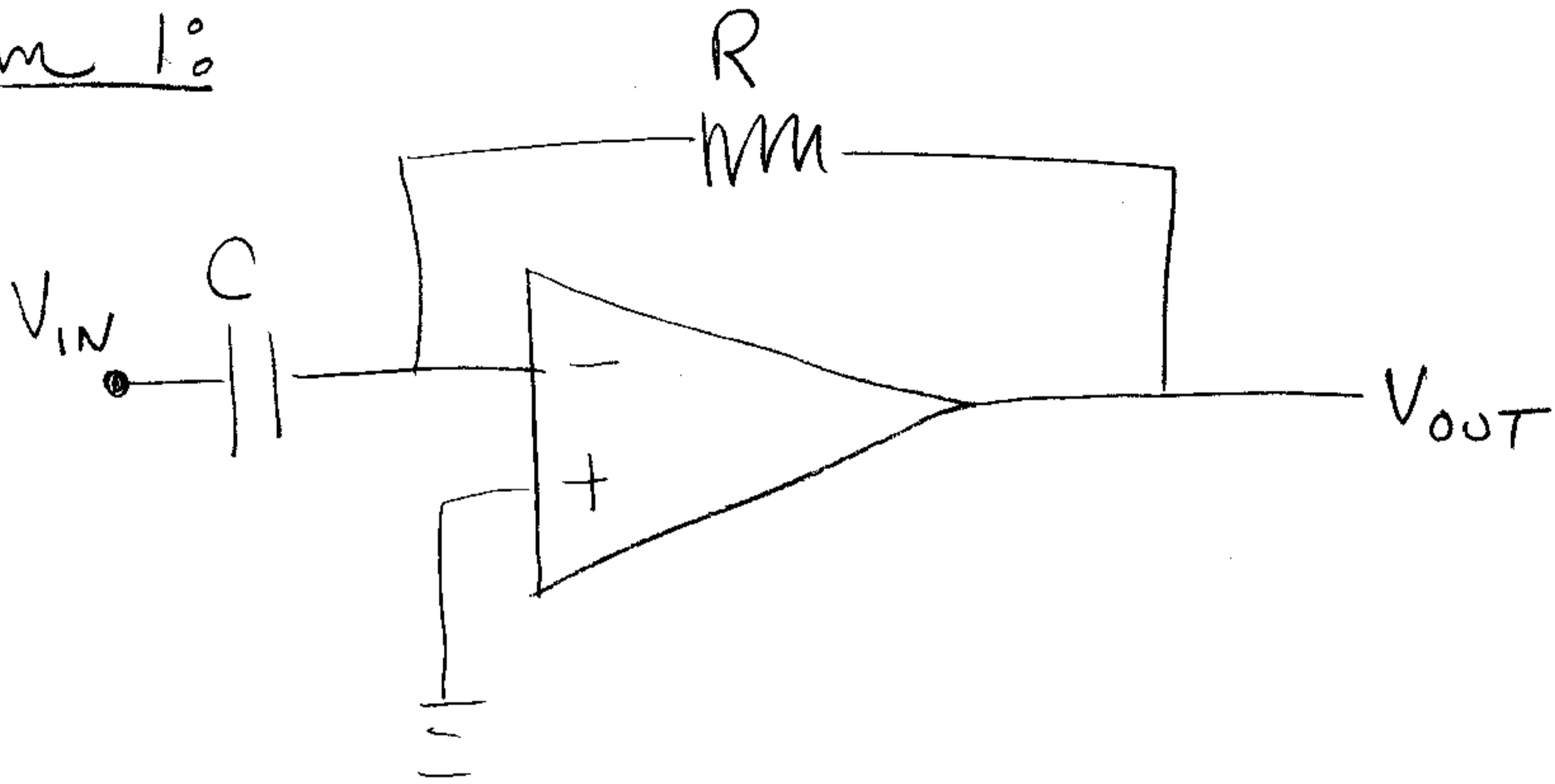


EE 42

"Hard" MT 2 Review Probs

Problem 1:



