

Concept Question 6-16: Why do the impulse responses of the notch and comb filters include impulses, but the impulse response of the resonator filter does not?

The notch filter transfer function (with poles) is proper, and the comb filter transfer function is the product of notch filter transfer functions, so it is also proper. The resonator filter transfer function has no zeros, so it is strictly proper. The inverse Laplace transform of a proper function includes an impulse (see Section 3-5.1).