

**Concept Question 3-11:** Why doesn't a strictly proper transfer function have a BIBO stable and causal inverse system?

If  $\mathbf{H}(s)$  is strictly proper, then the numerator polynomial of  $\mathbf{H}(s)$  has smaller degree than the degree of the denominator polynomial. Then the transfer function of the inverse system  $\mathbf{G}(s) = 1/\mathbf{H}(s)$  is strictly improper, and must be unstable (see Concept Question 3-10).