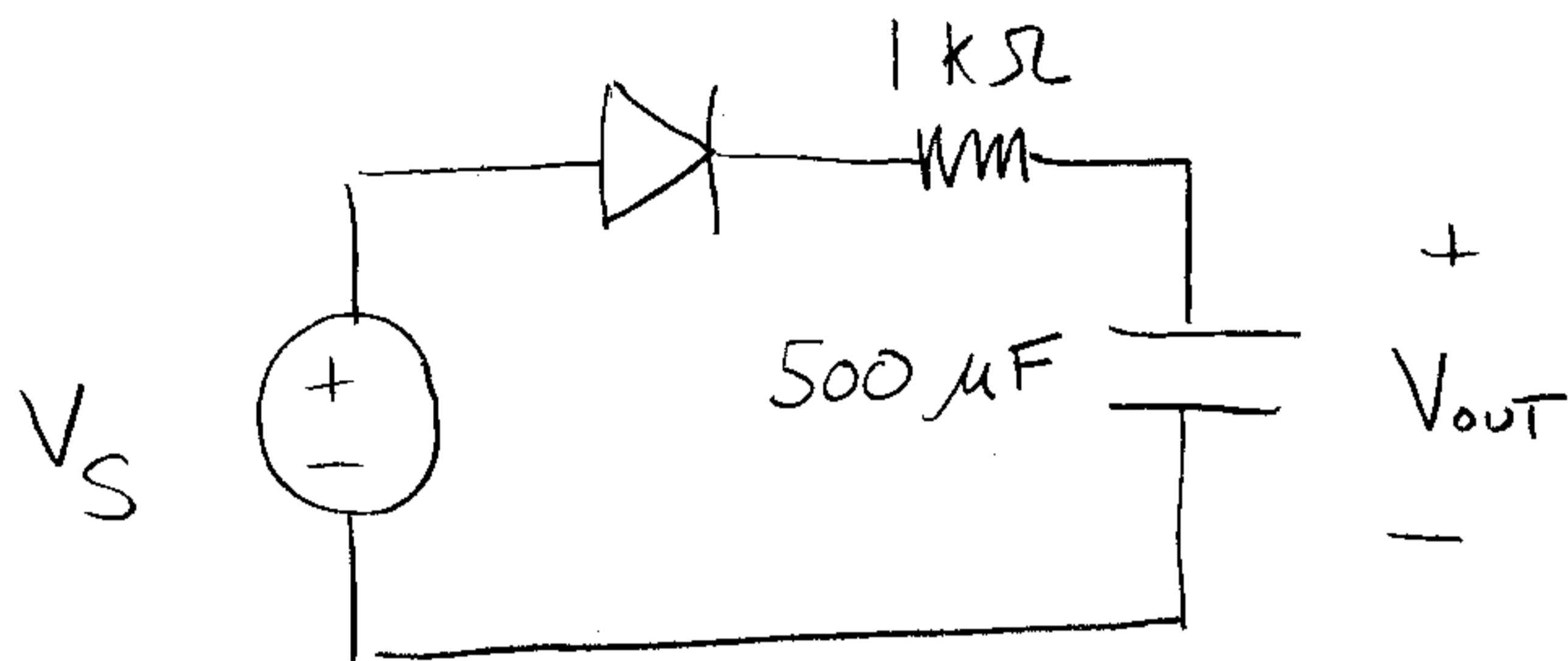
a) Find V_{OUT} in terms of V_{IN} , R , and C .

b) Suppose $V_{IN} = \sin(120\pi t) + 10^{-3} \sin(120 \times 10^6 \pi t)$

(V_{IN} is a 1 V, 60 Hz signal corrupted by 1 mV V of 60 MHz noise).

