**Exam 2**  **Mathematics for Computing**  **12–12–2011**

Choose four problems.

1. Find $A^{-1}$ using Gauss-Jordan algorithm.

$$A = \begin{bmatrix} 1 & 1 & 3 \\ 0 & 1 & 2 \\ 1 & 1 & 2 \end{bmatrix}$$

2. Solve the system using Cramer's rule.

$$\begin{array}{rrrr} 2x & +y & -3z & = 5 \\ x & -2y & +z & = 10 \\ 3x & +4y & -2z & = 0 \end{array}$$

3. Evaluate $\det A$.

$$A = \begin{bmatrix} 0 & 2 & 1 & 3 \\ 1 & 0 & -2 & 2 \\ 3 & -1 & 0 & 1 \\ -1 & 1 & 2 & 0 \end{bmatrix}$$

4. Find the eigenvalues and eigenvectors for the matrix $A$.

$$\begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 0 \\ 0 & 1 & 2 \end{bmatrix}$$

5. Compute $A^{10}$ using the diagonalization method,

$$A = \begin{bmatrix} 0 & -2 \\ 1 & 3 \end{bmatrix}$$

given that $\begin{bmatrix} -2 \\ 1 \end{bmatrix}$ and $\begin{bmatrix} -1 \\ 1 \end{bmatrix}$ are two independent eigenvectors.

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