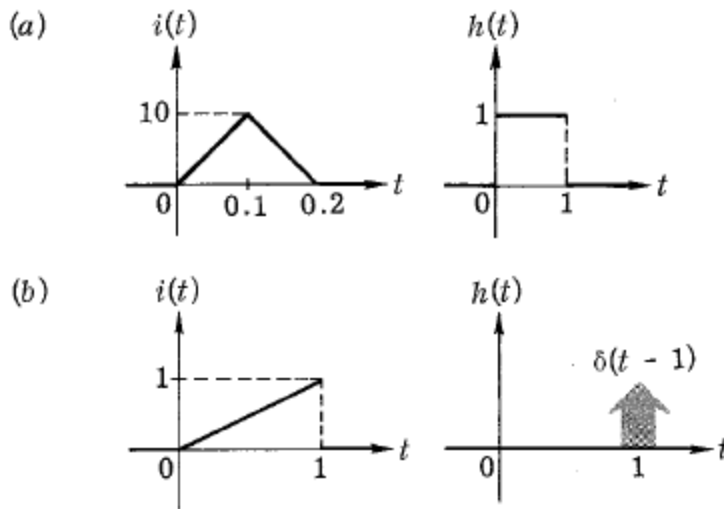


Zero-state
response

13. Sketch accurately the zero-state response for the following cases without using convolution integrals (see Fig. P6.13); h denotes the impulse response of the linear time-invariant circuit under consideration; i denotes the input.



تمرین کامپیوتری: با استفاده از متلب 13(a) را انجام دهید.

Convolution
integral

14. Repeat Prob. 13 by the use of the convolution integral.

Time-varying
circuit

18. For a linear time-varying circuit, if the response at time t for a unit impulse applied at time τ is

$$h(t, \tau) = t - \tau^2$$

Calculate, by using convolution, the response for an input

$$i_s(t) = tu(t) + 2u(t) - \delta(t)$$

Impulse
response,
complete
response, and
convolution

22. Consider the linear time-invariant series RLC circuit with input e_s and response i , as shown in Fig. P6.22a.

a. Calculate and sketch the impulse response.

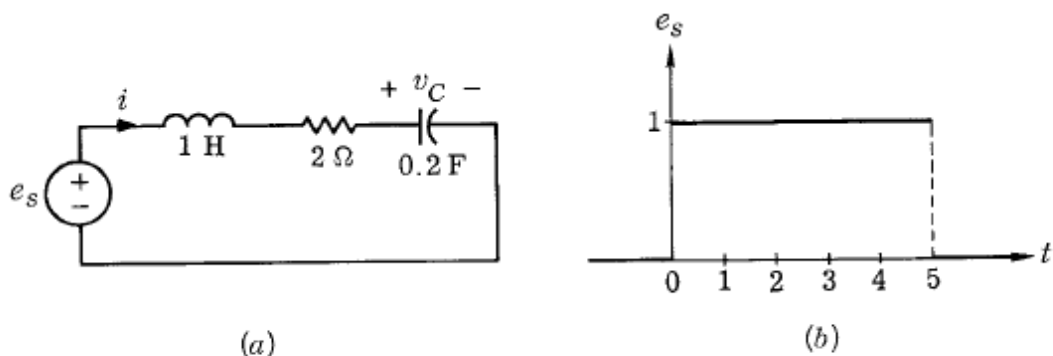


Fig. P6.22

- b. Write down an expression that would permit you to calculate the complete response for any given input voltage e_s applied at $t = 0$, and for any initial state $i_L(0) = I_0$ and $v_C(0) = V_0$.
- c. Calculate and sketch the complete response for $I_0 = 1$ amp, $V_0 = -1$ volt, and e_s as shown in Fig. P6.22b.

تمرین کامپیوتری: با استفاده از اسپایس 22(c) را انجام دهید.