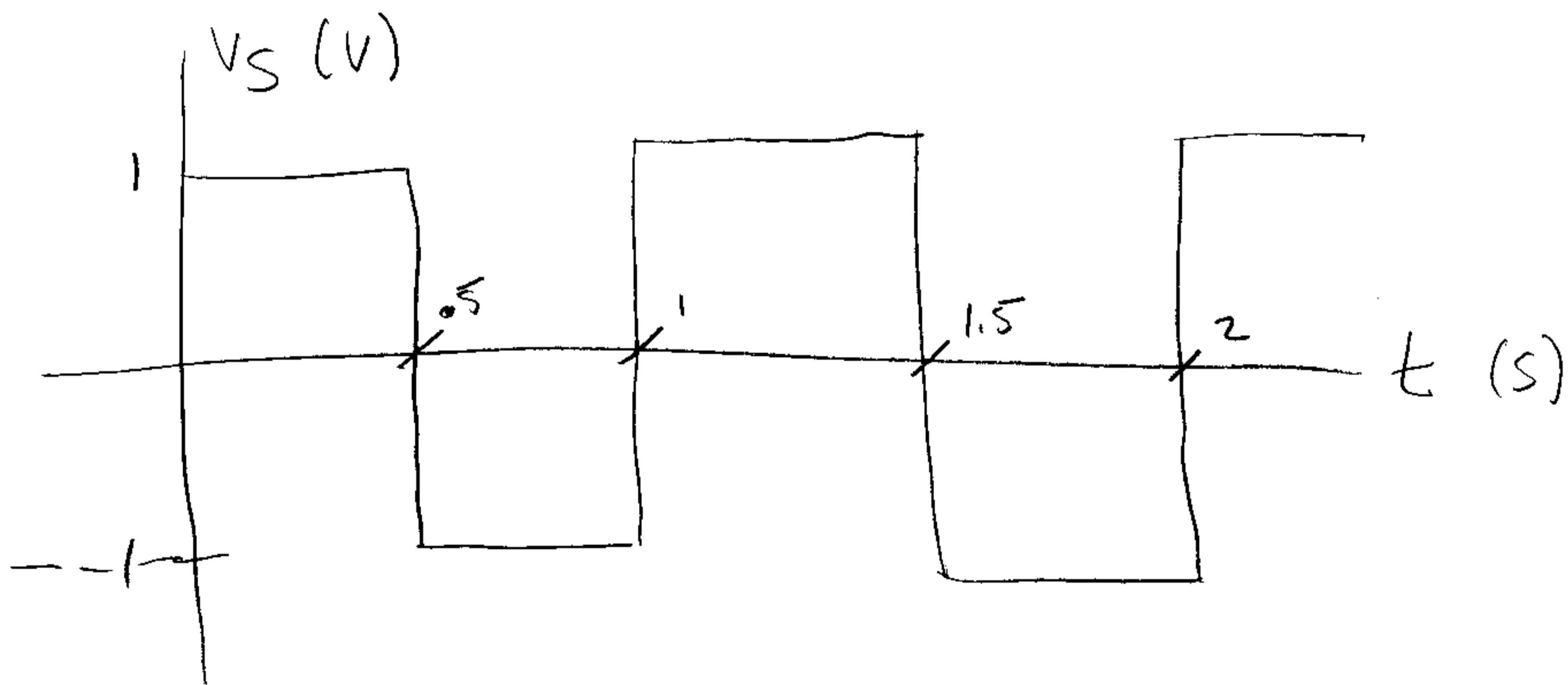
Graph V_{IN} and V_{OUT} .

