

**Concept Question 3-6:** What purpose does the partial fraction expansion method serve?

The partial fraction expansion of the transfer function is a sum of terms of the forms  $\mathbf{C}_i / (\mathbf{s} - \mathbf{p}_i)$  where  $\mathbf{p}_i$  are its poles and  $\mathbf{C}_i$  are its residues. The inverse Laplace transform of the transfer function, which is the impulse response, is then a sum of terms  $\mathbf{C}_i e^{\mathbf{p}_i t} u(t)$ .