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$$\begin{aligned} G(s) &= C(sI-A)^{-1}B+D \\ &= [1 \ 0] \left\{ \begin{bmatrix} s & 0 \\ 0 & s \end{bmatrix} - \begin{bmatrix} 0 & 1 \\ k & -\frac{b}{m} \end{bmatrix} \right\}^{-1} \begin{bmatrix} 0 \\ \frac{1}{m} \end{bmatrix} + 0 \\ &= [1 \ 0] \begin{bmatrix} s & -1 \\ \frac{k}{m} & s + \frac{b}{m} \end{bmatrix}^{-1} \begin{bmatrix} 0 \\ \frac{1}{m} \end{bmatrix} \end{aligned}$$

$$\begin{bmatrix} s & -1 \\ \frac{k}{m} & s + \frac{b}{m} \end{bmatrix}^{-1} = \frac{1}{s^2 + \frac{b}{m}s + \frac{k}{m}} \begin{bmatrix} s + \frac{b}{m} & 1 \\ -\frac{k}{m} & s \end{bmatrix}$$

$$\begin{aligned} G(s) &= [1 \ 0] \frac{1}{s^2 + \frac{b}{m}s + \frac{k}{m}} \begin{bmatrix} s + \frac{b}{m} & 1 \\ -\frac{k}{m} & s \end{bmatrix} \begin{bmatrix} 0 \\ \frac{1}{m} \end{bmatrix} \\ &= \frac{1}{ms^2 + bs + k} \end{aligned}$$

$$Y = \begin{bmatrix} y_1 \\ y_2 \\ y_m \end{bmatrix}, \quad U = \begin{bmatrix} u_1 \\ u_2 \\ u_n \end{bmatrix}$$

$$Y(s) = G(s)U(s) \\ \begin{bmatrix} y_1 \\ y_2 \\ y_m \end{bmatrix} = \frac{1}{ms^2 + bs + k} \begin{bmatrix} u_1 \\ u_2 \\ u_n \end{bmatrix}$$

$$\begin{bmatrix} y_1 \\ y_2 \\ y_m \end{bmatrix} = \begin{bmatrix} ms^2 + bs + k \\ ms^2 + bs + k \\ ms^2 + bs + k \end{bmatrix}$$

$$G(s) = C(sI-A)^{-1}B+D$$

$$\frac{Y(s)}{U(s)} = \begin{bmatrix} 0 & 1 & 0 \\ 5 & 0 & 0 \\ 0 & 0 & 5 \end{bmatrix} \cdot \begin{bmatrix} -14 & -56 & -160 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}^{-1} \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix} + 0$$

$$\frac{Y(s)}{U(s)} = [0 \ 1 \ 0] \begin{bmatrix} s+14 & 56 & 160 \\ 1 & 0 & 0 \\ 0 & 1 & 5 \end{bmatrix}^{-1} \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} + 0$$

$$\frac{Y(s)}{U(s)} = [0 \ 1 \ 0] \frac{1}{(s^3 + 14s^2 - 60s) - (56s)} \begin{bmatrix} s^3 + 14s - 56 \\ -56s - 160 \\ -160s \end{bmatrix} \begin{bmatrix} -1-s \\ s+4 \\ s^2 + 14s - 56 \end{bmatrix} \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} + 0$$

$$\frac{Y(s)}{U(s)} = [0 \ 1 \ 0] \begin{bmatrix} s^3 + 14s - 56 \\ s^3 + 14s^2 - 56s - 160 \\ -56s - 160 \\ s^3 + 14s^2 - 56s - 160 \\ -160s \\ s^3 + 14s^2 - 56s - 160 \end{bmatrix}$$

$$G(s) = \frac{-56s - 160}{s^3 + 14s^2 - 56s - 160}$$