Answer to GREEN Exam

1. **C**

2. **D**

3. **E**

4. **C**

5. **A**

6. **B**

7. **B**

8. (1) $A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 1 & 4 \\ 5 & 6 & 0 \end{bmatrix}$ (2) $T(\mathbf{u}) = \begin{bmatrix} 2 \\ -2 \\ 17 \end{bmatrix}$ (3) Yes, $\mathbf{x} = \begin{bmatrix} 3 \\ 2 \\ 1 \end{bmatrix}$

9. (1) The REDUCED row echelon form for the matrix A is $\begin{bmatrix} 1 & 0 & -5 & 0 & 7 \\ 0 & 1 & -4 & 0 & 6 \\ 0 & 0 & 0 & 1 & -3 \end{bmatrix}$

(2) A basis for the null space of A is $\left\{ \begin{bmatrix} 5 \\ 4 \\ 1 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} -7 \\ -6 \\ 0 \\ 3 \\ 1 \end{bmatrix} \right\}$, answer may vary!

(3) A basis for the column space of A is $\left\{ \begin{bmatrix} 1 \\ -2 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ 2 \end{bmatrix}, \begin{bmatrix} 1 \\ -2 \\ 1 \end{bmatrix} \right\}$, answer may vary!

10. (1) $det(A) = -2$ (2) $det(2A) = -16$, $det((2A)^{-1}) = -\frac{1}{16}$ (3) $b_{23} = -1$