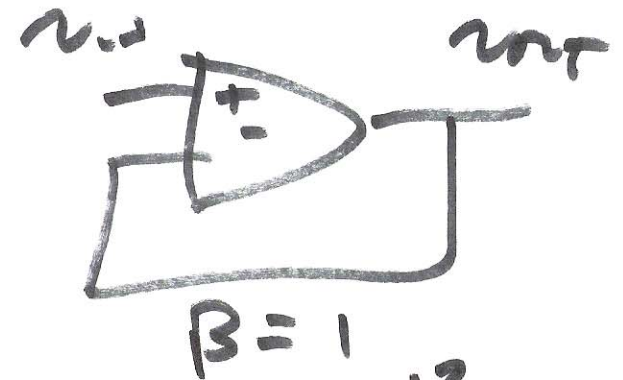


Sec. 24.3 OTAs

NOT OTA



$$R_{of} = \frac{r_{on} \parallel r_{op}}{1 + \beta A_{OL}}$$

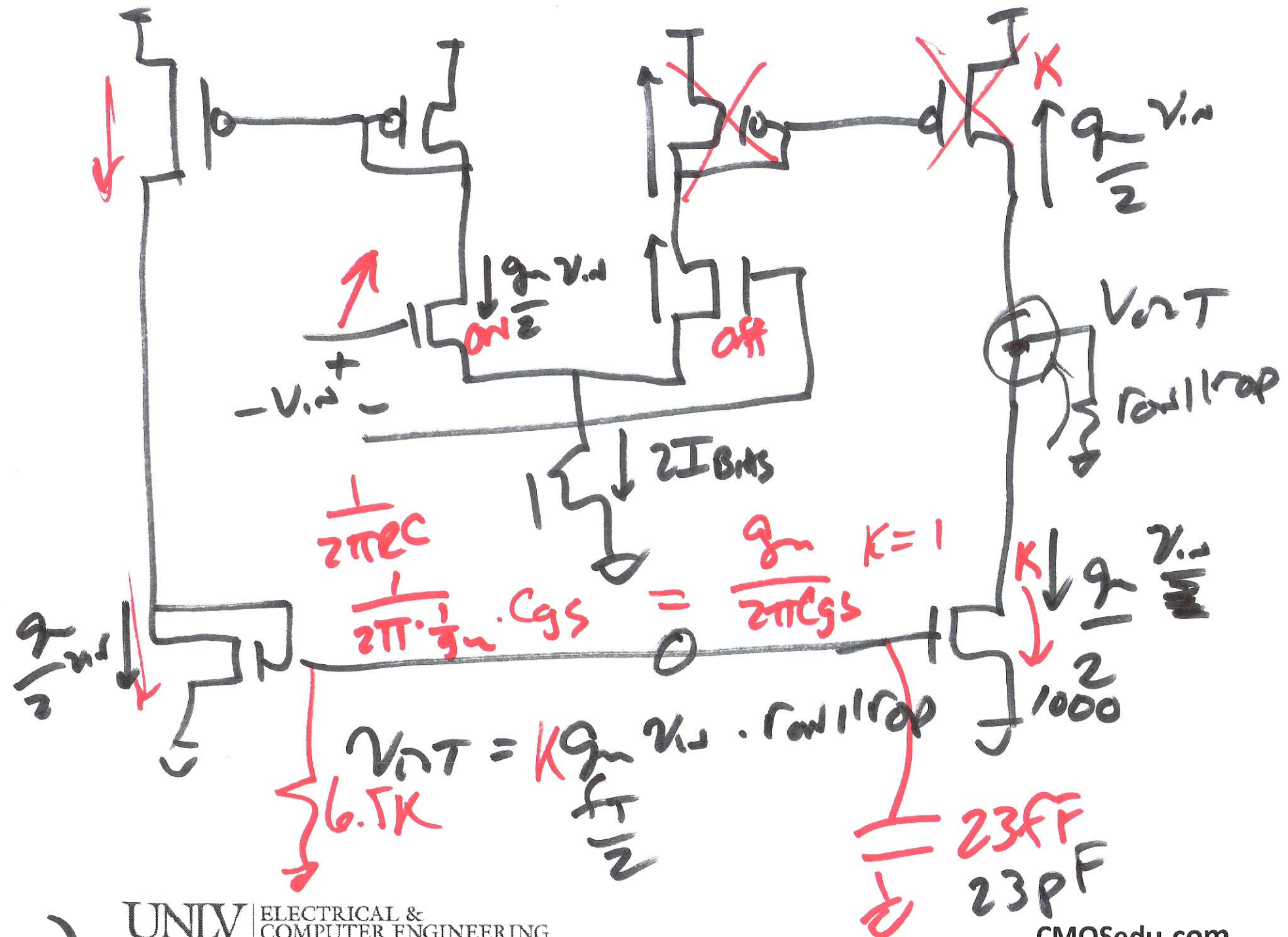


$$A_{OL} = g_{m1} (r_{on} \parallel r_{op})^2 \cdot g_{m2}$$

$$R_{of} \approx \frac{1}{g_{m1} (r_{on} \parallel r_{op}) \cdot g_{m2} \cdot \frac{6.5k \cdot 6.5k}{2.2 \times 10^6}}$$

