

Selesaikan persamaan 2 untuk  $X_2(s)$  dan substitusikan ke dalam persamaan 1.

$$[m_1 s^2 + bs + (k_1 + k_2)] X_1(s) = (bs + k_2) X_2(s) + U(s) \quad \dots (1)$$

$$[m_2 s^2 + bs + (k_2 + k_3)] X_2(s) = (bs + k_2) X_1(s) \quad \dots (2)$$

$$\Rightarrow X_2(s) = \frac{(bs + k_2) X_1(s)}{[m_2 s^2 + bs + (k_2 + k_3)]}$$

$$\Rightarrow [m_1 s^2 + bs + (k_1 + k_2)] X_1(s) = \frac{(bs + k_2)(bs + k_2) X_1(s) + U(s)}{m_2 s^2 + bs + (k_2 + k_3)}$$

$$[m_1 s^2 + bs + (k_1 + k_2)] X_1(s) = \frac{(bs + k_2)^2 X_1(s)}{m_2 s^2 + bs + (k_2 + k_3)} + U(s)$$

$$\Rightarrow [(m_1 s^2 + bs + (k_1 + k_2))(m_2 s^2 + bs + (k_2 + k_3))] X_1(s) = (bs + k_2)^2 X_1(s) + U(s) (m_2 s^2 + bs + (k_2 + k_3))$$

$$\Rightarrow [(m_1 s^2 + bs + (k_1 + k_2))(m_2 s^2 + bs + (k_2 + k_3)) - (bs + k_2)^2] X_1(s) = (m_2 s^2 + bs + (k_2 + k_3)) U(s)$$

$$\frac{X_1(s)}{U(s)} = \frac{m_2 s^2 + bs + k_2 + k_3}{(m_1 s^2 + bs + k_1 + k_2)(m_2 s^2 + bs + k_2 + k_3) - (bs + k_2)^2}$$

untuk persamaan  $\frac{X_2(s)}{U(s)}$  digunakan persamaan 1 & 2 diatas dengan metode substitusi, maka didapatkan

$$\frac{X_2(s)}{U(s)} = \frac{bs + k_2}{(m_1 s^2 + bs + k_1 + k_2)(m_2 s^2 + bs + k_2 + k_3) - (bs + k_2)^2}$$

Selesaikan persamaan 2 untuk  $X_2(s)$  dan substitusikan ke dalam persamaan 1.

$$[m_1 s^2 + bs + (k_1 + k_2)] X_1(s) = (bs + k_2) X_2(s) + U(s) \quad \dots (1)$$

$$[m_2 s^2 + bs + (k_2 + k_3)] X_2(s) = (bs + k_2) X_1(s) \quad \dots (2)$$

$$\Rightarrow X_2(s) = \frac{(bs + k_2) X_1(s)}{[m_2 s^2 + bs + (k_2 + k_3)]}$$

$$\Rightarrow [m_1 s^2 + bs + (k_1 + k_2)] X_1(s) = \frac{(bs + k_2)(bs + k_2) X_1(s) + U(s)}{m_2 s^2 + bs + (k_2 + k_3)}$$

$$[m_1 s^2 + bs + (k_1 + k_2)] X_1(s) = \frac{(bs + k_2)^2 X_1(s)}{m_2 s^2 + bs + (k_2 + k_3)} + U(s)$$

$$\times m_2 s^2 + bs + (k_2 + k_3)$$

$$\Rightarrow [(m_1 s^2 + bs + (k_1 + k_2))(m_2 s^2 + bs + (k_2 + k_3))] X_1(s) = (bs + k_2)^2 X_1(s) + U(s)(m_2 s^2 + bs + (k_2 + k_3))$$

$$\Rightarrow [(m_1 s^2 + bs + (k_1 + k_2))(m_2 s^2 + bs + (k_2 + k_3)) - (bs + k_2)^2] X_1(s) = (m_2 s^2 + bs + (k_2 + k_3)) U(s)$$

$$\frac{X_1(s)}{U(s)} = \frac{m_2 s^2 + bs + k_2 + k_3}{(m_1 s^2 + bs + k_1 + k_2)(m_2 s^2 + bs + k_2 + k_3) - (bs + k_2)^2}$$

untuk persamaan  $\frac{X_2(s)}{U(s)}$  digunakan persamaan 1 & 2 diatas dengan metode substitusi, maka didapatkan

$$\frac{X_2(s)}{U(s)} = \frac{bs + k_2}{(m_1 s^2 + bs + k_1 + k_2)(m_2 s^2 + bs + k_2 + k_3) - (bs + k_2)^2}$$