ITESO

Universidad Jesuita
de Guadalajara

Sistema de Control Automatico.

TPE 1.2

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TP E 1.2

$$\frac{Y(s)}{U(s)} = \frac{\frac{4}{5}s^3 - \frac{3}{5}}{s^3 + \frac{4}{5}s^2 + \frac{2}{5}s + \frac{8}{25}} \qquad m = 3 \quad n = 3$$

cond $m = n$

$$s^3 + \frac{4}{5}s^2 + \frac{2}{5}s + \frac{8}{25} \;\Big|\; \frac{4}{5}s^3 - \frac{3}{5}$$

$$-\frac{4}{5}s^3 - \frac{16}{25}s^2 - \frac{8}{25}s - \frac{32}{25}$$

$$-\frac{16}{25}s^2 - \frac{8}{25}s - \frac{47}{25}$$

$$\frac{Y(s)}{U(s)} = \frac{4}{5} - \frac{\frac{16}{25}s^2 + \frac{8}{25}s + \frac{47}{25}}{s^3 + \frac{4}{5}s^2 + \frac{2}{5}s + \frac{8}{25}} \qquad m = 2 \quad n = 3 \quad n > m \checkmark$$

$$= \qquad a_0 = \frac{8}{25} \quad a_1 = \frac{2}{5} \quad a_2 = \frac{4}{5} \qquad D = \frac{4}{5}$$

$$b_0 = \frac{47}{25} \quad b_1 = \frac{8}{25} \quad b_2 = \frac{16}{25}$$

$$\dot{x}(t) = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -\frac{8}{25} & -\frac{2}{5} & -\frac{4}{5} \end{bmatrix} x(t) + \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} u(t)$$

$$y(t) = \left[-\frac{47}{25} \quad -\frac{8}{25} \quad -\frac{16}{25}\right] x(t) + \frac{4}{5}u(t)$$