

ME 2450 Assignment 3

Name: _____

Due: February 15, 2019 before midnight

Collaborators: _____

I declare that the assignment here submitted is original except for source material explicitly acknowledged.

I also acknowledge that I am aware of University policy and regulations on honesty in academic work, and of the disciplinary guidelines and procedures applicable to breaches of such policy and regulations, as contained in the University website.

Name

Date

Signature

Student ID

Score

Exercise Graded: _____

Presentation: _____/2

Technical Content: _____/8

Total:

_____/10

Exercise 1

(4 pts) Consider the following matrices

$$[A] = \begin{bmatrix} 4 & 7 \\ 1 & 2 \\ 5 & 6 \end{bmatrix}, \quad [B] = \begin{bmatrix} 4 & 3 & 7 \\ 1 & 2 & 7 \\ 2 & 0 & 4 \end{bmatrix}, \quad \{C\} = \begin{Bmatrix} 3 \\ 6 \\ 1 \end{Bmatrix}$$

$$[D] = \begin{bmatrix} 9 & 4 & 3 & -6 \\ 2 & -1 & 7 & 5 \end{bmatrix}, \quad [E] = \begin{bmatrix} 1 & 5 & 8 \\ 7 & 2 & 3 \\ 4 & 0 & 6 \end{bmatrix}, \quad [F] = \begin{bmatrix} 3 & 0 & 1 \\ 1 & 7 & 3 \end{bmatrix}, \quad [G] = \begin{bmatrix} 7 & 6 & 4 \end{bmatrix}$$

- What are the dimensions of each matrix?
- Identify the square, column, and row matrices.
- What are the values of the elements: a_{12} , b_{23} , d_{32} , f_{12} , and g_{12} ?
- Perform the following operations:

(a) $[E] + [B]$

(e) $[E] \times [B]$

(b) $[A] \times [F]$

(f) $\{C\}^T$

(c) $[B] - [E]$

(g) $[B] \times [A]$

(d) $7 \times [B]$

(h) $[D]^T$

Exercise 2

(2 pts) Given the system of equations

$$-2.2x_1 + 20x_2 = 240$$

$$-1x_1 + 8.7x_2 = 87$$

- Compute the determinant.
- Solve by the elimination of unknowns.

Exercise 3

(2 pts) Given the equations

$$5x_1 + 1x_2 - 0.5 * x_3 = 13.5$$

$$-6x_1 - 12x_2 + 4x_3 = -123$$

$$2x_1 + 2x_2 + 10x_3 = -43$$

- (a) Solve by naive Gauss elimination. Show all steps of the computation.
- (b) Substitute your results in to the original equations to check your answers.