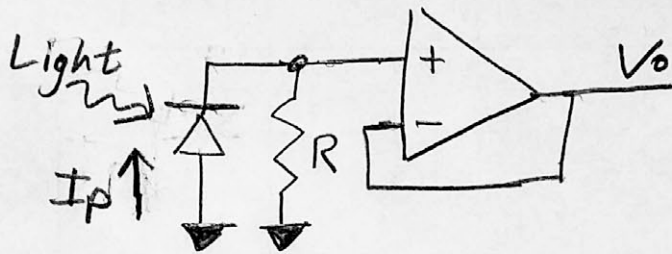


(1) A photodiode is connected to a load resistor  $R$  and the potential drop is sensed by a unity-gain buffer.

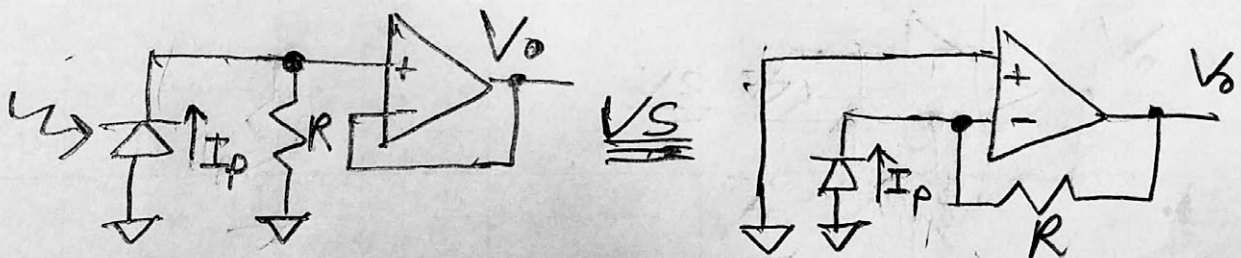


(A) What is  $V_o$  for a photo current  $I_p$ , as modeled?

Make a noise model of photodiode (shot noise) and a noise model for the resistor (Johnson noise).

(B) What is the RMS noise output? (C) What is the noise output in the limit that  $I_p \gg \frac{kT}{eR}$ ? (D)

Which circuit provides a more accurate means to measure  $I_p$ ?



(E) Why? (Hint: Think of large currents)