MECH 6300-HW 3

1)

$$A = \begin{bmatrix} 0 & 2 & 1 \\ 0 & -75 & -45 \\ 0 & 100 & 60 \end{bmatrix}$$

$$\Delta(s) = |sI - A| = \begin{vmatrix} s & -2 & -1 \\ 0 & s+75 & 45 \\ 0 & -100 & s-60 \end{vmatrix}$$

$$\Delta(s) = s^2(s+15)$$

$\lambda_1 = 0, m_1 = 2$

$\lambda_2 = -15$

$(A - \lambda_1 I) X_1 = 0$

$$X_1 = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$$

$$J = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & -15 \end{bmatrix}$$

$$\begin{matrix} 0 & 2b + c & = 0 \\ 0 & -75b - 45c & = 0 \\ 0 & 100b + 60c & = 0 \end{matrix}$$

$$\rho(A - \alpha I) = 2$$

$$Y = \begin{matrix} 1 & -1 \\ 0 & 3 \end{matrix}$$