

EE204 Autumn 2023

Tutorial 6

Date 4 Oct 2023

Q1)

- Find the Voltage Transfer Characteristics (VTC) of the circuit of Fig. 1.
- Assume $V_{D(on)} = 0.7 \text{ V}$, Calculate all node voltages for $v_I = +1 \text{ V}$ and $v_I = -3 \text{ V}$.
- Suitably modify the circuit so that it accepts two inputs v_1 and v_2 , and gives $v_O = |v_1 + v_2|$.

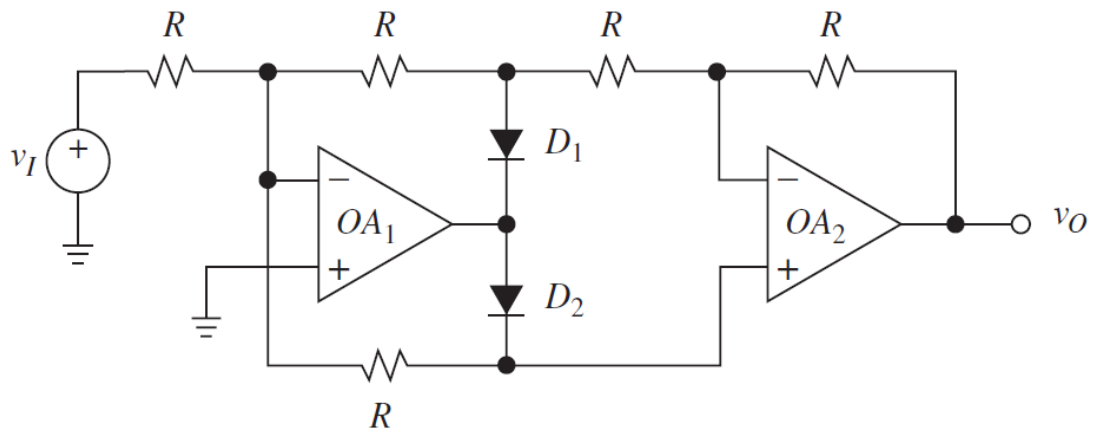


Figure 1

Q2) Assuming $V_{D(on)} = 0.7 \text{ V}$ and $\pm V_{sat} = \pm 4.5 \text{ V}$, sketch and label the VTC of the inverting Schmitt trigger shown in Fig. 2.

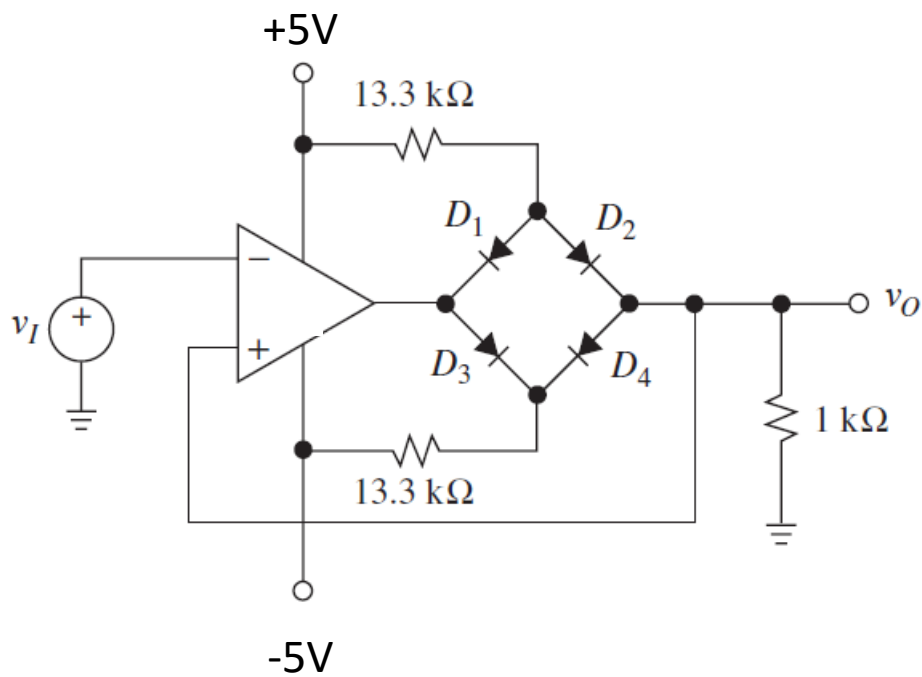


Figure 2

Q3) Assuming $R_1 = R_2 = R_4 = 10\text{ k}\Omega$ and $R_3 = 20\text{ k}\Omega$ in the FWR of Fig. 3, find all node voltages for $v_I = 10\text{ mV}$, 1 V , and -1 V . For a forward-biased diode, assume

$$v_D = (26\text{ mV}) \ln\left[\frac{i_D}{20\text{ fA}}\right].$$

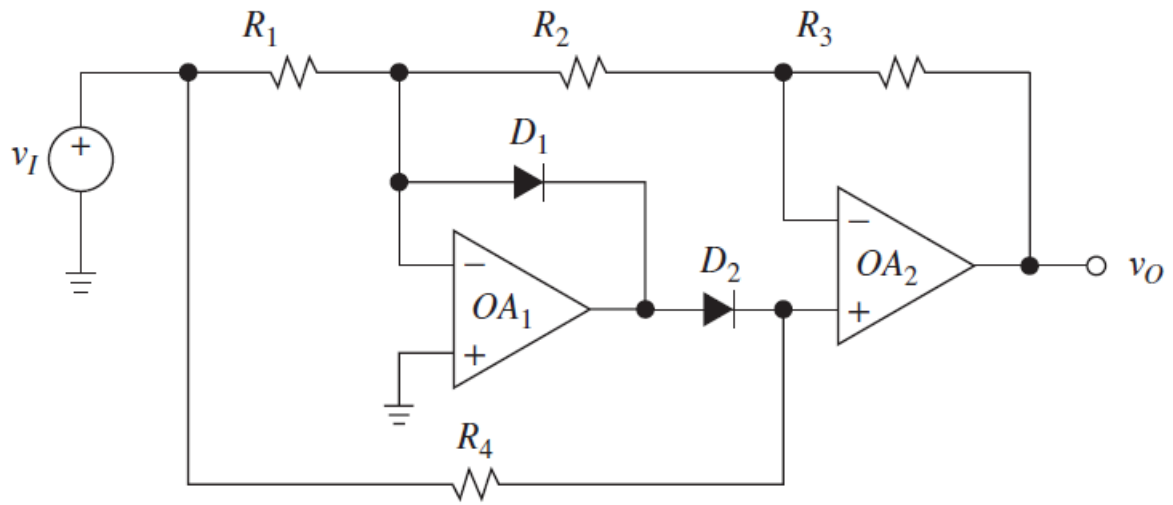


Figure 3