

**Concept Question 2-13:** What kind of function is  $\mathbf{H}(\omega)$  for a system described by an LCCDE?

$\mathbf{H}(\omega)$  is a rational function (ratio of two polynomials), as given by Eq. (2.114):

$$\mathbf{H}(\omega) = \frac{\sum_{i=0}^m b_{m-i} (j\omega)^i}{\sum_{i=0}^n a_{n-i} (j\omega)^i} .$$