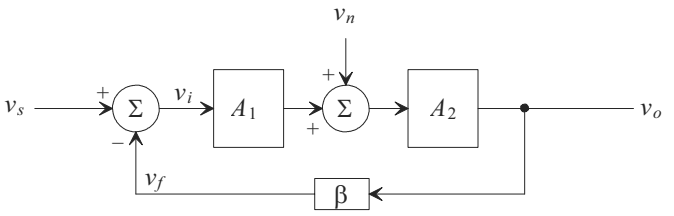

Figure 31.54 Problem 31.3, noise injected into a feedback system.

31.5 An amplifier can be characterized as follows:

$$A(s) = 1,000 \cdot \frac{s}{s+100} \text{ V/V}$$

and is connected in a feedback loop with a variable β. Determine the value of β for which the low-frequency rolloff is 50 rad/sec. What is the value of the closed-loop gain at that point?

31.6 Make a table summarizing the four feedback topologies according to the following categories: input variable, output variable, units of A_{OL}, units of β, method to calculate $R_{\beta i}$ and $R_{\beta o}$, and expressions for A_{CL}, R_{if}, and R_{of}.

31.7 Using the two n-channel common source amplifiers shown in Fig. 31.55a and the addition of a single resistor, draw (a) a series-shunt feedback amplifier, (b) a series-series feedback amplifier, (c) a shunt-shunt feedback amplifier, and (d) a shunt-series amplifier. For each case, identify the forward and feedback paths, ensure that the feedback is negative by counting the inversions around the loop, and label the input variable, the feedback variable, and the output variable. Assume that the input voltage has a DC component that biases M1.

31.8 Repeat problem 31.7 using the two-transistor circuit shown in Fig. 31.55b.

31.9 Repeat problem 31.7 using Fig. 31.55c.

31.10 Repeat problem 31.7 using Fig. 31.55d.

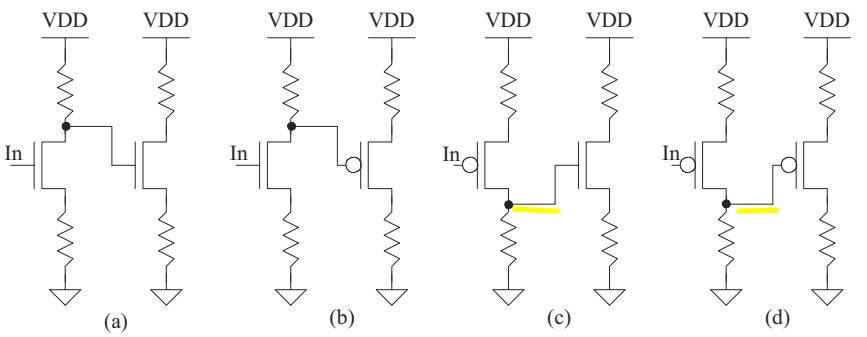

Figure 31.55 Two-transistor feedback topologies.