Problem 2:



V_S is a 1 V amplitude, 1 Hz square wave with duty cycle 50%, 0 V offset.

this means

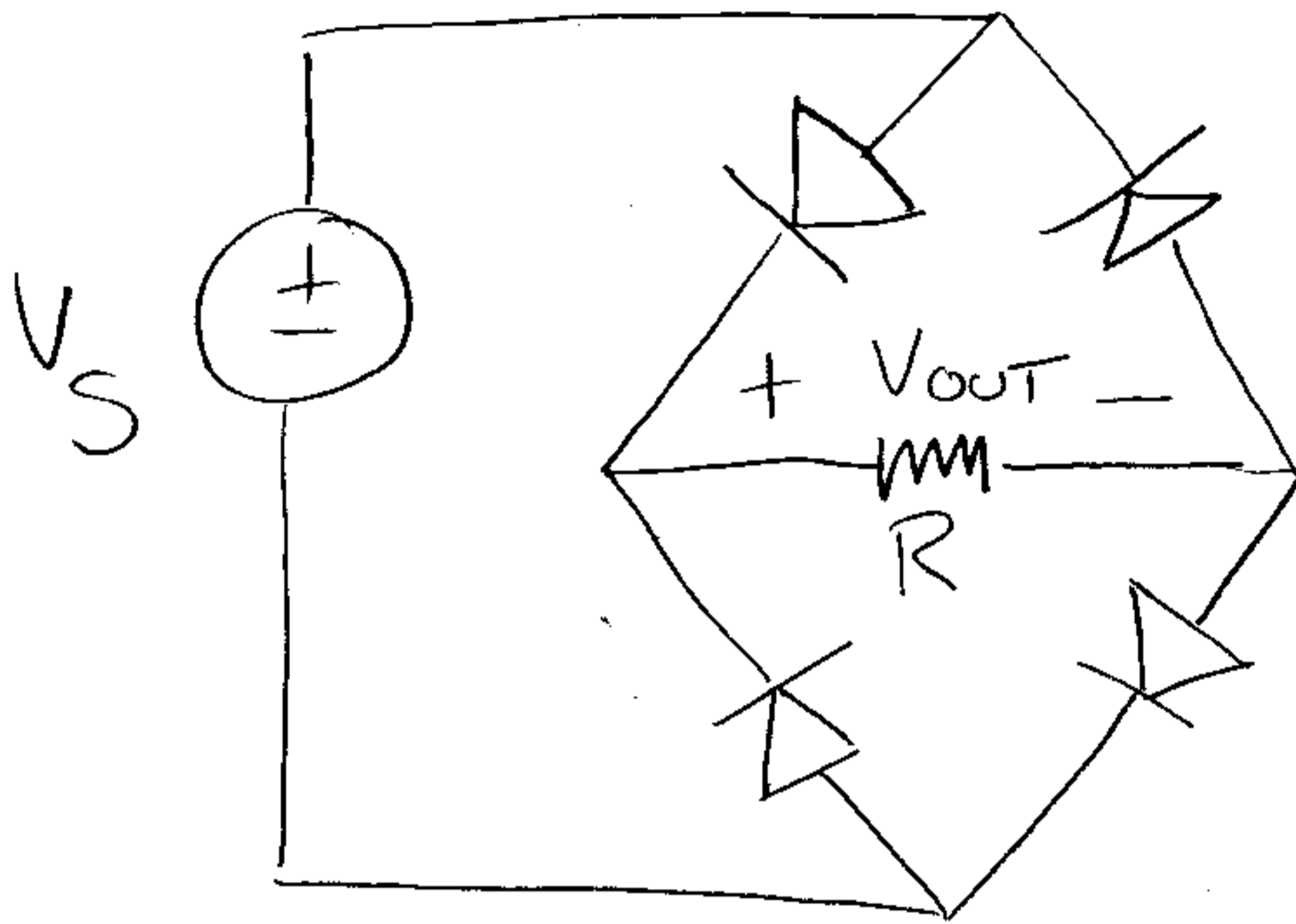


Sketch $V_{OUT}(t)$.

Assume the ideal diode model.

(How would V_{OUT} change for other models?)

