

MECH 6300-HW 3

1)

a)

$$A = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 9 & 18 & 0 & -2 \end{bmatrix}$$

$$\chi(s) = s^4 + 2s^3 - 0s^2 - 18s - 9$$

$$\chi(s) = (s+1)^2(s-3)(s+3)$$

$$P(A+I) = 3 \begin{pmatrix} 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 1 \\ 9 & 18 & 0 & -1 \end{pmatrix}$$

$$\lambda_1 = -1$$

$$\lambda_2 = 3$$

$$\lambda_3 = -3$$

$m_1 = 2$

$$\gamma(A, \lambda, F) = 1$$

$$J = \begin{bmatrix} -1 & 1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 3 & 0 \\ 0 & 0 & 0 & -3 \end{bmatrix}$$