

University of Central Florida

Department of Electrical Engineering and Computer Science

COT 4500 Numerical Calculus

Quiz 3 - Take home quiz

(Due 3/25/2013)

For all exercises show all your work step by step.

1.- Find the invers of matrix A using determinant and cofactors.(20 points)

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

2.- Factor the following matrix into the LU decomposition using LU factorization.(20 points)

$$A = \begin{bmatrix} 2 & -1 & 1 \\ 3 & 3 & 9 \\ 3 & 3 & 5 \end{bmatrix}$$

3.- Solve the following linear system of equations, making use of the LU-factorization of the preceding coefficient matrix.(20 points)

$$\begin{aligned} 2x_1 - x_2 + x_3 &= -1 \\ 3x_1 + 3x_2 + 9x_3 &= 0 \\ 3x_1 + 3x_2 + 5x_3 &= 4 \end{aligned}$$

4.- Determine whether the matrix A is positive definite using Sylvester's criterion. (20 points)

$$A = \begin{bmatrix} 1 & -1 & 0 \\ -1 & 4 & 2 \\ 0 & 2 & 2 \end{bmatrix}$$

5.- Use Cholesky's factorization to find a factorization of the form $A = LL^T$ for the following matrix: (20 points)

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

Submit a pdf document generated with latex.