Problem 3:

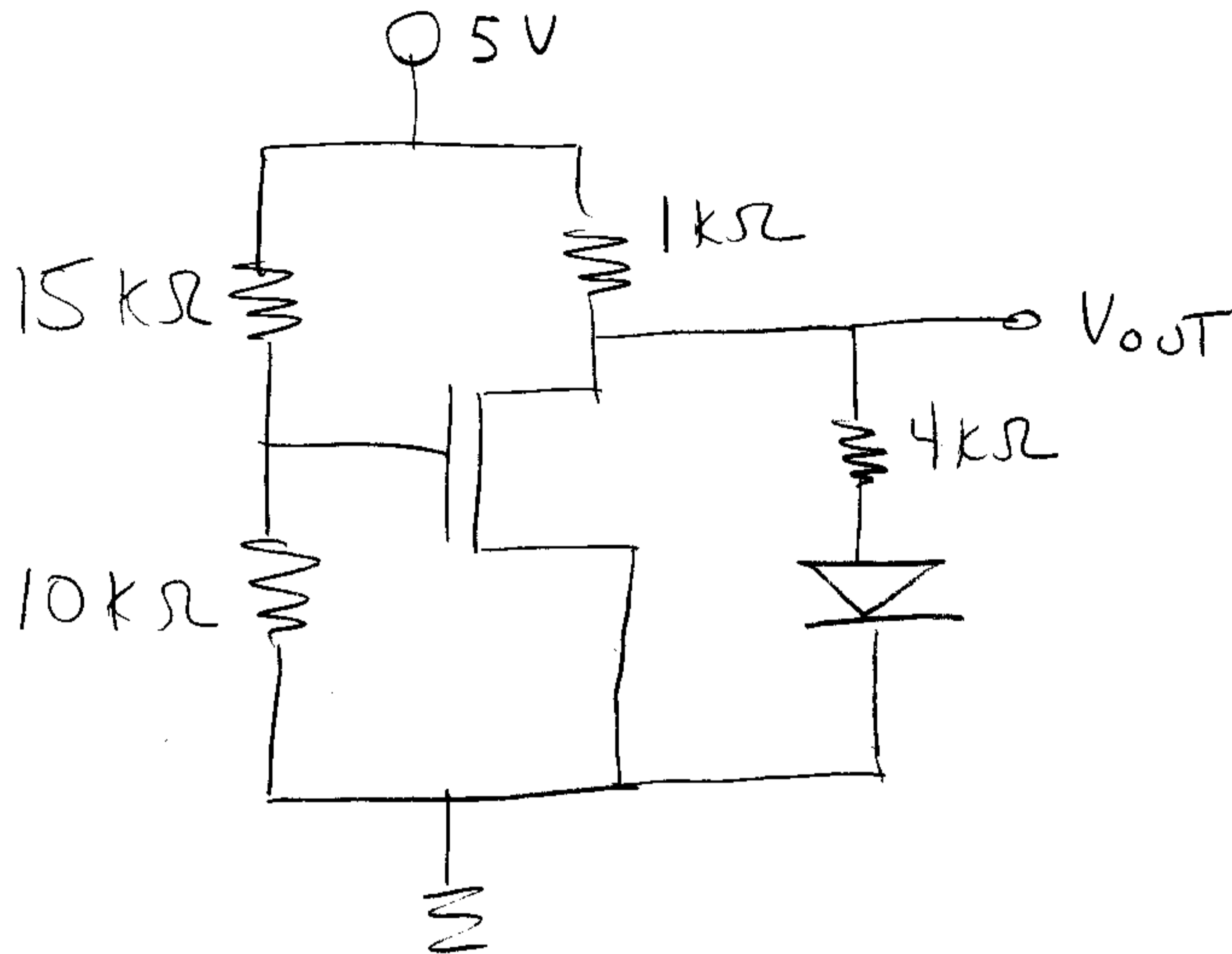


Suppose $V_S = \sin t$. Sketch $V_{OUT}(t)$.

Assume the ideal diode model.

(What would happen with the other model(s?)

Problem 4:



$$V_{TH(N)} = 1V$$

$$\mu_n C_{ox} = 1 \text{ mA/V}^2$$

$$\lambda_n = 0 \text{ V}^{-1}$$

$$V_F = 2V \quad (\text{use large-signal model for diode})$$

Find V_{OUT} .