GEN 500
Engineering System Analysis
FALL 2020

HW #2
Due Date: 9/30/2020

Name: _____ Banner ID: _____

Problem #1

Given the two matrices $A = \begin{bmatrix} 1 & -2 & 3 \\ 0 & 1 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 3 & 4 & 3 \\ 2 & 0 & 1 \end{bmatrix}$, $C = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

Perform the following operations using MATLAB

I) A + B

II) B * C

Problem #2

What is displayed when the following MATLAB statements are executed?

(a) A = [1 2; 3 4; 5 6]; A(2,:)'
(b) y = [0:1.5:7]'
(c) a = 2; b = 8; c = 4; a + b / c

Problem #3

Use the linspace function to create vectors identical to the following created with colon notation:

(a) t = 4:6:34
(b) x = −4:3

Problem #4

The following equation can be used to compute values of *y* as a function of *x*:

$$y = be^{-ax}\sin(bx)\,(0.011x^4 - 0.14x^3 + 0.075x^2 + 3.5x)$$

where a and b are parameters. Write the equation for implementation with MATLAB, where $a = 2$, $b = 3.5$, and x is a vector holding values from 0 to $\pi/2$ in increments of $\Delta x = \pi/35$. Employ the minimum number of periods (i.e., dot notation) so that your formulation yields a vector for y. In addition, compute the vector $z = y^3$ where each element holds the square of each element of y. Combine x, y, and z into a matrix w, where each column holds one of the variables, and display w using the short g format. In addition, generate a labeled plot of y and z versus x. Include a legend on the plot (use help to understand how to do this). For y, use a 1.4-point, dashdotted red line with 15-point, red-edged, white-faced pentagram-shaped markers. For z, use a standard-sized (i.e., default) solid blue line with standard-sized, black-edged, magenta-faced diamond markers.