Final 2008 Solns

1) See Final 1999 solutions

2) See posted matlab and mathematica code.
For 1 term, $\omega_1 = 3.16$ rad/s
For 2 terms, $\omega_1 = 3.07$ rad/s, $\omega_2 = 9.99$ rad/s

3) $V = \begin{bmatrix} 0 \\ 0.924 \\ 0.383 \end{bmatrix}$, $P = \begin{bmatrix} 1 & 0 & 0 \\ 0 & -0.707 & -0.707 \\ 0 & -0.707 & 0.707 \end{bmatrix}$

Tridiagonalized matrix is $\begin{bmatrix} 2 & \sqrt{2} & 0 \\ \sqrt{2} & 5 & -4 \\ 0 & -4 & 11 \end{bmatrix}$

4) See exam 1, 2000