

**Problem 13** (round-off effects in digital filters)

Determine the variance of the round-off noise at the output of the two cascade realizations of the filter with system function

$$H(z) = H_1(z) \cdot H_2(z) \tag{1}$$

$$H_1(z) = \frac{1}{1 - 0,5z^{-1}}, H_2(z) = \frac{1}{1 - 0,25z^{-1}} \tag{2}$$

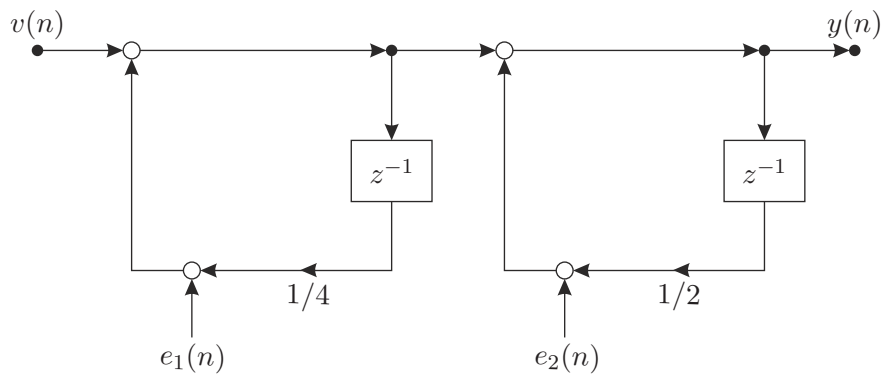
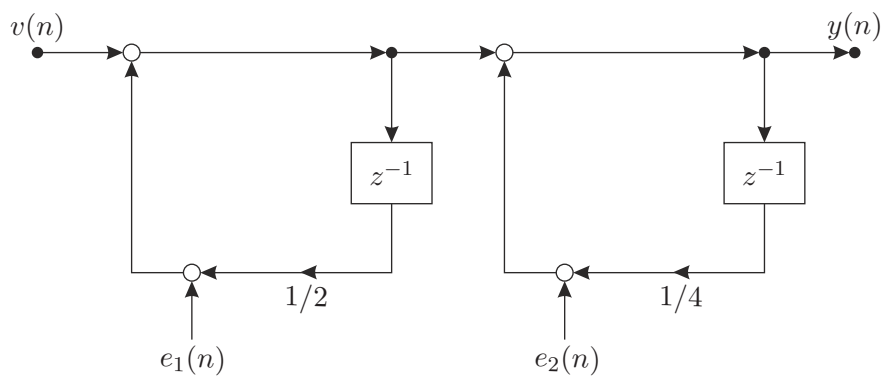


Figure 1: Two cascaded realizations of filters  $H_1(z)$  and  $H_2(z)$ .