Due: March 1, 2016 Name _____

HOMEWORK SET # 4
ME/AE 6212 Advanced Finite Element Analysis

Write a computer program (MATLAB language or other programming languages like C, FORTRAN etc.) to solve the following two-variable second order system problem. (40 points)

$$[M]\{\ddot{u}\} + [C]\{\dot{u}\} + [K]\{u\} = \{F\}; \{u\}_{t_o} = \{\dot{u}\}_{t_o} = 0$$

where

$$[M] = \begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix}; [C] = [K] = \begin{bmatrix} 1 & 1 \\ 1 & 3 \end{bmatrix}; \{F\} = \begin{Bmatrix} 1 \\ 2 \end{Bmatrix}$$

Using Newmark's Integration Scheme, solve for u_1, u_2, $\dot{u}_1$, $\dot{u}_2$, $\ddot{u}_1$ and $\ddot{u}_2$ for $t = 15$ sec with $\Delta t = 0.5$ sec.

Need a summary of numerical results in both tabular and graphical form along with listing of code and sample output. The summary should follow the problem statement.

Note: This is a solved problem in the handout (Example 5.29, pp. 328-330, Dhatt and Touzot).