Assignment 1

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State space;

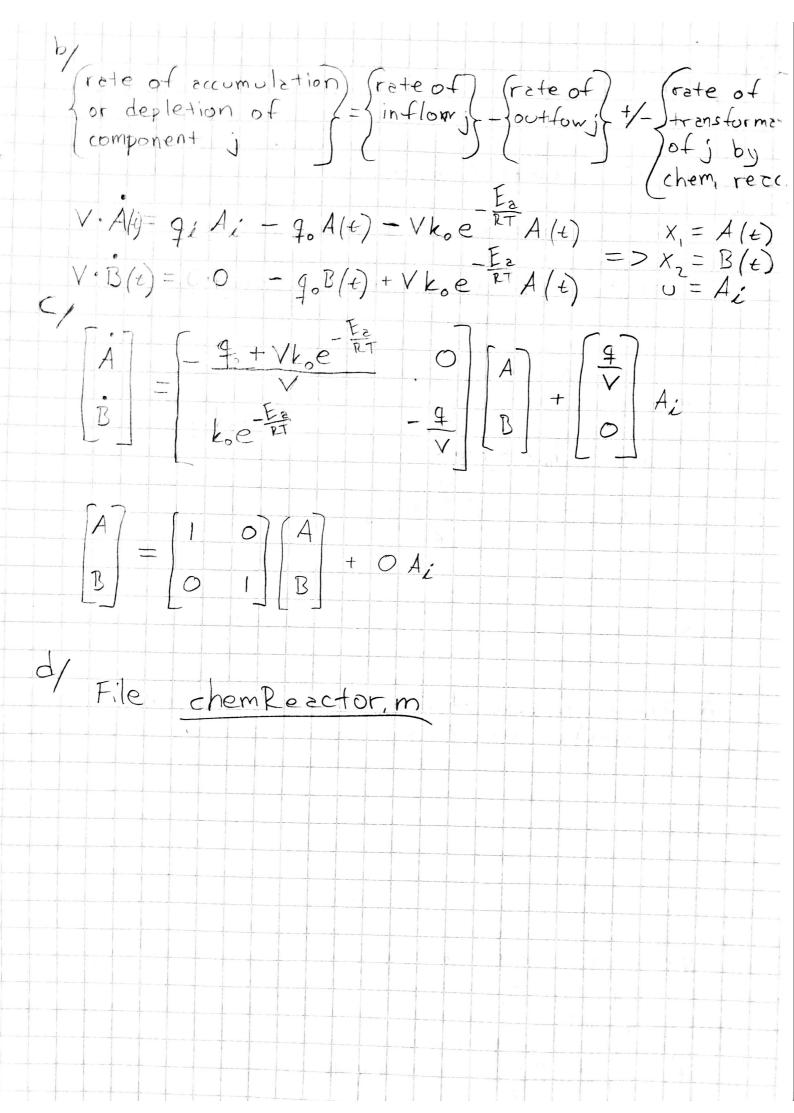
$$\begin{bmatrix} \dot{4} \\ \dot{2} \\ \dot{3} \end{bmatrix} = \begin{bmatrix} -18, 2 & -5, 1 \\ 0, 3 & 0 \end{bmatrix} \begin{bmatrix} 4 \\ 1 \\ 0, 3 \end{bmatrix} + \begin{bmatrix} 435, 5 \\ -36, 7 \end{bmatrix}$$

$$y = \begin{bmatrix} -0,2 & 0 \end{bmatrix} \begin{bmatrix} 4 \\ v \end{bmatrix} + 0 u$$

$$7F = 6(s) = c(sI - A)^{-1}B + D$$

from metleb:
$$6(s) = \frac{-87,1s - 37,43}{s^2 + 18,2s + 1,53}$$

DITANK: constant volume homogeneous temp reactant concentration A(t) (mol/L) Product concentration B(t) (mol/L) inflow: reactant concentration A: (mol/L) i 9i (L/s) volumetric flow rate outflow: the tentre action that A(t) is transformed to product B(t) at rate: r=kA(t) - reaction rate r (mol/(s·L)) = Ea - rate constant (Arrhenius) k = k0e RT ARB? controlled by Ai Outputs: A(t) and B(t) in the outflow Inputs: concentration Ai in the inflow Constant: temp T, volume V, flow rates qi & qo Internal time varying: none



3) Outputs: distance z(t) Inputs: current i/t) Constant: mass m, acceleration g, inductance L Internal time varying, magnetic force Fm => $m\ddot{x}=F_m-mg$ $m\ddot{x} = -\frac{L}{2a}i^2e^{-\frac{2a}{a}} + ma$ $X = -\frac{L}{2am}i^{2}e^{2} + q$ Nonlinear because of the exponential function. State variables are & l'à

Equilibrium when
$$\ddot{x} = 0$$

$$g = \frac{L}{2am} \frac{1}{2}e^{-\frac{2}{2}}$$

$$\dot{L} = \int \frac{2amg}{Le^{-\frac{2}{2}}} = 1,4314$$

$$c_{1} = f(x, 0) + f(x_{0}, 0) + \frac{df}{dx} (x_{0}, 0) + \frac{df}{dx} ($$

f/ File MagLevit, m $\frac{-13,71}{5^2-7,105e^{-15}s-1473}$ h/ File Maglevit, m The system is not stable.