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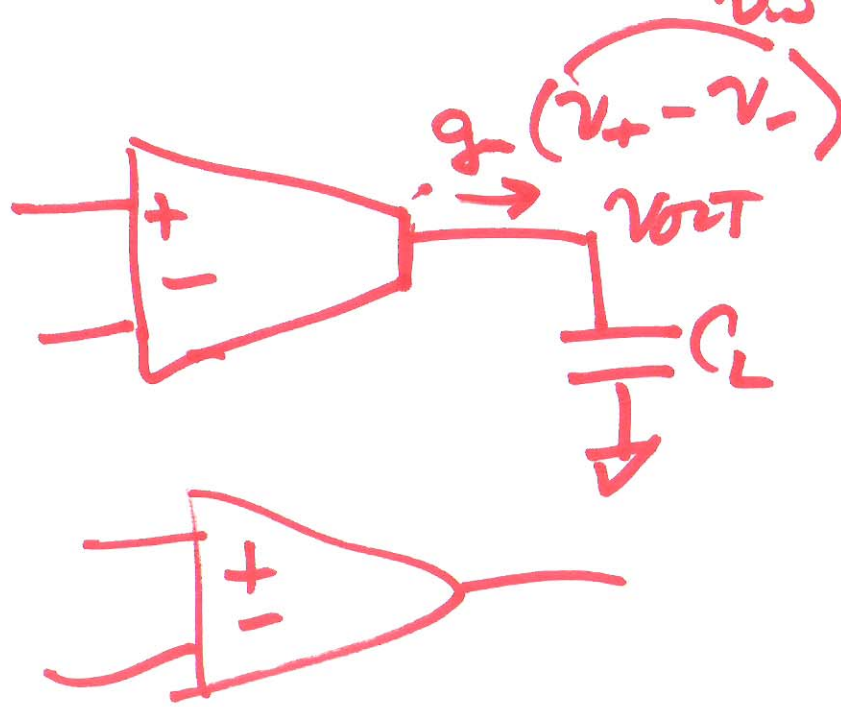
1)



2)

$$\frac{1}{\frac{1}{A_{OL}} + \beta} = A_{CL}$$

$$\frac{1}{\frac{1}{19} + 1} \cdot 95 = A_{CL}$$



~~$$v_{out} = A_{CL} v_{in}$$~~

$$v_{out} = \frac{v_{in}}{j\omega C_L}$$

$$f_{bw} = \frac{g_m}{2\pi \cdot C_L}$$

$$1 = \left| \frac{v_{out}}{v_{in}} \right| = \frac{g_m}{j\omega C_L} = \frac{1}{j2\pi f \cdot \frac{1}{g_m} C_L}$$