

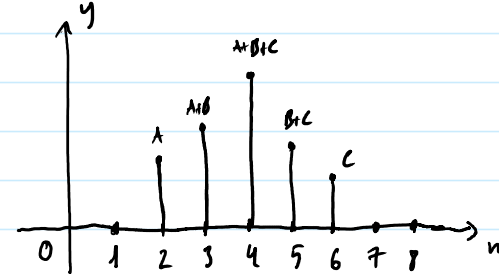
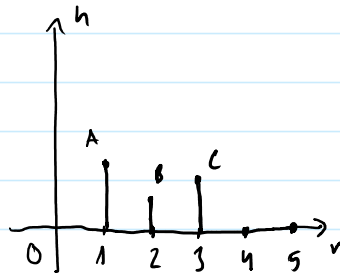
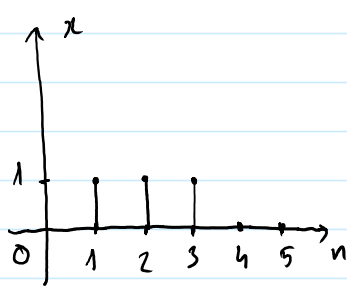
Homework 2

17 December 2022 17:04

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2.1)



$$x[n] = \begin{cases} n & n = 1, 2, 3 \\ 0 & \text{otherwise} \end{cases}; \quad h[n] = \begin{cases} A & n = 1 \\ B & n = 2 \\ C & n = 3 \\ 0 & \text{otherwise} \end{cases}$$

$$y[n] = \sum_{k=-\infty}^{+\infty} x[k] h[n-k]$$

$$y[n] = 0 \quad \forall n \leq 1 \text{ or } n \geq 7$$

$$y[2] = x[1] h[1] = A$$

$$y[3] = x[1] h[2] + x[2] h[1] = B + A$$

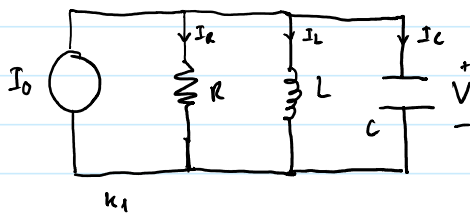
$$y[4] = x[1] h[3] + x[2] h[2] + x[3] h[1] = C + B + A$$

$$y[5] = x[2] h[3] + x[3] h[2] = C + B$$

$$y[6] = x[3] h[3] = C$$

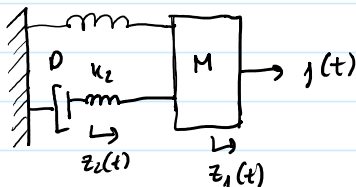
2.2)

a)



$$I_0 = I_R + I_L + I_C \\ = \frac{V}{R} + \frac{1}{L} \int V dt + C \cdot \frac{dV}{dt}$$

b)



$$Ma = f(t) - k_1 z_1(t) - k_2 z_2(t) - D \frac{d(z_1(t) - z_2(t))}{dt}$$